

Comparative Evaluation of Surface Detail Changes and Compressive Strength of Gypsum Casts and Dies After Immersion in Hypochlorite Solution and Microwave Irradiation – An in Vitro Study

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ABSTRACT

Introduction: Dental impressions contaminated with the microorganisms from patients' saliva and blood can cross infect gypsum casts poured against them and therefore disinfection of gypsum casts through microwave irradiation is currently been used as an alternative to conventional disinfection methods. Aim was to compare the changes in surface detail and compressive strength of gypsum casts brought about by microwave irradiation and immersion in sodium hypochlorite solution respectively.

Material and methods: 60 samples each of Type III and Type IV gypsum were prepared for compressive strength evaluation and divided into 6 groups (control at 1hr, 24hr, microwave irradiation at 1hr, 24hr, and 0.525% sodium hypochlorite with slurry and without slurry immersion at 24hr). 30 samples each were prepared for surface detail evaluation and divided into 3 groups (microwave irradiation at 1hr, 24hr and 0.525% sodium hypochlorite with slurry immersion at 24hr). The compressive strength was evaluated using Instron machine and surface detail evaluated using Motic stereozoom microscope.

Results: Microwave irradiation, if done after one hour of pouring, causes reduction in strength and loss of surface details of Type III and IV gypsum products. The compressive strength of die stone casts immersed in sodium hypochlorite solution with slurry water are increased significantly but there is a significant associated loss of surface details.

Conclusion: In view of the seriousness of the diseases like HIV and hepatitis, it is recommended to use microwave irradiation after 24 hours of air drying to decontaminate the casts prepared by using Type III and Type IV gypsum products till better alternatives are available.

Keywords: gypsum casts, microwave irradiation, sodium hypochlorite, surface details, compressive strength.

INTRODUCTION

Primary and secondary impressions taken in the mouth regularly get contaminated with microorganisms from blood and saliva of patients and that can lead to infections of the casts that are poured from them. Movements of these organisms into dental casts, while setting, have been demonstrated.¹ Some microbes have been shown to remain viable within gypsum cast materials for up to seven days.²

This has led to an increased concern for, and attention to, infection control in dental practice.³ Different methods have been used to disinfect the dental casts. These include immersing the casts in disinfecting solutions, spraying the casts with disinfecting solutions^{4,5} using certain chemicals in gypsum while mixing or using a diestone having disinfectant but it was seen that many physical properties like the setting expansion and setting time were affected by using disinfectant incorporated gypsum. It was observed that physical properties such as setting time and

setting expansion were affected by incorporating disinfectants into gypsum.⁶⁻⁷

Literature has reported the use of microwave irradiation as an alternative.^{8,9} It is found out that this method is effective and practical and eliminates cross contamination via the cast because it can be repeated at every stage as and when required.^{8,10}

Present study was undertaken to evaluate the effect of microwave irradiation on surface details reproducibility and compressive strength of type III and type IV gypsum casts and compare that with that seen after immersion in sodium hypochlorite for decontamination.

MATERIAL AND METHODS

The gypsum products subjected to two methods of disinfection included:

Type III dental stone (Kalstone, Kalabhai Dental P Limited, Mumbai) and

Type IV stone (Kalrock, Kalabhai Dental P Limited, Mumbai).

Die fabrication

An aluminium die according to ADA specification No. 25¹¹ was fabricated to be used as a test die for evaluation of surface detail. The test die had a diameter of 30 mm. 3 parallel lines, x, y, and z, to a depth of 50, 20, and 75 mm respectively, were inscribed for evaluation of surface details. For measurement of compressive strength an aluminium split mould die with guide screws was machine milled. It had 3 compartments for sample preparation, each with 40mm length and 20 mm diameter, according to ANSI /ADA specification No. 25.

Mixing and pouring of gypsum samples

The gypsum products were mixed according to manufacturer's instructions.

The casts were allowed to set for 1 hour at room temperature. The casts that were to be checked after 24 hours were removed from the die and allowed to air dry for 24 hours.

Disinfection using microwave irradiation and sodium hypochlorite immersion

(i) Method for Microwave irradiation: The prepared samples of the microwave irradiation group were kept in the microwave oven and timer set to 3 minutes at full power of 900 Watts and

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2450 MHz (Onida power convection microwave).

(ii) Method for sodium hypochlorite immersion - The samples prepared for the sodium hypochlorite group were immersed in 0.525% solution of freshly prepared sodium hypochlorite in slurry water for 10 minutes in separate boxes which had an air tight lid. The samples were then washed thoroughly under running tap water and dried on table top at room temperature for 24 hours and then subjected to the tests.

Sample preparation for surface detail evaluation

To retain the poured dental stone, a collar was fabricated with elastic material (Impregum Penta Soft Polyether Impression Material; 3M ESPE, St. Paul, Minn) to box the test die.

30 samples, thus prepared for each type of gypsum product were classified into 3 groups as follows:

- Group 1 (Microwave irradiation). Ten samples were tested at 1 hour.
- Group 2 (Microwave irradiation). Ten samples were tested at 24 hours.
- Group 3 (Immersion in 0.525% sodium hypochlorite and slurry solution for 10 min). Ten samples were tested at 24 hours.

Sample preparation for compressive strength evaluation

The split metal mold were filled with dental stone under mechanical vibration as previously described and covered on top and bottom with glass slabs to ensure parallel sides. 120 cylindrical test samples were allowed to set for 1 hour and then retrieved.

The samples prepared were classified into six groups each as follows:

- Group 1 (control). Ten samples each were tested at 1 hour.
- Group 2 (control). Ten samples each were tested at 24 hours.
- Group 3 (Microwave irradiation). Ten samples were tested at 1 hour.
- Group 4 (Microwave irradiation). Ten samples were tested at 24 hours.
- Group 5 (Immersion in 0.525% sodium hypochlorite and slurry solution for 10 min). Ten samples were tested at 24 hours.
- Group 6 (Immersion in 0.525% sodium hypochlorite solution only for 10 min). Ten samples were tested at 24 hours.

Compressive strength evaluation

The compressive strength was tested with an Instron universal testing machine (Instron Corp., Canton, Mass.) with a 10kg load cell at a crosshead speed of 0.05cm/min. The samples were placed on the platform and the load applied. The samples were then crushed between the load and the platform. The results obtained were recorded in MPa (Figure-1).

Surface detail evaluation

The casts were examined under low angle light at X10 magnification with a stereo zoom microscope (Motic® type 102 M Stereozoom microscope, Vancouver, Canada) for the entirety (continuity) of the 0.05-mm-wide line. Revised ANSI/ADA specification No. 25 requires that gypsum products reproduce a line of 0.05 mm in width when tested at a specific consistency. The reproduction of a 0.05-mm-wide line on the test casts was

used for surface detail evaluation. The test casts that did not reproduce the entire length of the 0.05-mm-wide line were discarded. The casts were evaluated based on the graded scoring system with rating values of 1 through 4 (Figure-2). Same investigator performed the evaluation of all the casts.

- Rating 1 indicated a well-defined, sharp continuous line
- Rating 2 indicated a continuous line, but with some loss of sharpness
- Rating 3 indicated a loss of continuity of the line
- Rating 4 indicated complete obliteration of the line.

RESULTS

Observations made on compressive strength of dental stone (Type III gypsum product) and die stone (Type IV gypsum product) were statistically evaluated using independent t test for one hour groups and one way ANOVA multiple comparison Tukey HSD post hoc test for 24 hours groups. For statistical analysis of surface details, chi-square test was used to determine the significance of relationship between the numbers of scores. All computations were conducted in the SPSS (Statistical package for social sciences) software (version 11.5).

Compressive strength

Table-1 shows the readings of compressive strength evaluation after microwave irradiation and hypochlorite immersion of type III and IV dental stone.

Type III stone samples: At one hour interval, the mean compressive strength of microwave irradiation group was significantly lower compared to control group ($p < 0.05$).

At 24 hours, compressive strength values showed no significant difference between control group, microwave irradiated group and hypochlorite immersion group ($p > 0.05$ and $p > 0.05$ respectively). However, a significant difference ($p < 0.05$) in compressive strength was observed between the

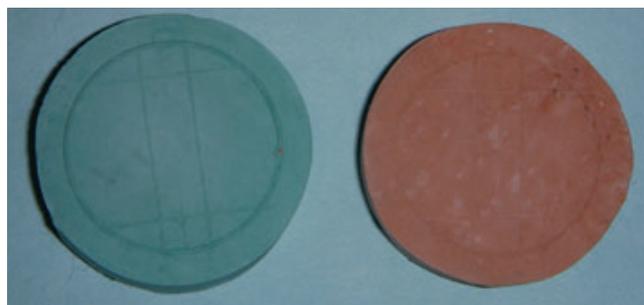


Figure-1: Sample for surface detail evaluation



Figure-2: Surface detail evaluation of prepared samples with Motic type 102 M stereozoom microscope (Motic stereozoom, Canada)

control group and sodium hypochlorite immersion group without slurry water wherein control group exhibited higher compressive strength. Significant difference in compressive strength was observed between microwave irradiated samples and hypochlorite immersion without slurry ($p < 0.05$).

Type IV die stones: At one hour interval, mean compressive strength of control group was significantly higher as compared to microwave irradiation group ($p < 0.05$). Compressive strength values of control group and microwave irradiated samples were not significantly different ($p > 0.05$) at 24 hours. However, samples immersed in hypochlorite solution containing slurry showed superior compressive strength ($p < 0.05$) where as those immersed in hypochlorite solution without any slurry exhibited inferior compressive strength values in contrast to controls ($P < 0.05$)

Samples subjected to microwave irradiation exhibited less resistance to compressive forces in comparison to samples prepared with sodium hypochlorite with slurry water ($p < 0.05$). However, samples prepared with sodium hypochlorite solution (containing no slurry) showed inferior compressive strength as compared to microwave irradiated samples ($p > 0.001$).

Surface details

Summary of results obtained are presented in Table-2. All the samples of type III and IV gypsum in control group exhibited better surface detail reproduction and were able to clearly reproduce a line of 50 μ m thick as indicated by 100% score in score 1.

When microwave irradiated after one hour, Type III samples have shown minimum changes in the surface details as noted from the scores obtained which lie mainly between score 1 and 2. With Type IV, microwave irradiation did not cause any change in the surface detail as noted by 90% score in score 1 with these samples. Both did not show much change in the surface detail when subjected to microwave irradiation after 24 hours as is clear from the 90% and 80% score in score 1 respectively. Greater loss of surface detail was observed with samples when subjected to hypochlorite with slurry water as the scores obtained by most of these samples varied from 3 to 4.

DISCUSSION

Since autoclaving process would be damaging to the dental cast, methods to disinfect dental casts were suggested by American Dental Association (ADA) and Centers for Disease Control and Prevention that included immersion and spraying. It is imperative that all the procedures do not effect the physical properties of the dental casts.¹²

Hypochlorite has held a predominant position as a reliable disinfectant because it has a broad antimicrobial spectrum, rapid bactericidal action, reasonable persistence in treated potable water, ease of use, solubility in water, relative stability both in its concentrated form and at its used dilution, relative nontoxicity to humans at used concentrations, lack of poisonous residues (reduced predominantly to chloride as a result of its oxidizing action on inorganic and organic compounds), action as a deodorizer, colorless, nonflammable, non-staining, and also low cost.

Immersion of the casts in disinfectant solution is effective and is the most widely employed disinfection procedure compared to spray technique. However, it was observed that the immersion process affects the surface quality of the casts/dies. Rudd et al¹³ showed altered surface properties on immersing a stone cast in tap water for 15 min. Kumar et al¹⁴ observed increase in linear dimension and decreased hardness in Type III dental stone specimens when immersed in hypochlorite solution.

Inability to assume that every impression presented to the laboratory has been disinfected completely, inability of the spray technique to completely disinfect the casts and the potentially damaging effects of immersion technique prompted the use of other techniques of disinfecting the dental casts/dies with minimum damage.¹²

Studies have been undertaken to evaluate the disinfection potential of microwave irradiation of dental casts.⁶⁻¹⁰

Microwaves comprise the band of electromagnetic spectrum extending from the frequency of 300 MHz to 3,00,000 MHz. Most commercial microwave ovens operate at 2450 MHz. Microwaves are generated by magnetron and propagated in a strong line along the wave guide(dominant mode). In the materials containing water microwaves are absorbed. However, microwave irradiation was found to cause enlargement of the

Description	1Hr Control	1Hr Microwave	24Hr Control	24Hr Microwave	24Hr Hypochlorite with slurry	24Hr hypochlorite without slurry
Dental Stone						
Mean (MPa)	18.57	15.93	23.95	23.25	25.15	20.08
S.D	1.16	3.03	2.18	1.34	1.09	2.05
Die Stone						
Mean (MPa)	24.04	16.80	33.81	33.49	38.24	29.43
S.D	3.04	1.45	1.86	1.75	1.52	3.93

Table-1: Readings of compressive strength evaluation after microwave irradiation and hypochlorite immersion of dental stone and die stone

Description	Dental Stone				Die stone			
	1	2	3	4	1	2	3	4
1Hr Control	10	-	-	-	10	-	-	-
1Hr Microwave	4	5	1	-	9	1	-	-
24Hr Control	10	-	-	-	10	-	-	-
24Hr Microwave	9	1	-	-	8	2	-	-
24Hr Hypochlorite with slurry	-	3	4	3	-	3	4	3

Table-2: Scores for surface detail evaluated after microwave irradiation and hypochlorite immersion of the dental stone and die stone

pores on the surface of the cast because of rapid loss of steam which may have an influence on the mechanical characteristics and reproducibility of the surface details.¹⁵

Since fabrication of a dental prosthesis requires the dental cast to undergo various laboratory procedures, the most important are the strength of the dental cast and its ability to retain the surface details.

Effect of microwave irradiation on compressive strength

It was observed that both Type III and IV gypsum had a decreased compressive strength when subjected to microwave irradiation at one hour. This decrease was more prominent in Type IV as compared to that seen for Type III which is due to the differences in the crystal shape, density, intermeshing and entanglement of dehydrate crystals in the gypsum tested. In Type III, the number of crystal nuclei formed is much smaller and the amount of intermeshing and entanglement is less. Whereas formation of a dense mass with less amount of porosity is seen in type IV. When Type IV gypsum casts are subjected to microwave irradiation, excess water used during mixing, although less compared to Type III, forms steam and creates cracks or porosities while leaving the surface. Because structure of Type IV is dense, the escape of steam creates stress in the material which probably leads to formation of minor cracks in the material. Formation of porosities or micro cracks could be the reason why it failed at low stress values.

Type III gypsum is not as dense and allows easy escape of steam and there by showing little change in compressive strength. Compressive strength of control samples measured at 24 hours is not significantly different from the compressive strength of microwave irradiated specimens. This is understood as most of the excess water would have evaporated from the material with 24 hours. It has also been suggested that microwaves should not be used to disinfect wet casts.

In a study conducted by Leubke and Schneider,¹⁵ it was observed that at 2 hours, there is no significant difference in compressive strength of Type III dental stone dried in microwave oven when compared with the air dried stone.

Leubke and Schneider¹⁵ also observed that die stones were physically changed by microwave drying because of the appearance of cracks and holes on the surface.

Leung RL et al¹ advocated setting the oven at lowest power level. In another study, highest power level resulted in a decrease in the compressive strength of Type IV die stone was found by Tuncer et al.¹⁶

Effect of microwave irradiation on surface detail reproduction

Microwave irradiation of samples at the end of one hour resulted in changes in surface details in about 60% samples. However, this effect was not significant when the samples were irradiated with microwaves at the end of 24 hours. The loss of surface details at one hour was due porosity or micro cracks formed by the steam during microwave irradiation.

Effect of hypochlorite and slurry on compressive strength

The use of clear slurry water (saturated calcium sulphate) has been used for soaking dental casts with no damage to the surface.¹⁷ In the present study, the effect of sodium hypochlorite disinfectant was evaluated in the presence or absence of slurry water on the compressive strength.

At 24 hours, immersion in sodium hypochlorite (0.525%) with slurry water did not decrease compressive strength of type III samples significantly. Instead, for Type IV stone there was a significant increase in compressive strength. Immersion in sodium hypochlorite (0.525%) without slurry water decreased compressive strengths significantly, more in comparison to control specimens that were air dried. Our observation support what Sarma and Neiman¹⁸ had noted.

Although sodium hypochlorite immersion disinfects the cast, the effect it has on the physical properties is a concern. The assumption is that sodium ions from the hypochlorite interfere with structure and strength of the gypsum which contains calcium in its structure. Presence of slurry may not allow any further degradation or solubilisation of samples.

Ivonovski et al¹⁹ reported a decrease in compressive strength with the addition of sodium hypochlorite to the stone during mixing. Abdelaziz et al²⁰ found a reduction in compressive and tensile strengths both, in Type III and IV when combined with sodium hypochlorite. However, same materials when immersed in same concentration of hypochlorite solution containing slurry, the changes in the compressive strength were not significant.

Effect of hypochlorite and slurry on the surface details

Immersion in hypochlorite solution with slurry caused significant loss of surface detail which can be due to the ability of sodium hypochlorite to dissolve the surface of the cast materials during immersion. During the setting process, fine crystals of gypsum precipitate are left behind to anchor larger crystals as the last molecules of water leave the surface of the dental casts. When water or any solution is reintroduced onto the surface, the small crystals are the first ones to dissolve. This explains the loss of surface details after immersion disinfection.²¹

Our observations are contrary to the study done by Bass et al¹⁷ who compared the effects of immersion disinfection of casts in a mixture of sodium hypochlorite and slurry water for 30-minute and 1-hour intervals. They reported no difference in the quality of the cast surface when submerged in the disinfectant slurry and slurry water.

CONCLUSION

It can be concluded that microwave irradiation gypsum products after one hour of pouring reduced the strength but not significant at the end of 24 hours ($p > 0.05$).

Considering the consequences of cross infection of the diseases like HIV and hepatitis, we recommend the use of microwave irradiation after 24 hours of air drying to decontaminate the casts and dies till better alternatives are available.

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Comparison of the Effect of Tamsulosin Versus Combination of Tamsulosin and Oxybutynin in the Medical Management of Patients with Benign Prostatic Hyperplasia: A Randomised Double Blind Placebo Controlled Study

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ABSTRACT

Introduction: Although alpha adrenergic antagonist have long been considered first line therapy for male lower urinary tract symptoms, many patients have persistent storage symptoms and do not reach their treatment goal. Study was done to compare the efficacy and tolerability of combination of Tamsulosin and Oxybutynin versus Tamsulosin alone in the patients with BPH-LUTS complex.

Material and methods: Between December 2008 and July 2010 at our institute 80 consenting patients of BPH –LUTS complex were selected for the trial. The trial was conducted on an OPD basis and patients were selected after meeting the inclusion criteria other than those coming under the exclusion criteria. Eligibility criteria were defined as International prostatic symptom score(IPSS) ≥ 13 , IPSS storage symptoms ≥ 8 , Peak flow rate(Qmax) ≥ 4 ml/s, PVR ≤ 200 ml, Voided volume ≥ 150 ml. Patients were randomized to receive tamsulosin (0.4 mg/d) with either oxybutynin (10 mg/d) or placebo for 12 weeks. Appropriate statistical tests like paired t test and analysis of covariance were used to analyze the data.

Results: Tamsulosin combined with extended-release Oxybutynin resulted in significantly greater improvement in total IPSS compared with Tamsulosin and placebo after 4(P=0.003), 8 (P=.001) and 12 (P=.001) weeks of treatment, and improved IPSS for storage and quality of life at all assessment points (P<0.001). The mean increase in post void residual urine volume was significantly higher in the combination therapy group (107.16 vs. 64.12ml)

Conclusion: In men with substantial storage symptoms, combination therapy with Tamsulosin and Oxybutynin demonstrated greater efficacy than and comparable safety and tolerability to Tamsulosin monotherapy.

Keywords: BPH, LUTS, combination therapy, Tamsulosin, Oxybutynin

pressure as the correlation between the urinary symptom and urodynamic observation is at best weak. The LUTS-BPH complex consists of both voiding and storage symptoms that may overlap with overactive bladder symptoms. The constellation of LUTS comprises storage (frequency, nocturia, urgency, urge incontinence) and voiding (slow stream, splitting or spraying, intermittent stream, hesitancy, straining) components⁶. The voiding symptoms are classically related to the BPE and more than 50% of the men have storage symptom also. The storage symptoms of BPH overlap with the symptom of another prevalent age related condition, overactive bladder (OAB). About 30% of men aged 50–80 years have either moderate or severe LUTS¹. Half of the men with LUTS-BPH complex will have a pattern of spectrum which will overlap with the symptoms of over active bladder². The ICS defines OAB as a syndrome characterized by urgency with or without urge incontinence, usually with frequency and nocturia³. The prevalence of both OAB and LUTS increases with age. LUTS, BPH and OAB are all causally related but the underlying mechanism linking them and the extent of the association is poorly understood. OAB coexists with BOO in about 66% of cases¹² and about 30% of the men with OAB have failure to resolve their symptom even after the correction of the BOO⁴. Bladder wall hypertrophy and progressive neuronal degeneration consequent upon functional overload due to BPH is thought to play the central role in the development of storage symptom and overactive bladder⁹. It has also been shown that alteration in cytoskeletal proteins, extracellular matrix, mitochondrial function, and development of denervation supersensitivity to the acetylcholine might explain the causes of bladder overactivity¹⁰. A straight forward association between BPH, LUTS and OAB however cannot always be established⁷. OAB has a significant adverse impact on the quality of life in the functional and social domains⁵. The American Urological Association Symptoms Index (AUASI) and the International Prostate Symptom Index Score (IPSS) are the most widely used instruments to capture severity of LUTS¹¹.

INTRODUCTION

Benign Prostatic Hyperplasia (BPH) is a common urological problem of the geriatric population and Lower urinary tract symptoms (LUTS) are commonly associated with benign prostatic hyperplasia (BPH). LUTS terminology was initially proposed by Abrams in 1994 and accepted by the 5th International consultation on Benign prostatic Hyperplasia (BPH) to replace the previous terms of “prostatism”, “symptomatic BPH” and “clinical BPH”. The same consultation recommended the use of the terms “benign prostatic hyperplasia” (BPH) only in the case of histological confirmation and “benign prostatic enlargement”(BPE) when such pathologic data were lacking. Bladder outlet obstruction (BOO) was proposed as an urodynamic concept of reduced flow rate with increased bladder

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Even though there is a significant overlap in the symptom and prevalence of BPH and OAB but the treatment varies greatly. The current recommendation for the initial treatment of BPH-LUTS complex is an alpha antagonist alone or with 5 α reductase inhibitors¹³ and invasive measures reserved for patients who are not candidates for medical management or respond poorly to it¹⁴. Tamsulosin is a third generation α_{1A} -adrenoreceptor blocker which is a safe and efficacious drug for the treatment of BPH with fewer documented side effects than the other available alpha blocking medications¹⁵. The efficacy of OAB on the other hand treated with anticholinergics in the women and non obstructed men is established. Historically there were theoretical concerns in the use of anticholinergics in BPH primarily because of concerns of precipitations of acute urinary retention and increase in the post void residual urine. Consequent upon the concerns, current practice guidelines (AUA,BAUS and EAU) do not recommend the use of anticholinergics in men with LUTS due to BPH. Nevertheless as a significant percentage of patients on medical treatment with alpha blocker do not achieve their treatment goal, the clinicians have implemented the use of anticholinergics in their clinical practice even in the absence of any concrete data. However, recently several trials have been conducted to assess the utility of anticholinergics in BPH, either as a single agent or in combination with other medication classes. This study was also designed and aimed at assessing the role of commonly available anticholinergic "Oxybutynin" in combination with "Tamsulosin" in the medical management of BPH. The main objective of the study was to compare the decrease in severity of LUTS and individually the storage and voiding symptoms after use of Tamsulosin versus combination of Tamsulosin and oxybutynin.

MATERIAL AND METHODS

This double blind randomized placebo controlled trial enrolled

80 men diagnosed with BPH-LUTS complex between December 2008 and July 2010 at department of urology, JIPMER, puducherry. The trial was conducted on an OPD basis and patients were selected after meeting the inclusion criteria other than those coming under the exclusion criteria. Eligibility criteria were defined as men ≥ 45 years with International prostatic symptom score (table-1) (IPSS) ≥ 13 , IPSS storage symptoms ≥ 8 , Peak flow rate (Qmax) ≥ 4 ml/s, 4, PVR ≤ 200 ml, Voided volume ≥ 150 ml. Exclusion criteria was defined as history of urinary retention, symptomatic urinary tract infection, bladder or prostate cancer, PSA ≥ 4 ng/dl, previous lower urinary tract infection, use of sympathomimetic drugs in the last 4 months, angle closure glaucoma, absolute indication for prostatectomy, serious medical comorbidities and allergy to tamsulosin or oxybutynin. This study was approved by Institutional review board and Ethics committee and all patients provided written informed consent. All patients were randomized into two groups using random number generator software (figure-1). All patient identification numbers and randomization numbers were assigned sequentially in ascending order beginning with the lowest number available. All study medication and placebo were similar looking and smelling and both patients and investigator was blinded to the results. All patients were screened one week before inclusion with complete history and physical examination, USG-KUB, Uroflowmetry, PVR assessment, serum PSA, urine analysis, urine culture, IPSS Questionnaire and given Tamsulosin 0.4 mg OD. At randomization (Visit2) the patients were required to receive in addition to tamsulosin either extended release Oxybutynin 10mg/day or placebo. Treatment continued for 12 weeks with assessment of efficacy and safety by administration of IPSS questionnaire, SS questionnaire, GRA Questionnaire, SPI Questionnaire and QOL questionnaire at 4,8 and 12 weeks.

	None	Less than 1 time in 5	Less than half the time	About half the time	More than half the time	Almost always
Over the past month, how often you had the sensation of not emptying your bladder completely after you finished urinating?	0	1	2	3	4	5
Over the past month, how often have you had to urinate less than two after you finished urinating?	0	1	2	3	4	5
Over the past month, how often you you stopped and started again several times when you urinated?	0	1	2	3	4	5
Over the past month, how often you found it difficult to postpone urination?	0	1	2	3	4	5
Over the past month, how often have you had a weak stream?	0	1	2	3	4	5
Over the past month, how often you had to push or strain to begin the urination?	0	1	2	3	4	5
	None	1 time	2 times	3 times	4 times	5 times or more
Over the past month, how many times did you most typically get up to urinate from the time you went to bed at night until the time you got up in the time you got up in the morning?	0	1	2	3	4	5
Total symptom score						
Score: 0-7=Mild, 8-19= Moderate, 20-35= severe						

Table-1: International Prostatic Symptom Score as adapted from J Urol¹⁶

End Points: The primary efficacy end point was the change in IPSS from the baseline to the final visit at 12 weeks or the last observation carried forward (LOCF). The secondary end points were assessment of subscore (comprising question 2, 4 and 7) and Quality of life assessment (QOL) component of the IPSS as well as assessment of symptom problem index(SPI)¹⁷ to determine the degree of bother(from 0 =“no bother” to 4 = “a big problem”) of the patient and Global response assessment (GRA) to determine the patients perception of the overall improvement (Markedly worse=0 to markedly better=7). IPSS subscore, SPI assessment were performed at visits 2 through 5 and GRA assessment administered at 3,4 and 5. Safety was assessed by history and physical examination at each visit and adverse effects were documented throughout the study. We hypothesized that patients receiving Oxybutynin with Tamsulosin could perceive greater treatment than men who received placebo.

STATISTICAL ANALYSIS

The sample size of the study was calculated using SPSS software keeping the power at 80%, two tailed α level of 0.05, true response rate to be 80% and an attrition rate of 10%. Intention to treat population (ITT) was defined as all randomized patients who received at least one dose of the study drug and had at least one post randomization safety evaluation and ITT population was used to assess primary and secondary end points. Treatment effects from primary and secondary end points were assessed using an analysis of covariance model with the baseline as a covariate and other values as qualitative factors. Missing observations were analyzed by last observations carried forward (LOCF).

RESULTS

A total of 80 patients received at least one dose of the study medication and had at least one post randomization evaluation and formed the intention to treat population. 40 of these patients received tamsulosin with placebo and the other 40 patients received tamsulosin with oxybutynin. 4 patients were lost to follow up and 3 patients discontinued of the study two of whom due to development of acute urinary retention and one due to lack of efficacy. Treatment groups were well matched in age, prostate size, PSA, PFR, PVR, and symptom severity at baseline (Table-2).

The addition of extended release Oxybutynin to the tamsulosin resulted in progressive improvement in the symptoms from the base line in comparison to the placebo group (Table-2). At 12 weeks the assessment of primary efficacy end point IPSS revealed mean \pm S.D of 7.24 \pm 4.27 (from the baseline of 18.4 \pm 5.13) for the Oxybutynin group and 13.27 \pm 4.16(from the baseline of 17.20 \pm 4.83) for the placebo group. There was a statistically significant decrease in the IPSS evident at 4 weeks in the Oxybutynin group which was sustained at 8 and 12 weeks. Significant improvement in the IPSS subscore, SPI score and QOL score were noted at all assessment points. The improvement as indexed by GRA was numerically greater at 4 weeks and became statistically significant at 8 weeks which was sustained at 12 weeks. There was no decrease in the PFR in the Oxybutynin group compared to the placebo group at all assessment points. At 12 weeks the mean \pm SD of PFR (ml/sec)in the oxybutynin group was 12.99 \pm 4.85 compared to

characteristics	Test group (N=40)	control group(N=40)	P value
Age(y)	65.95 \pm 6.72	67.53 \pm 7.29	0.71
Prostate vol.(ml)	34.58 \pm 12.42	35.19 \pm 11.94	0.56
IPSS	26.78 \pm 6.76	23.03 \pm 6.54	0.70
IPSS-SS	14.03 \pm 2.17	13.18 \pm 2.28	0.06
PFR	9.40 \pm 5.29	11.40 \pm 4.22	0.32
PVR	71.77 \pm 48.14	62.23 \pm 46.86	0.72
PSA	2.32 \pm 1.17	2.10 \pm 1.17	0.73

†Continuous variables are expressed as mean \pm SD. IPSS = International Prostate; Symptom Score; IPSS- SS= IPSS sub score; LUTS = lower urinary tract symptoms; PFR = peak flow rate; PVR = postvoid residual

Table-2: Baseline characteristics of enrolled patients¹

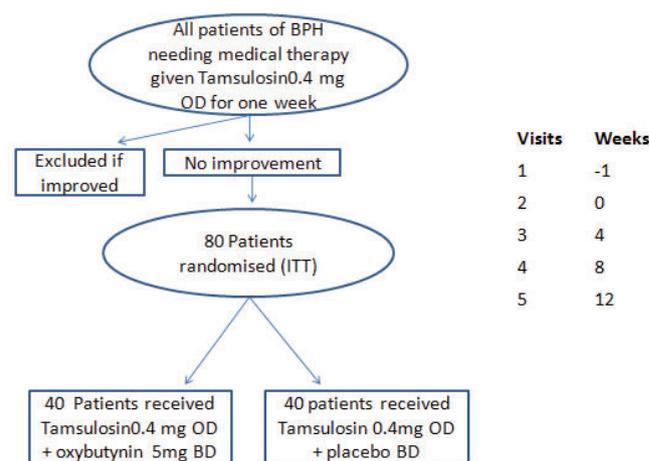


Figure-1: Study design and time line

13.42 \pm 3.94 in the placebo group which was statistically not significant (P value=0.67). There was a statistically significant increase in the PVR at 4,8 and 12 weeks and the mean \pm SD of the PVR at 12 weeks was 110.13 \pm 60.3ml from the baseline of 71.90 \pm 54.69ml in the Oxybutynin group(P value<0.01):the corresponding change for the placebo group was 60.34 \pm 9.92 from 42.99 \pm 6.97ml.

Safety and tolerability: The patients taking Oxybutynin reported dry mouth in 35%(14/40), dry mouth with constipation in 2.5% (1/40) and dizziness in 5% (2/40). One patient in the Oxybutynin group discontinued the study due to precipitation of acute urinary retention (2.5%). He was catheterized for 7 days and later voided successfully on tamsulosin. The patients in placebo group reported tiredness and dizziness in 2.5% each (1/40) (table-3).

DISCUSSION

Though in recent times the importance of antimuscarinics have been realized by several studies but the three meta analysis¹⁸⁻²⁰ published till date identified only 5 RCT²¹⁻²⁶ concerning the role of combination therapy in the patients with BPH and only one RCT(MacDiarmid¹⁸) evaluating role of Oxybutynin and tamsulosin in BPH. One case series was reported by Lim¹⁹ evaluating oxybutynin with terazosin in 89 cases of BPH. Though most of the RCT emphasize the safety and efficacy of the antimuscarinics in BPH but there is heterogeneity in the study methodology emphasizing the need for further studies. All the RCT on combination therapy with antimuscarinics

Patient visit	IPSS		IPSS-SS		IPSS-QOL		SPI- Total		GRA Total	
	Score	P value	Score	P value	score	P value	score	P value	score	P value
Baseline		NA		NA		NA		NA		
Oxybutynin group	18.4±5.13		10.93±3.30		5.70±0.64		3.78±0.48			
Placebo group	17.20±4.83		10.44±2.85		5.55±0.67		2.33±0.83			
Week 4		0.03		<0.01		<0.01		<0.01		0.63
Oxybutynin group	11.46±5.44		6.31±3.56		3.67±0.86		2.33±0.83		1.59±0.81	
Placebo group	14.90±4.54		9.40±2.64		4.58±0.67		2.98±0.53		1.68±0.76	
Week 8		<0.01		<0.01		<0.01		<0.01		0.002
Oxybutynin group	9.03±4.94		5.24±2.63		2.37±1.28		1.66±0.90		3.11±1.42	
Placebo group	14.18±4.43		8.95±2.52		4.30±0.68		2.73±0.64		2.28±0.78	
Week 12		<0.01		<0.01		<0.01		<0.01		<0.01
Oxybutynin group	7.24±4.27		4.41±2.82		1.84±1.28		1.24±0.83		4.49±1.40	
Placebo group	13.27±4.16		8.41±2.16		4.11±0.63		2.59±0.59		2.70±0.77	

[#]Values expressed are mean ± SD; NA= Not applicable; QOL = quality of life; SPI = Symptom Problem Index, [§]P values were computed using analysis of covariance with baseline values as the variate, [†]Based on Intention to treat analysis(ITT) and last observation carried forward(LOCF)

Table-3: Effects of Oxybutynin on primary and secondary efficacy outcome and comparison of changes from baseline at Weeks 4, 8, and 12 (LOCF)[†]

have been conducted using tamsulosin except for Lee et al²³ who used Doxazosin and reported comparable results in 211 patients. AUA guidelines recommend any of the 4 drugs tamsulosin, alfuzosin, terazosin and prazosin as an option in medical management of BPH with equal efficacy. We selected tamsulosin for trial on the basis of widespread use and better safety profile. Even though only one RCT has used oxybutynin for the trial on BPH¹⁸ we selected the drug as it is in common use and others have reported similar efficacy among non selective and M₃ selective antimuscarinic darifenacin²⁷ in OAB but the data as to the superiority of latter over former in BPH is lacking. Long acting Oxybutynin has been shown to have lesser adverse effects and equal efficacy justifying its selection for the trial. Lee et al²³ Asthanapoulos et al²⁴ and Abrams et al²⁵ used urodynamics both as an entry protocol and in follow-up after use of tolterodine to make the results objective but had no data on patient symptom. We chose not to use urodynamic studies with the belief that treatment of patients based on symptom end point would improve the generalizability of the results to the clinical practice as the symptoms represent the ultimate treatment goal. Moreover patient reported outcome are particularly important for evaluating the therapeutic benefit of pharmacotherapies that do not cure chronic condition. Though some studies have used tamsulosin for 4 weeks²¹ before randomization but this study like that by Asthanapaoulas et al²⁴ required the patients to take tamsulosin only for 1 week before randomization assuming that any further change would occur in both the groups negating any impact on the result. SPI and GRA²⁹ was used in addition to the IPSS for efficacy end points as IPSS alone does not include an item for urgency urinary incontinence and does not allow for quantification of urinary frequency or degree of urgency. Steven AK et al²⁶ used perception of treatment benefit question^{30,31} (similar to GRA) with 5 point urgency rating scale³¹ as primary efficacy end point and IPSS as secondary efficacy end point along with bladder diaries for assessing response on the OAB component of BPH symptom complex. They reported benefit of 80% (P value<0.01) in the combination arm of Tamsulosin plus tolterodine. This study also brought out similar improvement in IPSS and IPSS-subscore(P value<0.01).Improvements in

QOL, SPI and GRA Questionnaire(p value<0.01) corroborates with the other study by Macdiarmid et al²¹ (P value<0.01). There was no significant change in PFR and a statistically significant but clinically non significant increase in the PVR as also noted in other studies^{21,26}.The incidence of acute urinary retention of 2.5%is acceptable as noted in the metaanalysis¹⁸. Dry mouth was the most common side effect in 35% which is acceptable^{19,20}.

CONCLUSIONS

Monotherapy with Tamsulosin or antimuscarinics do not help some men with BPH. Combination of Tamsulosin and extended release Oxybutynin at 10mg/d is a safe and efficacious option for the patients with BPH who have severe storage symptoms or who fail medical monotherapy. It would be prudent however to restrict the use to those who have severe storage symptoms with mild to moderate grade BOO. Those men with increased risk of urinary retention should be monitored particularly within 4 weeks of starting therapy. Well designed studies are needed to assess the long term effects of antimuscarinics in BPH-LUTS complex and to determine safe limits of PVR and PFR before starting therapy. Further studies are also needed to evaluate the additional benefit, if any, of uroselective antimuscarinics like Darifenacin and Solifenacin in combination with alpha blockers in the treatment spectrum of BPH-LUTS complex.

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Does Intravenous Low Dose Dexmedetomidine Supplementation has Beneficial Effects on Spinal Anaesthesia?

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ABSTRACT

Introduction: Dexmedetomidine has been reported to potentiate the effects of intrathecal local anaesthetics. This study was conducted to evaluate the effects of intravenous dexmedetomidine on spinal bupivacaine anesthesia.

Material and Methods: 80 female patients with ASA grade I/II aged 35-55 yrs. undergoing abdominal hysterectomy under spinal anaesthesia were randomized into two groups of 40 each. Before spinal anesthesia patients in group D received a loading dose of 0.5 µg/kg IV Dexmedetomidine over 10 min. by infusion pump followed by a maintenance dose of 0.5 µg/kg/hr till completion of the surgery, while patients in group C received the same calculated volume of normal saline. Time for onset of sensory and motor blockade, time to reach peak sensory level, time taken for two segment regression and maximum sensory level, Ramsay sedation score, duration of analgesia and haemodynamic parameters were recorded and statistically analyzed.

Results: Onset of sensory block in group D was 1.325 ± 0.474 min and 1.65 ± 0.483 min in group C. Time for two segment regression was 130.87 ± 11.76 min in group D and 105.38 ± 10.22 min in group C. Time for return of modified Bromage score to 0 in group D was 216.25 ± 19.38 min and 161.75 ± 18.73 min in group C. Total analgesia duration was 257.25 ± 15.18 min in group D and 195.63 ± 12.87 min in group C.

Conclusion; Intravenous Dexmedetomidine prolonged spinal bupivacaine sensory and motor blockade and provided satisfactory arousable sedation. It can cause transient, easily treatable bradycardia and hypotension.

Keywords: Intravenous, Dexmedetomidine Supplementation, Spinal Anaesthesia?

INTRODUCTION

Numerous trials of different techniques and drugs for postoperative pain control of abdominal surgeries has been conducted but none of them has ever emerged with overwhelming advantage. Popular and common anaesthetic technique used for abdominal hysterectomy is Spinal anaesthesia which is best to control intraoperative pain. Many drugs are used intrathecally like epinephrine, fentanyl, buprenorphine to prolong the duration of sensory block and achieve longer perioperative analgesia.¹ Clonidine and dexmedetomidine have been used intrathecally,² and also intravenously to prolong the duration of spinal anaesthesia using various local anesthetics.³⁻⁶ apart from sedation and analgesia they also decrease the stress response to surgery and anesthesia. They produce sedation and anxiolysis by binding to presynaptic α₂ receptors in locus ceruleus.^{7,8} Postsynaptic activation in CNS inhibits sympathetic activity thus decreasing heart rate and blood pressure. At the spinal cord stimulation of α₂ receptors at the substantia gelatinosa of the dorsal horn leads to inhibition of firing of the nociceptive neurones and inhibition of release of substance P contributing

to their analgesic action. The most accepted mechanism of this action is by release of nitrous Oxide. Dexmedetomidine is more suitable adjuvant to spinal anesthesia compared to clonidine as it has more sedative and analgesic effect due to its more relative α₂ A receptor agonist activity.

Studies evaluating the efficacy of dexmedetomidine in prolonging the duration of subarachnoid block have used 1µg bolus followed by infusion.⁹⁻¹² We hypothesized that dexmedetomidine might have role in prolongation of SAB with 0.5% heavy bupivacaine if given small IV loading dose followed by infusion. Hence, present study was designed to evaluate the effects of intravenous dexmedetomidine 0.5µg/kg followed by its infusion, on the SAB block characteristics, its duration and level of sedation in patients undergoing open abdominal hysterectomy.

MATERIAL AND METHODS

After Institutional ethical committee approval, prospective, randomized, double blinded clinical comparative study was designed.

Sample Size: Based on previous study¹⁵ the data on comparison of sensory and motor parameter was referred. The standardized effect size ranged between 0.2 to 0.6 for various parameter group, we. An average effect size of approximately 0.65 was used to determine the sample size. VAS ≥3 a power of 0.8 and significance level of 0.05, the estimated per group sample size was 39. We included 40 patients in each group for better validation of results.

Eighty female patients, aged 35-55 yrs. ASA grade I/II, undergoing open abdominal hysterectomy were randomly divided into two groups of 40 in each group by a computer generated randomization table. Group D=Received single bolus iv dose of dexmedetomidine (0.5mcg/kg in 100 ml with NS over 10 min as a loading dose, before instituting SAB) as premedication. Group C=Received 100 ml normal saline over 10 minutes as pre-medication A study anaesthetist (Person A) prepared control and study group drugs, Person B did intraoperative and post operative monitoring i.e. heart rate, mean arterial pressure, sensory level, pain (VAS score), motor blockade (modified Bromage scale) and level of sedation (Ramsay Sedation Score). Person C administered (intravenous

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and intrathecal) to the patients. Person A and C were constant throughout the study. Person B, C and the patient were unaware of the drug injected to enable double-blinding.

Exclusion criteria included Use of any opioids or sedative medications in the week prior to surgery, history of alcohol or drug abuse, contraindication for SAB, morbidly obese, patients on antihypertensive therapy, with diabetes or renal dysfunction, with allergy to amide type of local anesthetics. All patients underwent a thorough preanaesthetic check up along with routine investigations like Haemogram, Urine examination, RBS, Chest X-Ray, ECG. If required additional investigations were carried out.

A written informed consent was taken. Patients were explained about plan of anaesthetic procedure, Visual analogue scale (VAS) was taught and how to express the degree of pain on the scale. On the day of surgery patients did not receive any premedication. After intravenous insertion of 18-G cannula in the operating room, before induction of SAB, all patients were preloaded with Ringer's lactate 10ml/kg. A single dose of dexmedetomidine $0.5\mu\text{gkg}^{-1}$ was administered i.v. in 100 ml normal saline over 10 min to group D. The same amount of saline was given to the patient in the group C. After SAB, supplemental dexmedetomidine infusion was continued in group D using infusion pump at the rate of 0.5mcg/kg/hr throughout the surgery. Same amount of normal saline was administered in control group in addition to routine requirement of IV fluid. Monitoring included three lead ECG in Std. lead II, Non invasive Blood pressure, Respiratory rate, Pulse oximetry for peripheral oxygen saturation (SpO₂), Capnography for end-tidal carbon dioxide concentration (Et-CO₂) were recorded. The base line Heart rate, Blood pressure, SpO₂, Respiratory rate, Et-CO₂ was recorded at prior to premedication, after premedication, then after SAB, at every 1 minute interval for 5 minutes; then every 5 minutes interval for 25 minutes; then every 15 minutes interval till the procedure is completed and finally every 30 min in postoperative period. Under strict aseptic precautions, lumbar puncture was performed with 23 gauge Quincke needle at L3/4 or L2/3 interspace with patients in lateral position through midline approach with the bevel point tip upward. SAB was given with 15mg of 0.5% hyperbaric bupivacaine injected after free flow of clear CSF. Patient was made to lie down supine immediately on the OT table without any tilt. Surgery was performed after confirmation of successful blockade with proper height of analgesia. All patients received oxygen at 2litres per min via a binasal prongs throughout the procedure. Arterial oxygen saturation was registered continuously by pulse oximetry. Fluid administration was continued intraoperatively with Ringer's lactate. After SAB, in addition to regular IV fluid supplementation, all the patients in Group D was received maintenance infusion of dexmedetomidine at rate of 0.5mcg/kg/hr and same rate of infusion of saline was administered in group C, throughout the duration of surgery, in same way.

Hypotension (MAP \leq 25% from baseline or systolic pressure $<$ 90mm of Hg) was treated with Inj ephedrine 6 mg IV and bolous administration of 250 ml of ringer lactate over 10min were repeated if blood pressure remained low. Bradycardia (HR $<$ 25% from baseline or HR $<$ 50 beats/min) was treated with inj atropine 0.6 mg IV. Respiratory depression was defined as an EtCO₂ $>$ 50 mm Hg or RR $<$ 10 breaths min.⁻¹

The onset of sensory anaesthesia was tested with 23 G hypodermic needle by pinprick. Sensory anaesthesia was defined as the loss of sharp sensation to pinprick bilaterally in the midclavicular line. Time taken for onset of sensory anaesthesia at L1 was recorded and tested for every minute till the peak level was achieved. Peak sensory level defined as the sensory level which remains same for three reading after every 1 min of interval. Peak sensory level and time to achieve peak sensory level was recorded. Two dermatomal regressions from the maximum level and regression to L1 level was noted. Sensory blockade was assessed every minute for first 10 minute thereafter every 15 min during surgery and every 30 min postoperatively. The time for total duration of analgesia (time from administration of SAB until the first request of rescue analgesia at VAS \geq 3) was calculated. All duration was calculated considering the time of spinal injection as time 0. Motor blockade was determined using Modified Bromage scale.¹³ Motor blockade was assessed every 2 min after SAB till complete motor block was achieved and every 30 min in PACU. The onset of motor blockade (Time taken for motor blockade to reach Modified Bromage Scale 3) and duration of motor blockade (Regression of motor blockade to Modified Bromage scale 0) was noted. Duration of analgesia was assessed by Visual Analogue Scale (VAS) postoperatively till request of first rescue analgesic. Total duration of analgesia was defined as time from administration of SAB to first request of rescue analgesia. Injection diclofenac 75mg intramuscular was used as rescue analgesic.

The level of sedation was evaluated both intra and post operatively every 15 min thought the study period using Ramsay sedation score¹⁴ (RSS) as shown below till the patient was discharged from PACU. Grade 1. Anxious or restless or both. Grade 2. Cooperative, orientated and tranquil. Grade 3. Responding to commands. Grad 4. Brisk response to stimulus. Grade 5. Sluggish response to stimulus. Grade 6. No response to stimulus

Adverse effect such as nausea, vomiting, shivering, hypotension, bradycardia were observed and treated accordingly.

STATISTICAL ANALYSIS

The anthropometric parameters like height, weight and BMI, sedation score, EtCo₂ at each stage, mean of the vital parameters and time for motor bromage score 3 were compared between two groups using t-test for independent samples. The maximum sensory level between the groups was compared using Wilcoxon rank sum test. The proportion of patients in two groups with peak sensory levels for T6 and T8 was tested for statistical significance using Chi-square test. The analysis was performed using SPSS 20.0 (SPSS Inc.) software and the significance level was set at 5%. P value of $<$ 0.05 was considered as significant.

RESULTS

The two groups were statistically similar to each other with respect to age, weight, height, BMI, duration of hysterectomy (Table-1). Onset of sensory blockade at L1 in group D was 1.325 ± 0.474 minutes while it was 1.65 ± 0.483 minutes in group C. This difference was statistically significant (p -value 0.0033). There was no significant difference in onset of motor blockade, as it was 4.65 ± 0.948 min in group D and 4.70 ± 0.966 min in group C (p-value 0.815). Maximum sensory level

(Median) achieved was statistically higher in group D (6.75 ± 0.981) than in group C (7.55 ± 0.8458), $p < 0.0002$. Time to two segment regression was longer in group D (130.87 ± 11.76 min.) than (105.38 ± 10.22 min) in group C, $P < 0.0001$. Time for first rescue analgesic was longer in group D (257.25 ± 15.18 min) than (195.63 ± 12.87 min) in group C. Duration of motor block was prolonged in group D (216.25 ± 19.38 min) as compared to group C (161.75 ± 18.73 min) $p < 0.0001$ (table-3).

DISCUSSION

The results of our study indicate that intravenous dexmedetomidine premedication hastened the onset of sensory block, could be due to α -2 receptor activation induced inhibition of nociceptive impulse transmission, but motor block onset was not affected. Also there was prolongation of duration of analgesia and motor blockade. Sedation was also provided throughout the procedure without any haemodynamic instability or any side effects.

Dexmedetomidine administered intravenously produces analgesia by acting at both spinal and supraspinal levels. Primarily analgesic effect is due to inhibition of locus ceruleus at the brain stem. Additionally, its infusion may result in increased activation of α -2 receptors at spinal cord leading to inhibition of nociceptive impulse transmission via both pre and postsynaptic α -2 receptors.^{16,17} We found statistically significant difference in the onset of sensory block i.e. 1.325 ± 0.474 min. in group D and 1.65 ± 0.483 , $p = 0.0033$, showing hastening effect Harsoor et al¹⁵ observed hastening effect on sensory block onset but Reddy et al¹⁸ and Chandrashekarappa k et al¹⁹ found hastening of both the onsets of motor and sensory blocks. Gupta K, Tiwari V et al²⁰ did not observe hastening effect on motor and sensory block as iv dexmedetomidine supplementation was started 20 mins after SAB. The maximum sensory level (Median) achieved was more in group D (6.75 ± 0.981) than in control group (7.55 ± 0.8458) $p < 0.0002$. Al Mustafa et al,³ Reddy V S et al,¹⁸ Kaya F N et al,²¹ also have reported higher level of sensory blockade of hyperbaric bupivacaine with intravenous dexmedetomidine supplementation.

The time for first rescue analgesic was significantly prolonged, in group D it was 257.25 ± 15.18 , in group C, 195.63 ± 12.87 ($p < 0.0001$) Complete regression of motor blockade was prolonged in group D (216.25 ± 19.38 min vs 161.75 ± 18.73 min in group C, $P < 0.0001$). The effect of clonidine on motor blockade is concentration dependant,²² as Kaya et al²¹ did not observe any effect on motor blockade duration with single dose of $0.5 \mu\text{g}/\text{kg}$ Dexmedetomidine, there might be same explanation of this phenomenon with dexmedetomidine also. In spite of use of $0.5 \mu\text{g}/\text{kg}$ initial loading dose, motor blockade was prolonged in our study may be due to continuous infusion of dexmedetomidine. Al-Mustafa et al³ also observed prolongation of both sensory and motor blockade with intravenous supplementation of dexmedetomidine.

Intravenous administration of dexmedetomidine should not be done in less than 10 min. duration as rapid administration might produce hypertension and reflex bradycardia²³ due to peripheral α 2B adrenoreceptor stimulation of vascular smooth muscle that can be attenuated by slow infusion over 10 or more minutes. To evaluate various doses of IV dexmedetomidine ($0.25, 0.5, 1 \mu\text{g}/\text{kg}$) on ischemic pain in healthy volunteers moderate analgesia

with ceiling effect at $0.5 \mu\text{g}/\text{kg}$ ²⁴ was observed. Keeping this in mind we chose dose of $0.5 \mu\text{g}/\text{kg}$ given over 10 min.

Dexmedetomidine induced sleep qualitatively resembles normal easily arousable sleep²⁵ Patients remains cooperative and it is dose dependant, even low doses might be cause sufficient sedation²⁶ thus eliminating the need for additional sedatives thus providing better conditions for surgeon and patient. In our study intraoperatively the sedation scores were higher in group D than in control group continued for 30 min postoperatively as the dexmedetomidine infusion was discontinued postoperatively. Swati Bisht et al²⁷ observed Similar results. Al Mustafa et al³ observed scores in range of 2-5 could be due to more loading dose ($1 \mu\text{g}/\text{kg}$). There was no respiratory depression in any patients. Respiratory rate, SpO_2 and Et-CO₂ remained within normal limits.

Side effects of the dexmedetomidine like dizziness, bradycardia, hypotension, pruritus, nausea, vomiting were studied (table-9). The incidence of bradycardia was 10% in group D and 2.5% in group C and that of hypotension was 5% in group D and 2.5% in group C (Table 4-8). Both were found to be more in group D could be due to decreased sympathetic outflow and circulating levels of catecholamines due to dexmedetomidine.³ Incidence of bradycardia and hypotension was unremarkable, transient and easily treatable with atropine and ephedrine respectively as we used low dose infusion at slower rate.

Our study was done on healthy female patients and we administered a fixed slow dexmedetomidine infusion with adequate hydration. Hence different studies are required to investigate the efficacy of dexmedetomidine in geriatric and medically compromised patients also. Moreover, we studied the action of dexmedetomidine on only one local anaesthetic i.e hyperbaric bupivacaine hence study with more than one local anaesthetic for SAB so as to have more comparative data are also required to be done.

CONCLUSION

Our study has demonstrated that intravenous supplementation of loading dose of dexmedetomidine $0.5 \mu\text{g}/\text{kg}$ followed by infusion of $0.5 \mu\text{g}/\text{kg}/\text{hour}$ hastened the onset and prolonged the duration of sensory block of spinal anaesthesia. The motor block was also prolonged. It also provided sufficient sedation without respiratory depression and transient easily treatable hypotension and bradycardia. Hence, intravenous low dose dexmedetomidine supplementation, appears to be beneficial during spinal anesthesia provided the anesthesiologist is alert of development of bradycardia and hypotension.

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A Study on Evaluation of Knowledge, Attitude and Practice of Pharmacology in Second MBBS Students

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ABSTRACT

Introduction: Pharmacology is one of the most clinically applied subjects which is highly volatile. Hence new methodologies have to be introduced in medical curriculum which must be in line with the students' preferences. The study evaluated the medical students' attitude and preferences in teaching, learning methodology, rational drug use and knowledge seeking practice in Pharmacology.

Material and methods: Analytical cohort study. 248 medical students completed Para clinical curriculum with adequate exposure to Pharmacology learning. The response of the students to an exhaustive questionnaire on various aspects of teaching learning methodology in Pharmacology was analysed under various domains using SPSS 17.

Results: Questions which were not answered were taken as invalid response. Results show that majority preferred newer learning methodology, viz, 80.2% case based learning, 93% felt integrated teaching more appealing, and 81% felt peer associated teaching like group discussion is better for applied topics. Attitude of students in learning has shifted from traditional text book to the recent concept of knowledge sharing. Knowledge of rationality in drug use is deficient in 23.2%. Interest to update recent advances in medicine is found in 29.1% only.

Conclusion: The study highlights the need for interactive and modified theory teaching pattern and repeated short tests in tough chapters. Practical sessions can be used to teach basic concepts and rational use of drugs. Knowledge seeking behaviour needs improvisation by teacher.

Keywords: Student centric teaching, learning methods, knowledge seeking.

INTRODUCTION

Knowledge is to acquire, retain and use information for skill. Attitude is to react and interpret events. Good practice is progress of knowledge and technology executed in an ethical manner.¹ During undergraduate course Medical students are trained in Pharmacology in II year of MBBS curriculum. Knowledge of Pharmacology is essential in safe and effective practice of medicine. But most quote Pharmacology as very volatile subject. This study attempts to get a feedback and suggestions to improve the methods in teaching, explore the learning methodology and student's attitude towards the clinical applications of pharmacology. The questions can create space for self-assessment to the students of their approach in learning and updating recent inventions. The questions are structured to be closed ended, there is no grading or scaling. Confidentiality of the participating students and batch is maintained.

This study aims to analyse the student's view in the teaching sessions, knowledge of students in application oriented view of pharmacology, learning methodology, attitude towards learning, practice to gain knowledge in pharmacology.

MATERIAL AND METHODS

This Analytical cohort study was conducted in a south Indian medical college after obtaining institutional ethical clearance. Medical students with adequate exposure to Pharmacology who have completed Para clinical curriculum were recruited after getting informed consent explaining the intention of the study. The study was conducted over a period of 3 months.

Sample size: It consisted of 230 subjects; it was based on previous study conducted by Badyal DK et al.²

Inclusion criteria: Medical students in the second year with willingness to participate.

Exclusion criteria: Fresh medical students.

248 students were enrolled of whom 237 participated. Questions which were not answered were taken as invalid response. 106 girls and 131 boys participated. The results were analysed under four headings that is, feedback for student centric teaching, learning methodology of students, practice of rational use of drugs, and knowledge seeking behaviour.

STATISTICAL ANALYSIS

SPSS version 17 was used to generate tables and graphs. Results of the study are based on descriptive statistics.

RESULTS

1. Feed Back For Student Centric Teaching

A. Case based teaching preference and split of teaching time: Student feedback for the changes in teaching session contents to a case based discussion is 80.2 % and preference to allot 15 minutes of theory time for case discussion in pharmacology teaching is 90.7%. It shows the need to change to student centric teaching.

B. Tough chapter analysis: The result of tough chapter analysis (Figure-1) shows that CNS is difficult for 48.5% while it is ANS for 20.3%. Both chapters top the list for majority of students. This gives information to focus on these chapters in teaching by alternative methods.

C. Solutions for the tough chapters: Studies have demonstrated

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that students were tested had better long-term recall of the materials. The solutions to manage the difficult chapters are repeated test by 57.4 %, while repeated teaching by 40.5%. 85.2 % want to split the difficult chapters into smaller portions for internal assessment tests and this can be adopted.

D. Theory versus practical: 58.2% student prefer practical interesting and 73.8% say practical helps in better understanding of pharmacology, which a teacher can use to teach the tough chapters.

E. Usefulness of mcq in internal assessment test: 83.5 % students choose MCQ to study in depth and to score marks easily. Including MCQ in evaluation can help poor scorers to gain confidence, and a practice to face future competitive exams.

F. Suggestions for successful teaching learning session: For an effective teaching learning session (Figure-2), 59.1% students want to take responsibility by their responsible behaviour, while 38.8% wish to be controlled by teacher. Above outcome points that identification of responsible students making them interactive in a theory session can get the involvement of students who wish to be regulated by the teacher.

2. Learning Methodology

On analysing the individual learning approaches followed

Right Time - Exam preparation	Frequency	Per cent
3 months	115	48.5
6 months	122	51.5
Method used to memorise drug names	Frequency	Per cent
Invalid	1	.4
Mnemonics	124	52.3
Repeat recollection	101	42.6
Both methods	11	4.6
Practicing(Tabulation)Visual learning	Frequency	Per cent
Yes	38	16.0
No	199	84.0
Parallel learning useful, easy.	Frequency	Per cent
True	221	93.2
False	16	6.8

Table-1: Individual learning approaches

Usefulness of student seminar	Frequency	Per cent
Invalid	2	.8
Useful for listener	132	55.7
Useful for presenter	103	43.5
Presenter Benefits	Frequency	Per cent
Invalid	57	24.1
Improves Confidence	74	31.2
Better analysis of topic	95	40.1
Both	11	4.6
Listener usefulness	Frequency	Per cent
Invalid	73	30.8
Involved	102	43.0
Relaxed listening	60	25.3
Both	2	.8
ADR in group discussion interesting	Frequency	Per cent
Invalid	1	.4
Yes	193	81.4
No	43	18.1

Table-2: Peer Associated Learning views

by students (Table-1), regarding the time for preparation for exams 48.5% say 3 months is enough, while 51.5% say at least 6 months are needed. In the methods adopted for memorising drug names, 52.3 % adopt mnemonics 42.6% follow repeated recollection Though Visual reproduction of contents learned is useful to recollect in a short time it is adopted by 16% only, Usefulness of Integrated learning of similar topics in different subjects is recognised by 93.2 % students.

Under Peer based learning attitude, student seminar is viewed beneficial for the listener as 55.7% and 43.5% for presenter (Table-2). The way a seminar by student helps the presenter is better analysis of the topic presented for 40.1%, while for the listener it is better involvement in 43%. Results emphasise Group discussion as the method of choice to teach and learn adverse drug reactions as suggested by 81.4% of students.

3. Attitude To Rational Use Of Drugs

Awareness that learning dose and drug interactions is essential for practicing medicine, the habit to look into the safety information, to refer standard textbooks to know regarding disease, its treatment protocols are taken as measures of overall desirable approach on rational drug use. 76.8% students have desirable attitudes, whereas 23.2% are deficient in knowledge of rationality in drug use.

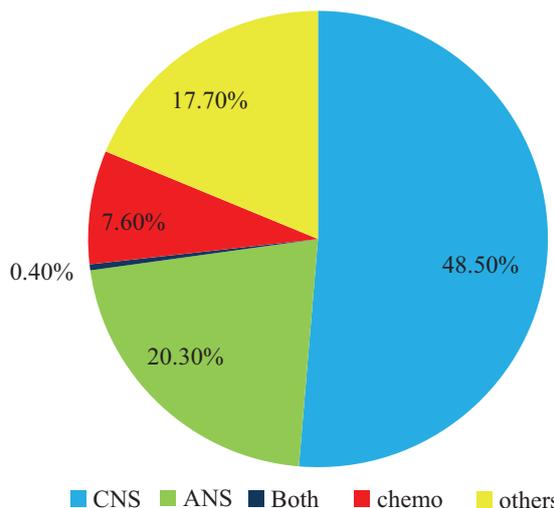


Figure-1: Tough chapter analysis

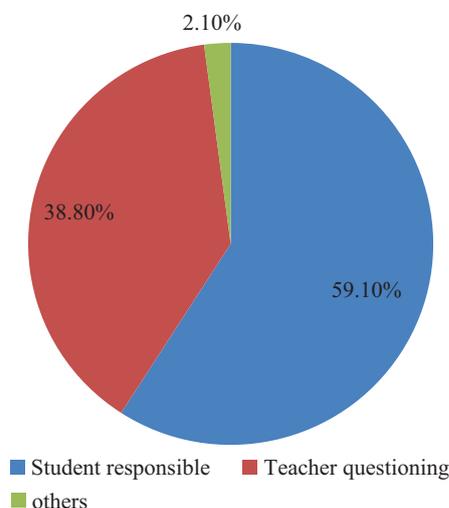


Figure-2: Suggestions for successful teaching learning session

4. Knowledge Seeking Behaviour

The pattern of utilisation of various resources available to students for an application oriented learning of pharmacology shows that 55.3 % are in the habit of reading regarding drugs used in clinical postings, but interest to look into drugs used in prescriptions is 71.3%. Above concludes to need to train students by giving exercises to reproduce regarding the prescriptions in their clinical postings. Updating knowledge out of own interest is 41.4 % through dailies, 16.9% is through medical publications. Teaching faculty intervention at this crucial period of learning can upgrade student's knowledge seeking behaviour. Student's natural drive to learn regarding drugs used in clinical postings and update through reading journals and dailies are considered as desirable and found in 29.1% student only. Knowledge seeking attitude can be improved by encouraging students presentation on new drugs inventions as short topics.

DISCUSSION

Student Centric Teaching: An in depth analysis of our results show us the attitude of students in learning has shifted from the traditional textbook learning to recent concept of knowledge sharing. As expressed in the Willis, J. teaching strategies for improving students' memory, learning, and test-taking success, it is evident by the study result that 80% prefer clinical case based teaching for student centric learning.

Preference of case presentation of respective topic followed by discussion of the drugs used in that disease /clinical condition and suggestions to allot time for the same, suggest to modify teaching sessions in pharmacology to implement student centric teaching methods.³ Central nervous system and Autonomic nervous system quoted as tough by majority of students. Studies have demonstrated that students who had extra time to study but were not tested had significantly lower recall of the materials.⁴ Students option for repeated short tests and split of portions for internal assessment test of tough chapters is suitable. Students view practical to be more motivating and to appreciate basic concepts, hence the theory sessions need to be more interactive and use practical session to teach the tough chapters. As MCQ permits study in depth and score marks easily it can be added to internal assessment evaluation. Student responsibility for a successful teaching learning session is a better approach, while surprise questioning by teacher is also needed. Medical teachers need to update their teaching skill and align it to curricular objective.³

Learning Methodology

a) Individual Learning Methods: Academic resources brain based techniques to retain information by the lomalinda university quotes that newer techniques to be adopted rather than sticking on to the older methods. Our study also confirms the views. Approach to learning method also shows a shift as 73% prefer practical oriented teaching. Recognizing learning habits and styles is a first step to initiate learning the way that best suits an individual and it is served by the questionnaire.⁵ Assessment must be changed to MCQ based, since 83.5% prefer it. The striking finding is the concept of parallel learning of same topic in related subjects; term integrated teaching appeals to 93 %. A teacher must be open minded to adopt, stress better coordination between the pre and para clinical to be executed, so that integrated teaching is feasible. The ultimate goal of pre

and para clinical teaching is to impart the basic knowledge of basic science and create awareness of its clinical application. Analysis shows that students focus in exam preparation only few months ahead of exams, but medical profession is acquiring knowledge, more than facing exam. Memorising the names of drugs is a great challenge in pharmacology, handled by students in preferred methods. Focus to rehearse the information both verbally and visually with cross-referencing of data means learning, rather than just memorizing. Majority of students do not approve any tabulating style, though visual reproduction of information leaned is useful for long term memory. Parallel learning i.e, similar topics in different subjects helps in easy understanding and learning the subjects and is preferred by students.

b) Peer Based Learning Methods: Adolescent care a lot for their peer. Teaching can focus on this attitude by introducing peer associated teaching, such as group discussion - both the presenter (43%) and the listener(55.7 %) are benefited by this method. The best way to learn something is to teach, translating the information into own words. It is a process that helps solidify new knowledge in brain relational learning.⁶ Learning Drug interactions and ADR in a Peer associated learning is preferred.

Attitude To Rational Use Of Drugs

Tripathi CD et al on his education on rational drug use stressed the importance of creating awareness among medicos in this domain, as the pattern of drug use and ADRs in India is different due to socio-economic, ethnic, nutritional and other factors.⁷ Application of pharmacologic information of the drug while using over the counter drugs by medical student is desirable. The interest to study regarding disease and treatment protocols in a standard text book, a must to follow in medical students. 23.2% are deficient in knowledge of rationality in drug use which can be improved further by intensive practice in dosage calculation, problem solving, prescription auditing exercises.

Knowledge Seeking Behaviour

As expressed by Friedman Ben-David M in the role of assessment in expanding professional horizons is by incorporation of varying sources of knowledge gain and reinforcement. The study population referred to prescriptions by 71% but lacked referring journals and publications as only 29% do so. Formative assessment is guiding future learning, providing reassurance, promoting reflection, and shaping values. This can reinforce student's intrinsic motivation to learn and inspire them to set higher standards.⁸

The effectiveness of newer methods of pharmacology teaching and evaluation was evaluated by various educationalists also report periodic testing gives better results.⁹

Badyal DK et al from his study on the rationale in using animal models, documents instead of the traditional animal experiments computer simulated software's can be introduced in pharmacology teaching.¹⁰

Reports concur with our findings that apart from regular classroom teaching innovative practices and methods are preferred by students.^{11,12} Bhosale et al survey conducted among Nigerian students recommends introduction of clinical oriented pharmacology teaching.^{13,14}

Approach to link pharmacology and medicine, habit of reading newspapers, drive to look into journals are desirable knowledge

seeking behaviours. Updating knowledge in the subject and recent inventions is an essential component of a doctor who is committed to lifelong learning, which appears deficient from the results.

CONCLUSION

The study reveals the need to modify teaching pattern, time allotment within a single theory teaching session for case based teaching. The study emphasises to make theory session interesting, interactive and use practical session to teach the tough chapters, and get student's drawn in. Repeated short tests can enable students to recollect the difficult ones with ease. MCQ may be included in evaluation. Individual Learning methodology can be improved further by coaching in visual and integrated learning. Peer based learning can be used to teach adverse drug reactions and rational drug use for future clinical competence and get students involved in this era of active reporting in pharmaco vigilance. Seminars are a healthy way to get student into teaching at their advantage and gain their association into the subject. Research oriented learning has to be inculcated in the student period. Teacher should motivate and engage the students in journal club to share innovations in pharmacology. The limitation of our study is the single time feedback which may not be sufficient to arrive at a concrete conclusion. Heterogeneous group of students and long term acquisition and analysis will provide us with more information.

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Prevalence and Antibiotic Susceptibility Pattern of *Enterococcus* Species from Various Clinical Samples in a Tertiary Care Hospital in Kolkata

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ABSTRACT

Introduction: *Enterococcus* species has recently become the major nosocomial pathogen exhibiting resistance to many antimicrobials especially to vancomycin with increasing frequency. The aim of this study was determination of prevalence and susceptibility pattern of *Enterococci* in a tertiary care hospital.

Material and Methods: This study was done in the Department of Microbiology, Nilratan Sarkar Medical College, Kolkata, from January to December 2013. The samples included urine, blood, pus collected aseptically from patients suffering from urinary tract infection (UTI), septicaemia, pyogenic infections and their culture and antibiotic sensitivity were performed as per standard recommendations. Minimum inhibitory concentration (MIC) of vancomycin was determined by E test for all *Enterococci* isolates.

Results: The *Enterococci* isolated from 8153 clinical samples were 395, accounting for an infection rate of 4.8%. The maximum number of *Enterococcus* isolates obtained from urine 80% (318), followed by pus 16% (64), and blood 3.3% (13). The sensitivity pattern of the isolates showed an increased resistance to antibiotics like ampicillin, ciprofloxacin and gentamicin. Among the isolated *Enterococci* 3.8% (15) were vancomycin resistant. All the *Enterococci* were sensitive to linezolid

Conclusions: Various studies have shown an increase in the rate of infection and antibiotic resistance in *Enterococcus* species. There is also a change in pattern of antibiotic resistance in *Enterococcus* species with an increased isolation rate of VRE. The present method of VRE detection is not beyond doubt. It needs confirmation by MIC value.

Keywords: *Enterococci*, Antimicrobial susceptibility, Vancomycin resistant *Enterococci*.

INTRODUCTION

The genus *Enterococcus* are Gram-positive, ovoid shaped cocci, arranged in short chain or in pairs. Though they are normal flora of the intestinal tract, oral cavity and vagina, but have emerged as nosocomial pathogens.¹⁻³

Enterococci have become increasingly important because of their ability to cause serious infections like endocarditis, bacteraemia, intraabdominal and urinary tract infection and due to their increasing resistance to different antimicrobials which include β lactam antibiotics, aminoglycosides and most importantly, glycopeptides like vancomycin. Serious *Enterococcal* infections are often refractory to treatment with a high mortality rate.⁴⁻⁵

Enterococcus infections have traditionally been treated with cell wall active agents (eg. penicillin or ampicillin) along with an aminoglycoside (streptomycin/gentamicin). Nowadays, increasing resistance to β lactam antibiotics and vancomycin and emergence of high level aminoglycoside resistance (HLAR) has led to failure of synergistic effect of combination

therapy.

This emphasizes the need for their identification from various clinical specimens and to determine the accurate antimicrobial resistance patterns for *Enterococci* with special reference to vancomycin susceptibility, so that effective therapy and infection control measures can be initiated.^{1,6}

The study was aimed to determination of prevalence and susceptibility pattern of *Enterococci* in a tertiary care hospital.

MATERIAL AND METHODS

The present study was conducted in the Department of Microbiology, Nilratan Sarkar Medical College, Kolkata, from January to December 2013. The sample specimens urine, blood, pus, were collected aseptically and their culture and antibiotic sensitivity were performed as per standard recommendations.

Clinically relevant samples were collected from patients admitted in the hospital due to various diseases including UTI, septicaemia, pyogenic infections. The total sample size was 8153, among which 5179 were urine, 1881 were pus, and 1093 were blood samples. For semi quantitative urine culture Cysteine Lactose Electrolyte Deficient Medium (CLED) was used. On MacConkey's agar and blood agar pus and blood samples were inoculated.

Enterococcus species were isolated from 395 samples. They were identified by using standard tests. Kirby Bauer disc diffusion method on 5% Mueller Hinton blood agar was used to determine the antimicrobial susceptibility along with a control strain of ATCC *E. faecalis* 29212, as per CLSI guidelines.

MIC of vancomycin was determined by E test for all *Enterococci* isolates. A lawn culture of *Enterococci*, 0.5 Macfarland's standard was made on 5% Mueller Hinton blood agar. The E strip obtained from Himedia was applied with an MIC scale. After an incubation period of 24 hours of at 37°C an elliptical zone of inhibition was observed. The antibiotic susceptibility pattern was interpreted as per Clinical and Laboratory Standards Institute (CLSI) guidelines, 2007.⁷⁻⁹ Ethical standards as per the Helsinki declaration of 1975 as revised in 2000 was followed while conducting the study.

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STATISTICS ANALYSIS

Microsoft Excel and Microsoft word (version 8.1) were use to generate the tables and figures. Results are based on descriptive statistics.

RESULTS

From various clinical samples, 395 *Enterococcus species* was isolated in a period of one year and the rate of infection was estimated to be 4.8% (table-1). Isolates were highest from urine 80% (318), followed by pus 16% (64) and blood 3.3% (13) (Figure-1,2). An increased resistance to ampicillin (70), ciprofloxacin (92), gentamicin (91.4) (Figure-3) was observed among the isolates. Among the *Enterococci*, 3.8% were Vancomycin Resistant (VRE). All the *Enterococci* were sensitive to linezolid (Figure-4).

DISCUSSION

The *Enterococcus* species recently isolated more frequently from clinical specimens as nosocomial pathogens. As per CDC (1993) data, the *Enterococci* are the second leading cause of nosocomial infection.² Their increasing resistance to many antimicrobial agents like β lactam antibiotics, aminoglycosides and most importantly glycopeptides like vancomycin have made it a important nosocomial pathogen.⁶

In our study, *Enterococci* were isolated from various clinical specimens with prevalence rate of 4.8%, which was lower than the study by Desai et al and higher than the study by S. Sreeja et al.^{2,6}

Isolates were highest from urine (80%), followed by pus and blood. Most of the studies done on *Enterococci* support the same findings as *Enterococci* identified as the most frequent uropathogen.^{1,10}

Penicillin along with aminoglycosides considered as treatment of choice, hence resistance of *Enterococci* against these antibiotics has important clinical implications. Our study showed that 70% of isolates were resistant to ampicillin, 92% to ciprofloxacin, 91.4% to gentamicin, which showed a drastic increase in resistance of the commonly used drugs, comparable to the study conducted by J. Parameswarappa et al, and Mendiratta et al.^{1,11} This finding was also reported in some study.^{12,13}

The most recent and important resistance in *Enterococci* is vancomycin resistance has been increasingly reported from all parts of the world. In our study 3.8% the isolates are VRE which showed significant similarity to results reported from other studies ranging between 1.7-20% in tertiary care hospitals in other parts of India.^{1,5,6,14-16}

Study of Parameswarappa et al and Karmakar et al from India have reported higher percentage of VRE.^{1,17}

The high prevalence of multidrug resistant *Enterococcal* infection in a tertiary care set up is due to excessive and indiscriminate use of broad spectrum antibiotics and high rate of patient transfer from peripheral centres.¹ The emergence of VRE has been attributed to the inprudent use of vancomycin, the colonization pressure and noncompliance with the infection

control measures.⁶

For long time, *Enterococci* were frequently considered as normal flora. Recently however due to its role in causing variety of infections in hospitalized patients and increasing resistance to different antibiotics has led to understanding the importance of *Enterococcus*.²

By increasing awareness regarding drug resistance and use of

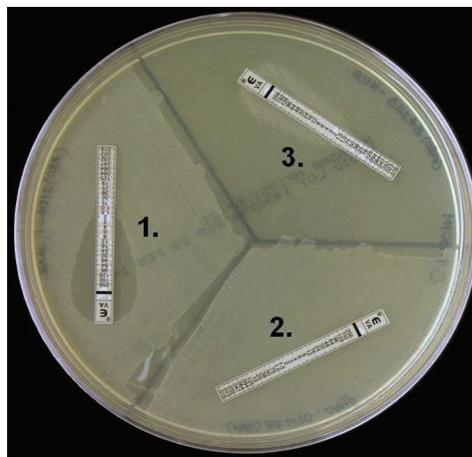


Figure-1: E Test for VRE detection

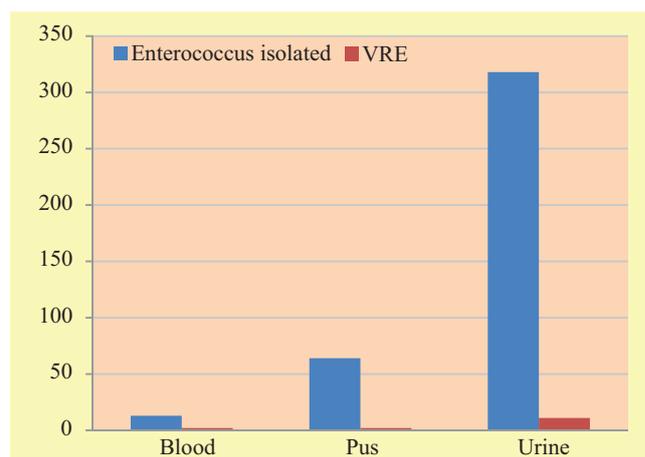


Figure-2: Enterococcus species isolated from different clinical samples

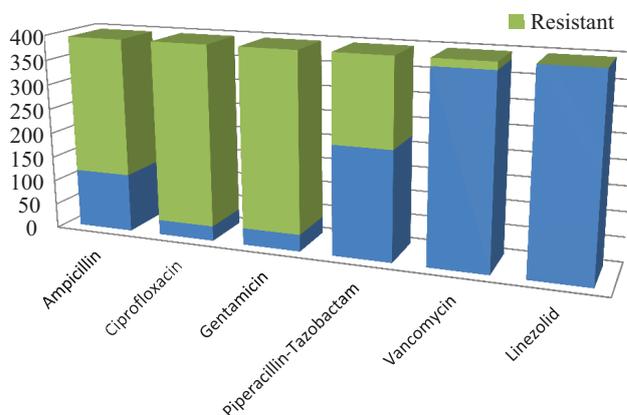


Figure-3: Antibiotic sensitivity pattern of Enterococcal isolates

Antibiotics	Ampicillin	Ciprofloxacin	Gentamicin	Piperacillin	Vancomycin	Linezolid
Sensitive (%)	30	8	8.6	56	96.2	100
Resistant (%)	70	92	91.4	44	3.8	0

Table-1: Antibiotic susceptibility pattern of *Enterococci*

proper antimicrobials, further emergence of VRE and multidrug resistant *Enterococci* can be reduced.⁶

CONCLUSIONS

Various studies have shown an increase in the rate of infection and antibiotic resistance in *Enterococcus* species. There is also a change in pattern of antibiotic resistance in *Enterococcus* species with an increased isolation rate of VRE. The present method of VRE detection is not beyond doubt. It needs confirmation by MIC value estimation and detection of resistance encoding gene by molecular techniques.

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Awareness of Emergency Contraception among 1st Year Medical Students

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ABSTRACT

Introduction: In order to safeguard the health of women, it is mandatory to cut down the incidence of unsafe abortions. Emergency contraception has the potential to greatly reduce the number of unintended pregnancies and thus helping in curtailing the rate of unsafe abortions. Aim of the study was to determine the knowledge of 1st year medical students about emergency contraception.

Material and methods: A questionnaire study was done on 100 1st year medical students at MMIMSR, Mullana. Simple percentages were used for statistical analysis.

Results: The results showed that all the students were aware of existence of emergency contraception. They also knew the correct time limit of 72 hours. But there is lack of knowledge about other aspects of emergency contraception like side effects, efficacy, its availability etc.

Conclusion: Because of increasing adolescent sexual activity and decreasing age of 1st sexual intercourse there is urgent need to educate students at the school level.

Keywords: emergency contraception, awareness, medical students

INTRODUCTION

Globally 20 million illegal abortions take place every year and out of this 97% occur in developing countries.¹ Unintended pregnancy poses a major challenge to the reproductive health of young adults in developing countries. Some young women with unintended pregnancies obtain abortions—many of which are performed in unsafe conditions—and others carry their pregnancies to term, incurring risks of morbidity and mortality higher than those for adult women.² In the U.S, it is estimated that emergency contraception could annually prevent 1.7 million unintended pregnancies and the number of induced abortions would decrease by about 40%.³ In developing countries about 30% of women give birth to the first child before the age of 20.⁴ Emergency contraception has the potential to greatly reduce the number of unintended pregnancies. Many women do not know of emergency contraception. Even if they are aware, accurate and detailed knowledge is lacking. Therefore availability must be accompanied by education and motivation. The aim of the study was to determine the knowledge of 1st year medical students about emergency contraception.

MATERIAL AND METHODS

A questionnaire study was done on 1st year medical students in MMIMSR, Mullana, Ambala after obtaining the ethical clearance from the university ethical board. All the study students were in the age group of 17-19 years and were recruited for study after taking written informed consent.

In India around 19% of the population is constituted of adolescents, of which 90 million are between 15 and 19 years

of age.⁵ Now days there is increasing adolescent sexual activity and decreasing age at first sex. The average age for first sexual intercourse in India is 17.4 years for boys and 18.2 years for girls.⁶ A questionnaire consisting of 10 questions regarding different aspects of the emergency contraceptive pill was made. Students were told that the questionnaire was confidential and anonymous. They were encouraged to complete it honestly and without discussing with their classmates.

The questionnaire was given to 100 students. Out of which 49 were boys and 51 girls. Till date most of the studies have been done on non-medicos. A study done by Puri S et al⁷ among university students in Chandigarh also focused mainly on non-medical students and excluded medicos assuming that there is good amount of awareness regarding contraception amongst them. So this study was undertaken to know how much medical students are different from their non-medical counterparts regarding awareness of emergency contraception.

STATISTICAL ANALYSIS

Descriptive statistics were used to infer results and Microsoft Word 2007 was used to generate tables.

RESULTS

All the students (100%) had heard of the emergency contraceptive pill (ECP) suggesting that there is a good awareness of its existence amongst teenagers. When asked how long after intercourse the ECP could be taken, 78% of boys and 86% of girls knew the correct time limit of 72 hours; the others answered either 24 or 48 hours. None of them answered 12 hours. 2% of boys and 8% of girls did not know the answer. Our study shows that teenagers are unaware of the number of times it can be used in a year. Half of the students did not know the answer. One third of the students think it can be used more than twice in a year. 67% of the girls knew that it is not 100% effective in preventing pregnancy while only 49% of the boys could answer it correctly. 24% of the boys did not know the answer while 35% think it is 100% effective in preventing pregnancy. A large number of students were aware that emergency contraception does not protect against sexually transmitted infections. Regarding the availability of the drug, 53% of the boys knew that it could be obtained either from a doctor or a pharmacist. Few of the girls were aware of over the counter availability of drug. 46% of

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	Boys %	Girls %	Boys and girls %
Q1. Have you heard of the emergency contraceptive pill, also known as the morning after pill?			
Yes	100	100	100
No	0	0	0
Q2. How long after having intercourse can the emergency contraceptive pill (morning after pill) be taken?			
Up to 12 hours	0	0	0
Up to 24 hours	6	4	5
Up to 48 hours	14	2	8
Up to 72 hours	78	86	82
Don't know	2	8	5
Q3. How many times can the emergency contraceptive pill be used in a year?			
Once	10	4	7
Twice	12	6	9
More than two times	30	33	32
Don't know	52	57	55
Q4. Is the emergency contraceptive pill 100% effective in preventing pregnancy?			
Yes	35	25	30
No	49	67	58
Don't know	16	8	12
Q5. Does the emergency contraceptive pill also protect against some sexually transmitted infections?			
Yes	10	16	13
No	84	82	83
Don't know	6	2	4
Q6. Where can a 16 year old girl get the emergency contraceptive pill?			
% stating doctor	29	46	37
% stating pharmacist	18	27	22
% stating doctor/ pharmacist	53	27	40
Q7. Can a doctor give a girl who is 16, the emergency contraceptive pill without telling her parents?			
Yes	8	4	6
No	84	88	86
Don't know	8	8	8
Q8. Does emergency contraceptive pill have serious side effects?			
Yes	53	46	50
No	31	25	28
Don't know	16	29	23
Q9. Can the emergency contraceptive pill be used if a woman is already taking the regular contraceptive pill?			
Yes	24	16	20
No	49	49	49
Don't know	27	35	31
Q10. How many tablets of emergency contraceptive pills to be taken after a single act of unprotected intercourse?			
Single tablet	72	61	67
Two tablets	4	4	4
Multiple tablets	4	2	3
Don't know	20	33	27

the girls answered it could be obtained only from a doctor. So this study shows that even 1st year medicos do not know that it can be obtained from a pharmacist without the prescription of doctor. Most of the students (girls-88%, boys-84%) did not know that a doctor can give the emergency contraceptive pill to a 16 years old girl without telling her parents. When we asked if emergency contraception has serious side effects, 53% of boys and 47% of the girls answered "YES". Only 25% of girls and 31% of boys thought it to be safe. 29% of the girls did not know the answer, thereby reflecting the incomplete knowledge regarding ECP even among 1st year medical students. When asked whether the emergency contraceptive pill could be used if a woman was already taking the ordinary contraceptive pill, there was a general lack of knowledge among the students. Half of the students answered that it can't be taken by regular pill

users. 35% of girls and 27% of boys did not know the answer. Boys were more aware (72%) regarding the number of pills than girls (61%). Very few students answered two or multiple doses.

DISCUSSION

Our study shows that there is a good awareness of its existence of emergency contraception amongst teenagers. A study done by Pankaj Kumar Mandal⁸ in rural area of Kolkata showed that only 61% of the students had heard of emergency contraception. This huge difference regarding awareness of emergency contraception might be because our students belonged to urban India and from upper socioeconomic status. In the present study majority of the students knew the correct time limit of 72 hours whereas in a study done by Puri S et al⁷ only 14.7% of the students knew about correct timing of use. This variation in results of two studies might be because we have interviewed

only medical students. Students should be made aware that ECP is not to be used as routine contraceptive method but at the same time they should be told that there is no limit to the number of times it can be used in a year.⁹ A potential barrier to women presenting for the (ECP) is the fear that they might be denied it because of overuse.¹⁰ Girls are much more aware of its efficacy than boys. This difference might be because boys have fewer opportunities to receive information and counseling about sexuality, contraception and prevention as they do not need to consult a physician to get their contraception. If boys get the chance to discuss sexual issues with their partner or with a health professional, their awareness improves significantly. Confidentiality is an essential part of family planning medicine. Doctors must encourage the teenagers to inform their parents but should not force them to do so, with the exception of when child protection becomes an issue.¹⁰ This study shows that vast majority of young teenagers are unaware that emergency contraception can be obtained confidentially. Although in many situations of missed pills the emergency contraceptive pill is not required, if pills are missed at certain times of the menstrual cycle or multiple pills are not taken, there may be risk of pregnancy. Users of the oral contraceptive pill should be aware that they are not excluded from the use of emergency contraceptive pill, should they require it.¹⁰

Though there is various commercial pills available in the market but "I" pill is the most commonly used and widely publicized in the social media so a vast majority of students knew that only a single pill is to be taken after a single act of intercourse. Boys were more aware (72%) regarding the number of pills than girls (61%). This might be because of more inclination of boys towards social media than girls.

CONCLUSION

From this study we concluded that 1st year medical students are no different than other under graduates except that they are more aware of its existence and correct timing of use but there is lack of knowledge about the safety of drug and scenarios in which it can be used. So there is a need to educate adolescents not only about the existence of drug but also about over the counter availability, its efficacy in preventing pregnancy and conditions in which it can be used. This information should be included in school sex education programs. It is also the responsibility of doctors and other health care providers to make teenagers aware of various issues regarding emergency contraceptive use. Future policies should emphasize in designing and implementing different educational programs in order to meet these needs and prevent further unwanted pregnancies.

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Retrospective Analysis of Donor Site Morbidity Following Partial Fibular Resection

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ABSTRACT

Introduction: The use of fibula as either vascularised or free graft has increased in recent times. However it is necessary to weigh the usefulness of the procedure against the background of its associated morbidity. We wanted to evaluate the functional outcome in terms of pain and motor weakness at residual donor site associated with the removal of fibula at different level.

Materials and methods: Retrospective study of 85 cases were done to determine prevalence of donor site morbidity after fibular resection. Pain, motor weakness, sensory abnormality and ankle or knee instability were recorded. Average duration of follow up was three years.

Results: Thirty eight (44.70%) cases were completely free of symptoms. At three year follow up 35 cases (41.17%) had mild to moderate pain. Forty three (50.58%) cases had extensor hallucis longus weakness out of which 27 cases (31.76%) had isolated extensor hallucis longus weakness while 16 cases (18.82%) had EHL weakness with other muscles. All recovered within 6 months to 2 years. Out of 9 cases with fibular resection in proximal third, 5 (55.55%) had motor weakness and out of 76 cases with fibular resection in middle third, it was found that 38 cases (50%) had motor weakness. The prevalence of subjective sensory abnormality increased with duration of time. At three year post operative visit, 12 patients (14.11%) had intermittent dysesthesia, 5 (5.88%) had numbness of medial foot and 1 (1.17%) had numbness of dorsum of foot. None of the cases had ankle or knee instability. Most significant radiological finding was osteoporosis of distal fibular remnant.

Conclusion: Donor-site morbidity following simple and marginal resection of the proximal fibula is acceptable.

Keywords: Fibular graft, Donor site morbidity, motor weakness, ankle instability, knee instability

our clinical experience with problems related to donor site that we have encountered after these grafts have been obtained.

MATERIAL AND METHODS

Retrospectively 85 patients with age above 18 years, who were treated with fibular bone graft either for traumatic or tumor reconstruction procedure, between May 2009 to June 2014, were included in the study. Patients having compound fractures or with pre-existing neurological deficits were excluded. This study was approved by ethical committee of university and informed consent was taken from patients.

Average age of patient was 45 years. Fifty seven (67.05%) of the cases were male and 28 (32.94%) were female. The male to female ratio was 2.03: 1. Average duration of followup was three years. In 50 (58.82%) cases fibular graft was taken from right side and in 35 cases (41.17%) fibular graft was taken from left side. Middle third of fibula was harvested in 76 patients (89.41%) while only in 9 patients (10.58%) had proximal third fibular resection. None of the patient had distal third fibular resection. In all the cases length of distal fibular remnant was more than 7.5 cm.

The patients were examined postoperatively at three month, six month, one year, eighteen month and yearly there after. At these postoperative visits, the patients were asked about any subjective sensory abnormality and whether they had any pain at or in the vicinity of donor site, either while they are at rest or when they were active. The pain was graded accordingly as mild, moderate and severe. All the patients were examined for knee, ankle or hind foot instability and range of motion was also recorded. Any detectable weakness of the extensor hallucis longus, flexor hallucis longus, or peroneal muscles were graded for strength according to the MRC scale.

Plain anteroposterior and lateral radiographs of donor site were made in almost all patients. In cases with proximal third fibular resection, varus and valgus stress view of knee was done. The length of resected fibula and the length of proximal and distal fibular remnants were measured.

INTRODUCTION

In recent years the fibula has been used as a free graft and as a vascularised transplant to bridge large bony defects. Taylor et al¹ first reported on vascularised fibular transfers in 1975 and this technique is now extensively used for reconstruction of bony defects secondary to trauma and tumor related resection. Many authors have studied the static and dynamic function of fibula in stability of ankle and load transfer.^{2,3} Thus removal of a portion of fibula can result in donor site morbidity. We have used a large number of free fibular grafts in the treatment of fracture neck of femur, nonunion of long bones, tumour resection, avascular necrosis of femur and congenital pseudoarthrosis of tibia. We believe that the removal of portion of fibula is associated with acceptable morbidity when weighed against the potential benefits of the graft. The purpose of this study was to present

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The standard posterolateral approach of Henry was used in all cases. The muscles were reflected gently from the fibula by subperiosteal dissection using a periosteal elevator starting at the distal end.

STATISTICAL ANALYSIS

The sample characteristics were described with its mean \pm SD/percentage (95% Confidence levels), as applicable. The data was analysed by using SPSS 16.0 version.

RESULTS

Early Complications

In our series of 85 patients, early complications found were thromboembolic complications in 1 (1.17%), haematoma formation in 1 (1.17%), superficial infection in 2 (2.35%) and compartment syndrome in 1 (1.17%). Two patients had lateral popliteal nerve palsy and had foot drop.

In early postoperative period hypoesthesia in isolated anatomical area like dorsum of foot in 2 patients, lateral border of foot in 4, lateral part of calf in 1 and first web space in 2 patients. Numbness of medial foot was complained by 2 patients.

Late Complication

Pain

The prevalence of pain after activity increased substantially with time. No patient complained of rest pain at follow up. Fifty patients (58.82%) rated themselves as pain free. Only 18 cases (21.17%) complained of pain at three month follow up which increased to 35 cases (41.17%) at three year follow up. There was pain at donor site in 17 cases (20%) and at ankle in 1 case (1.17%) at three month postoperatively which increased to donor site pain in 28 cases (32.94%), at ankle in 5 cases (5.88%) and at knee in 2 cases (2.35%) at three year follow up. No patient had severe pain to limit daily activities.

Motor Weakness

The most frequent complication after the fibular grafts had been obtained was muscle weakness. Forty three (50.58 %) of the 85 cases had extensor hallucis longus (EHL) weakness, out of which 27 cases (31.76%) had isolated extensor hallucis longus weakness while 16 cases (18.82%) had EHL weakness with other muscles (Figure-1). The flexor hallucis longus (FHL) and extensor digitorum longus (EDL) were affected in 11 (12.94%) and 6 (7.05%) cases respectively. Six cases (7.05%) had weakness of peroneii and 2 (2.35%) cases had tibialis anterior



Figure-1: Extensor hallucis longus weakness (lt) immediate post op.

weakness.

All recovered within 6 months to 1 year except in 2 patients with deep peroneal nerve injury which found to be recovered by 2 year postoperatively and at three year postoperative visit none of the cases had residual weakness of extensor hallucis longus and other muscles.

Sensory Abnormality

The prevalence of subjective sensory abnormality also increased slightly with duration of time. Intermittent dysesthesia was complained by 3 patients (3.52%) at three month follow up which increased to 12 patients (14.11%) at three year follow up. Numbness of medial foot was present in 2 patients (2.35%) at three month postoperatively, which increased to 5 (5.88%) at three year follow up. Numbness over dorsum of foot in 1 case (1.17%), which was not present at three month follow up, appeared late and persisted when last seen at three year. Hypoesthesia were specifically located in discrete and isolated anatomical areas, such as lateral border of foot in 4 patients (4.70%), dorsum of foot in 3 (3.52%), lateral part of calf in 1 (1.17%), and first web space in 2 patients (2.35%) at three month follow up, with decreasing prevalence recorded over time, but symptoms had resolved in all of them by 18 months to 2 years postoperatively.

Ankle And Knee Instability

None of the patient evaluated had ankle and knee instability.

Range Of Motion Of Ankle And Knee

There were no differences in range of motion between operated and nonoperated side except in 2 cases where limitation of active dorsiflexion of ankle was present due to lateral popliteal nerve palsy, but at 3 year post-operative visit no patient had limitation of range of motion. However, average muscle strength was lower on the operated than the nonoperated side.

Radiographic Follow Up

The most significant finding was osteoporosis of distal fibular remnant (Figure-2) in patients with fibular resection in 65 patients (76.47%). The radiograph showed rounding of cut ends of fibula in 48 cases (56.47%) and irregular new bone formation at cut ends in 11(12.94%). There was thin bridged bone formation in fibular bed in 9 cases (10.58%). None of the cases had varus and valgus instability of knee and ankle (Figure-3). None of the cases had proximal migration of fibula.

DISCUSSION

Many authors have studied the static and dynamic function of fibula in stability of the ankle and load transfer.²⁻⁹ It has been shown that from 10%^{5,6} to 16%^{4,7} of the total weight bearing load is transmitted through the fibula. It also serves as an attachment for ligaments of knee and ankle, the interosseous membrane of leg, and muscles of lower extremity.

Gore,¹⁰ 1987, followed 41 patients for an average of twenty seven months. Only sixteen (39%) of their patients were asymptomatic, and six (15%) complained of moderate or severe pain associated with donor site, 11 mild pain and three complained of pain in the ankle. This study demonstrates that most patients will have subjective complaints and mild muscular weakness after removal of a portion of fibula.

Lee et al,¹¹ 1990, studied on ten adults after resection of fibula. All knees and ankle were clinically and radiologically stable,



Figure-2: One year post op x-ray showing osteoporosis of distal fibular remnant



Figure-3: Varus stress view of both knee showing no change in lateral joint space following proximal fibular resection

but the distal fibular remnant was osteoporotic in nine patients. In our series out of 85 cases with fibular resection, 38 (44.70%) were completely free of symptoms. No patient complained of rest pain at follow up. The prevalence of pain increased substantially with time. Fifty patients (58.82%) rated themselves as pain free, 27 patients (31.76%) had mild pain, and 8 patients (9.41%) had moderate pain. All of the patient relate their pain to specific functional activities.

Various other authors¹⁰⁻¹⁶ also reported pain or discomfort during walking in their series. We attributed prevalence of pain and weakness or discomfort during walking to one of the following causes:

1. Average age of patient in our series was more as compared to the series of Gore et al¹⁰ and T. Parker Vail et al.¹⁴ This age difference may be a factor in rate of complication.
2. Our most of the patient had severe debilitating condition of the ipsilateral hip which necessitated 6 – 12 week period of non-weight bearing and possibly a lower initial level of activity.
3. May be probably due to reduced load transfer following resection of fibula.⁴⁻⁷

Many authors¹⁷⁻²⁵ have studied the course of motor branch to the extensor hallucis longus and they were of opinion that following dissection of fibula in upper and middle one third, carries a risk of injury to the nerves innervating the extensor hallucis longus

and they recommended that fibular osteotomy should be carried out at the junction of middle and distal third of fibula^{17,23} and in proximal fibula up to 20.5 mm distal to the tip of fibular head.²¹ Shingade et al,¹⁸ 2004 studied the branching pattern of the deep peroneal nerve in detail on 40 specimens of cadaver. In all the specimens a single branch was found supplying extensor hallucis longus. There were two variations in its course and site of entry in to muscle:

- a. The tibial variation in which the nerve branch to EHL runs close to the tibia and then enters in to muscle on the tibial side.
- b. The fibular variation in which the nerve branch to EHL runs close to the fibula and enters the muscle on the fibular side.

They found that those in which the nerve to extensor hallucis longus ran close to the fibular periosteum, were at risk. Most frequent complication, in our series, obtained was muscle weakness. Forty three (50.58%) cases had extensor hallucis longus weakness out of which 27 cases (31.76%) had isolated extensor hallucis longus weakness while 16 cases (18.82%) had extensor hallucis longus weakness with other muscles.

S. S. Babhulkar et al,¹² in their series of 104 cases, 48 had muscle weakness out of which 35 had isolated extensor hallucis longus weakness and 13 had extensor hallucis longus with other muscles.

Various other authors^{10,11,14,15,17,18,26} also reported motor weakness mainly extensor hallucis longus ranging from 10 – 55% of the cases in their series.

We have harvested fibula either in the proximal third or in the middle third portion of fibula i.e. in the danger zone of fibula. We attributed decreased motor function or sensory abnormality in our series to the following factors:

1. Complications occurred probably due to direct damage to the nerve or due to pressure or tension on the nerve by Hohman retractor.
2. May be due to the variation in the course of nerve (V. U. Shingade et al¹⁸ and Kirgis et al¹⁷).
3. Functional lengthening of muscle, especially if its site of origin has been removed¹⁴.

Many other authors (Pho,²⁷ E. H. Lee et al,¹¹ S. S. Babhulkar et al¹² and Marco Innocenti et al²⁸) reported no knee instability in their series following proximal fibular resection. whereas others^{29,30} reported moderate, symptomatic, lateral laxity as a complication in one-half of their patients who had excision of the proximal fibula. However, in our series none of the cases had knee instability or lateral ligament instability. Many authors have suggested that all attempts should be made to preserve the distal 6-8 cm of the fibula to maintain the lateral stability of the ankle.^{1,10,12-15} Distal fibular remnant, in our series, was at least 7.5 cm or more and none of the cases evaluated had ankle instability.

The most significant radiological finding in our series was osteoporosis of distal fibular remnant in 65 patients (76.47%) and is probably due to reduced load transmission.

CONCLUSION

The fibula has the dual biomechanical role of providing a site of origin for the muscles and of serving as a rigid body in load transfer, and is critical structure in ankle stability. Although the fibula is an invaluable source of graft, this study demonstrates

that most patients will have subjective complaints and mild muscular weakness after removal of a portion of the fibula, but these symptoms are not considered significant to discourage the use of large segments of fibula. However, it may be wise to inform the patient that some morbidity may result from the resection of the fibula from the donor leg.

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Anatomic Variations of Arteria Dorsalis Pedis: A Cadaveric Study on 40 Dissected Lower Limbs with Clinical Correlations

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ABSTRACT

Introduction: Few structures of the human body are as unique as the foot. The foot needs to be mobile, stable and functional in order to position the body and bear body weight. Integration and coordination between the various structural elements of the foot are required for quiet standing or locomotion. The foot is subject to trauma, surgery, arteriosclerotic and endocrine diseases. Arteria dorsalis pedis is the principal source of blood supply to the foot. As many variations in course, relations and branching patterns of this vessel have been reported it has gained attraction among researchers.

Material and Methods: Forty lower limbs from twenty embalmed cadavers were studied in the Department of Anatomy and variations in the anatomy of arteria dorsalis pedis artery were reported.

Result: Normal anatomic description was found only in 26/40 (72.5%) specimens whereas variations were reported in 11/40 (27.5%) specimens.

Conclusion: Variations in anatomy and branching patterns of arteria dorsalis pedis are clinically significant and may lead to obfuscations during foot surgeries and imaging studies.

Keywords: Arteria Dorsalis Pedis, Foot, Imaging, Surgery, Variations

INTRODUCTION

The arteria dorsalis pedis is the chief irrigating vessel of the foot. Palpation of pedal pulse is used to evaluate patients with arterial diseases. This vessel provides the basis of anatomical rationale for surgically raising a flap of skin over the dorsum of the foot which can then be used to resurface other areas of the body.¹ Normally the anterior tibial artery continues as the arteria dorsalis pedis. The anterior tibial artery enters the foot under the inferior extensor retinaculum and runs distally towards the interspace between the first and second toes.²⁻³ The arterial feeders of the foot are derived from the arteria dorsalis pedis and its branches on the dorsal aspect.⁴ There are few reports of higher bifurcation of the anterior tibial artery to form the arteria dorsalis pedis.⁵ This artery divides into two branches in the first dorsal intermetatarsal space.⁶ The larger branch is the first dorsal metatarsal artery that disappears between the two heads of the first dorsal interosseous muscle into the sole of the foot. A smaller arcuate artery runs transversely across the dorsum and provides most of the dorsal metatarsal arteries usually two to four. These arteries communicate with the plantar metatarsal arteries and end as tiny dorsal digital arteries. Branching patterns of arteria dorsalis pedis as mentioned in classical textbook description is arcuate artery, medial and lateral tarsal arteries, and first dorsal metatarsal artery.⁷⁻⁸ This artery serves as an important vascular landmark on the dorsum of the foot and is prone to exhibit variations. The aim of this study was to observe variations in the course, relations and branching patterns of

arteria dorsalis pedis.

MATERIAL AND METHODS

This study was performed on forty formalin fixed lower limbs of unknown age and sex in the Department of Anatomy, MGM Medical College, Kishanganj, Bihar. The study was performed during routine dissection classes of 1st MBBS. The leg and dorsum of foot were dissected following Cunningham's dissection manual. Anatomy and branching patterns of arteria dorsalis pedis were observed in detail. The study was approved by the Institutional Ethics Committee.

RESULTS

Conventionally described arteria dorsalis pedis was found in 29 cases (72.5%). Variations observed in 11 feet (27.5%) were as follows:

1. Variation in origin of arteria dorsalis pedis: In 3 cases the anterior tibial artery did not continue as the arteria dorsalis pedis. The peroneal artery gave off a large perforating branch which continued as arteria dorsalis pedis.
2. Variation in course of arteria dorsalis pedis: In 3 cases the arteria dorsalis pedis deviated laterally from the midline in the proximal aspect but returned to the midline in the distal aspect. The branching patterns were conventional.
3. Absence of arcuate artery: In 2 cases the origin and course of arteria dorsalis pedis was normal but absence of arcuate artery was observed as variation in branching pattern.
4. Variation in third and fourth metatarsal arteries: In 2 cases the origin and course of arteria dorsalis pedis was normal but the third and fourth dorsal metatarsal arteries were observed to be arising from the second dorsal metatarsal artery.
5. Absence of arteria dorsalis pedis: In 1 case the entire artery was absent. The anterior tibial artery ended by giving off tarsal branches beyond which the anterior tibial artery was untraceable.

DISCUSSION

On dissection of 40 embalmed cadaveric feet, we observed that the arteria dorsalis pedis was completely absent in only one case. The anterior tibial artery ended by giving off the tarsal branches.

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In three cases, the perforating branch of the peroneal artery continued as the arteria dorsalis pedis. In three cases, variations were noted in the course of the artery but the branching pattern was normal. In two cases, the arcuate artery was absent and in two cases, variation in origin of third and fourth metatarsal arteries were noted. Variations in blood vessels can be related to their development as blood vessels after formation soon merge with each other and form new vessels which canalize to form new vessels. The arteria dorsalis pedis is noted for its variations.⁹ The arcuate artery was defined as that artery branching off from the arteria dorsalis pedis at or below the level tarsometatarsal joints, running laterally across bases of metatarsals second to fourth and supplying the dorsal metatarsal arteries 2-4. Arcuate artery is not always the principal source of blood supply to the dorsal metatarsal arteries 2-4.¹⁰⁻¹¹ The calibre of the dorsal metatarsal arteries in the third and fourth spaces is very small. The lateral one-third of the dorsum of the foot has poor blood flow and this area may be prone to non-healing ulcers of diabetic foot.¹² Grafts done in these areas may not be successful.¹³⁻¹⁴ Arterial patterns of the foot should be assessed prior to podiatric surgery by arteriography and angiography for better postsurgical outcome.

CONCLUSION

Variations in anatomy of arteria dorsalis pedis are incidentally found in routine dissections of the foot. This vessel plays an important role in foot surgeries as it is the chief irrigating artery of the foot. Knowledge of its anatomic variations shall be useful in deciding whether the artery is present, absent or thrombosed. Such variations are of significance to the triad of anatomists, angiographers and vascular surgeons during interpretation of imaging studies. Comparatively the medial aspect of the foot is better nourished by this artery and its branches.

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Conscious Sedation in Pediatric Dentistry: A Review

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ABSTRACT

Fear and avoidance of dental treatment are considered to be major barriers to oral health. Most of child dental patients can be treated efficiently and with little or no discomfort or fear by the use of adequate local analgesia, modern equipment, careful patient management and good technical skill. However, dental treatment often includes painful procedures that may precipitate fear and anxiety in patients. Also, there is a considerable group of children with special health care needs that pose a problem to the effortless delivery of dental treatment. Methods to manage anxiety and behaviour are therefore required to meet this need. Nitrous oxide-oxygen sedation meets almost all of these requirements and has, therefore, been propagated and used for years in many countries. Inhalation sedation utilizing nitrous oxide-oxygen has been a primary technique in the management of dental fears and. The technique has an extremely high success rate coupled with a very low rate of adverse effects and complications. However, there is a need for effective training in this technique and more acceptance by the dental professionals in our country.

Keywords: Nitrous-oxide sedation, Conscious Sedation, Anxiety, Dental Fear, Moderate Sedation

INTRODUCTION

Reasons for not seeking dental treatment may be various, including cost concerns or anxiety due to anticipation of pain. Malamed¹ claims that fear, anxiety and pain have long been associated with the practice of dentistry, although he goes on to explain that image of the dentist as an instrument of pain is not justified. Pain is an unpleasant emotional experience usually initiated by a noxious stimulus, mediated over a specialized neural network to cortical and subcortical centers where it is interpreted as such.² Dental anxiety can be managed either by non-pharmacological methods like behavior therapy, desensitization or by pharmacological means that include conscious sedation techniques using inhalation sedation (nitrous oxide/oxygen mixture), oral or intranasal sedation (midazolam), intravenous sedation (midazolam) and general anaesthesia. The goal of conscious sedation is to alleviate fear and anxiety in order to facilitate treatment and it serves only as an adjunct to behavioural shaping techniques, and not a replacement.

DEFINITION AND CONCEPT

The Joint commission on Accreditation of Health Care Organizations (Chicago, Jan1, 2001)³ has defined four levels of sedation (Table-1).

We must first describe the word 'conscious' before defining Conscious Sedation. According to a definition by the American Dental Society of Anesthesiology, a patient is said to be conscious if he is capable of rational response to command and has all protective reflexes intact, including the ability to clear and maintain his airway in a patent state.

The UK Department of Health⁴ (2003); National Dental Advisory Committee, (2006) General Dental Council and the

Dental Sedation Teachers Group⁵ (2005) accept the following definition of conscious sedation,

"A technique in which the use of a drug or drugs produces a state of depression of the central nervous system enabling treatment to be carried out, but during which verbal contact with the patient is maintained throughout the period of sedation. The drugs and techniques used to provide conscious sedation for dental treatment should carry a margin of safety wide enough to render unintended loss of consciousness unlikely. The level of sedation must be such that the patient remains conscious, retains protective reflexes and is able to understand and respond to verbal commands."

Patient selection is of utmost importance in administering conscious sedation in pediatric dentistry. The American Society of Anesthesiologists (ASA) scale of Physical Fitness (Craig and Skelly, 2004)⁶ may be useful to classify patients when risk is anticipated,

ASA 1: Normal healthy patient

ASA 2: Patient with mild systemic disease.

ASA 3: Patient with severe systemic disease (limits activity).

ASA 4: Patient with severe incapacitating systemic disease.

ASA 5: Moribund patient with poor prognosis (<24 hours).

ASA 1 and 2 patients are generally considered suitable for treatment in a primary care setting. Those falling into categories 3 and 4 should be referred for specialist management, probably in a hospital setting.

OBJECTIVES OF CONSCIOUS SEDATION²

Conscious sedation techniques possess several characteristics that differentiate them from unconscious modalities. In general, conscious techniques:

1. It should alter the patient's mood, thus making him psychologically receptive to dental treatment.
2. It must allow the maintenance of consciousness throughout the procedure.
3. It must result in patient cooperation. Numerous studies carried out at the University of Pittsburgh have shown that chair side productivity is increased by a minimum of 30% when conscious sedation is utilized for dental procedures (Bennett, in preparation).
4. It should raise the pain threshold that is usually beneficial particularly when long appointments are contemplated.

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5. It must allow protective reflexes to remain intact. Studies have shown that maintenance of consciousness is the key to retaining protective reflex function. The production of unconsciousness, even for brief periods, results in dramatic alteration of respiratory and cardiovascular system function.
6. It should produce only small variation in vital signs.
7. It should not require continual monitoring of the patient as needed when carrying out general anesthesia. But still, the patient should be observed for the presence of consciousness and oxygen saturation throughout the procedure.
8. It may produce a variable degree of amnesia.

INDICATIONS FOR CONSCIOUS SEDATION IN PEDIATRIC DENTISTRY

Dental Anxiety

Anxiety is a generalized unpleasant emotion which can occur without the presence of the trigger object or situation, e.g. dental local anesthetic, high speed drill.

Dental anxiety can be measured using psychometric testing with self-report measures such as State- Trait Anxiety Inventory for Children (STAIC, a general anxiety scale)⁷ and the Child Fear Survey Schedule- Dental subscale (CFSS-DS, a dental- specific fear scale)⁷

Fear of specific procedures

Sometimes cooperative children get scared of specific procedures like taking local anesthesia or the sound of air-rotor etc. Nitrous oxide can be of great help owing to its anxiolytic and analgesic properties, in accomplishing these procedures. In a survey by Chanpong B et al⁸ in 2005, the demand for sedation was found to vary from 2% for prophylaxis to 68% for periodontal surgery.

Mentally/ physically disabled or medically compromised patients

Children with special health care needs exhibit severe anxiety when visiting a dental office. It may be caused due to a number of factors including fear of the unknown, inability to communicate one's feelings and reactions to sensory stimuli. The effectiveness of nitrous oxide varies according to the extent and severity of the disability and it should be considered as an option before thinking about deep sedation or general anaesthesia.

Involuntary movement conditions

Various medical conditions, such as Parkinson's disease, Multiple Sclerosis and Cerebral Palsy, affect the child's ability to maintain an open mouth during dental treatment. Conscious sedation often helps in reducing these involuntary movements through muscle relaxation and anxiety reduction.

Routes of administration

Oral

Midazolam is the most commonly used oral agent. It produces earlier sedation, more complete amnesia and improved awakening when compared with diazepam. The onset is 60-90 seconds and the duration of action for small doses is 10-15 minutes.

Oral sedation is easy to administer and monitor, and it costs less. But the level of sedation cannot be easily changed and there is no analgesic effect.⁹

Inhalation

It is a dependable and simple route of drug administration. As a general rule, the drugs delivered through this route have a very rapid onset and short recovery period. Their effect may be rapidly reversed by lowering the concentration of the agent or discontinuing it entirely and administering only oxygen or room air.¹⁰ Nitrous oxide is the most popular agent used through this route. But it has an inherent disadvantage of being the weakest agent available today. Nitrous oxide administration requires special equipment and training. Although it has a wide safety margin, it could prove dangerous and sometimes even fatal at the hands of an untrained individual. Figure-1 shows equipment for inhalation sedation.

Parenteral administration

Intravenous sedation

The standard technique is the use of titrated dose of a single benzodiazepine or opioid, like fentanyl, etomidate and propofol.⁹ The actions can be reversed by using agents like naloxone, a competitive antagonist of opioid receptors and flumazenil, a pure benzodiazepine antagonist.

Other routes include intramuscular and subcutaneous administration. But they are not commonly practiced.

RECOMMENDATIONS

Patient selection

As discussed earlier, the indications for use of nitrous oxide/oxygen analgesia/ anxiolysis include¹¹:

- A child mature enough to understand the procedure, usually older than 7-8 years;
- A fearful or anxious patient;
- Children with special health care needs;
- Child whose gag reflex interferes dental care;
- A patient for whom profound local anesthesia cannot be obtained;
- Lengthy dental procedures.

Review of patient's medical history should be assessed and should include:

	Minimal Sedation (Anxiolysis)	Moderate Sedation/ Analgesia (Conscious Sedation)	Deep Sedation/ Analgesia	General Anesthesia
Responsiveness	Normal response to verbal stimulation	Purposeful response to verbal or tactile stimulation	Purposeful response after repeated or painful stimulation	Unarousable even with painful stimulus.
Airway	Unaffected	No intervention required	Intervention may be required	Intervention often required
Spontaneous ventilation	Unaffected	Adequate	May be inadequate	Frequently inadequate
Cardiovascular function	Unaffected	Usually maintained	Usually maintained	May be impaired

Table-1: Levels of Sedation



Figure-1: Portable Nitrous oxide- oxygen sedation machine with gas tanks. (Welbury R, Dugal MS, Hosey MT. Pediatric Dentistry. 4th edition, Oxford University Press, 2012)



Figure-2: Scavenging nose piece. (Welbury R, Dugal MS, Hosey MT. Pediatric Dentistry. 4th edition, Oxford University Press, 2012)

- History of previous allergic or adverse drug reactions;
- Medications including dose, time, route and site of administration;
- Systemic disorders;
- Previous hospitalization to include the date and purpose.

Contraindications may include:

- Some chronic obstructive pulmonary diseases;
- Drug-related dependencies¹¹;
- First trimester of pregnancy¹²;
- Treatment with bleomycin sulfate¹³;
- Methylenetetrahydrofolate reductase deficiency.¹⁴

Technique

Nitrous oxide/ oxygen should be administered by appropriately trained individuals, or under the direct supervision thereof. Nasal hood of appropriate size should be selected. A flow rate of 5-6 L/min generally is acceptable to most patients. The treatment should be started by administering 100% oxygen for 1-2 minutes should be started followed by titration of nitrous oxide in 10% intervals. And even when nitrous oxide flow is

terminated, 100% oxygen should be delivered for 3-5 minutes.¹⁵

Monitoring

Patient should be clinically observed for responsiveness, colour and respiratory rate and rhythm. Verbal responses provide an indication that the patient is breathing.¹⁶

Documentation

Well drafted informed consent must be taken from the parent or legal guardian and documented prior to administration of nitrous oxide/ oxygen.

Facilities/ personnel/ equipment

Facilities for delivering nitrous oxide/ oxygen must ensure proper gas delivery, fail-safe function and scavenging system prior to use. Inhalation equipment must have a fail-safe system that is checked and monitored regularly according to the latest guidelines and regulations.¹⁷

An emergency cart (kit) must be readily accessible and must be able to accommodate children of all ages and sizes

Occupational safety

The American Association of Pediatric Dentistry recommends minimal exposure to ambient nitrous oxide through the use of effective scavenging systems and periodic monitoring and maintenance of the delivery and scavenging systems.^{18,19}

CONSCIOUS SEDATION GUIDELINES

The American Academy of Pediatric Dentistry adopted a set of clinical guidelines in 2005 (revised in 2009)²⁰ to assist the dental profession in the use of nitrous oxide/ oxygen analgesia/ anxiolysis for pediatric patients.

Nitrous oxide acts as an adequate analgesic and anxiolytic agent causing central nervous system depression and euphoria with minimal effect on the respiratory system. The anxiolytic effect involves activation of GABA receptor either directly or indirectly through the benzodiazepine binding site.²⁰

CONCLUSION

Sedation should be considered as part of management of pain and dental anxiety, to make the treatment a pleasant learning experience. Conscious sedation is a safe method with a wide safety margin that can be used effectively in managing dental fear and anxiety and can reduce the need for general anesthesia. Inhalation sedation using nitrous oxide is the recommended choice for conscious sedation in children. Intravenous sedation should be prescribed carefully and used only in adolescents over the age of 12 years.

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Case of Non Hodgkins Lymphoma Involving the Uterus

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ABSTRACT

Introduction: Among the extranodal sites, uterus is a rare site of involvement by Non-Hodgkin's Lymphoma. We report a case of a woman with Non-Hodgkin's Lymphoma involving the uterus.

Case report: A 40 year old female patient complained of abnormally heavy menstrual bleeding (Menorrhagia). Patient underwent exploratory laparotomy with total abdominal hysterectomy, bilateral salpingo-oophorectomy, resection of small intestinal growth followed by end to end anastomosis and regional lymph node sampling. Histopathology and Immunohistochemistry revealed Non-Hodgkin's lymphoma involving the uterus.

Conclusion: Non Hodgkins' lymphoma involving the uterus should be included in differential diagnosis of uterine neoplasms.

Keywords: Extra-Nodal Non-Hodgkin's lymphoma, Uterus, Menorrhagia.

INTRODUCTION

The incidence of extra nodal NHL is rising.¹ Among the extranodal sites, uterus is a rare site of involvement.² The rarity of uterine lymphoma made a study of a large series of cases difficult, and single or a few sporadic cases of uterine lymphoma have been reported.³ Among the uterine lymphomas the cervix and vagina have been more prevalent sites than the corpus (85% of Japanese and 78% of North American cases).² Moreover, the presentation of uterine lymphoma lacks any specific symptoms⁴ which poses challenge for a clinician to differentiate it from more commonly encountered uterine neoplasms like uterine leiomyoma or sarcoma. This consequently results in delayed diagnosis and thereby, poor prognosis. Moreover, being an uncommon uterine neoplasm, not many randomized trials have been carried out, thus the treatment has not been standardized.

CASE REPORT

The patient was a 40 year old multiparous female who complained of abnormally heavy menstrual bleeding from last 4 months. There was no history of fever, night sweats or weight loss. On general physical examination, there was mild pallor. CT scan of the abdomen and pelvis show a diffuse enhancing mass in the duodeno-jejunal junction and the leiomyoma uterus. Patient underwent exploratory laparotomy with total abdominal hysterectomy, bilateral salpingo-oophorectomy, resection of small intestinal growth followed by end to end anastomosis and regional lymph node sampling.

Pathological findings were

The specimen consisted of uterus, cervix, bilateral adnexa, portion of small gut and lymph nodes. The myometrium showed a grey white area measuring 5cm x 5cm. Representative blocks were taken from the hysterectomy and lymph node dissection specimens, fixed in 10% buffered formalin, and processed in the

usual manner. H and E-stained sections and slides were prepared from paraffin-embedded tissue. Immunohistochemistry was performed.

Microscopically, multiple sections examined from uterus revealed large lymphoid cells infiltrating into myometrium. Immunohistochemistry was negative for CD3 and CD5, and positive for CD20

DISCUSSION

Lymphoma is the commonest hematological cancer and is divided into Hodgkin (20-30%) and non-Hodgkin (70-80%). Non-Hodgkin Lymphoma (NHL) is diverse and often subdivided into aggressive and less aggressive forms. The most common aggressive NHL is Diffuse large B-cell lymphoma (DLBCL). Other aggressive forms of NHL include Peripheral T-cell lymphoma (PTCL), Burkitt's lymphoma, Mantle cell lymphoma (MCL) and AIDS-related lymphoma. The most common among less aggressive forms of NHL is Follicular lymphoma. Other less aggressive forms includes Marginal Zone lymphoma, Small lymphocytic lymphoma and skin lymphomas. There is a wide variation in the clinical picture of NHL.⁵ The Non Hodgkins' Lymphoma presenting with initial manifestations of female genital tract disease are extremely uncommon.⁶⁻⁸ After analyzing data from The Cancer Registries of the End Results Group, Freeman et al. reported only six cases (0.5%) out of 1467 cases of extranodal NHL had uterine involvement (A data from over 100 hospitals in the United States is included in The Cancer Registries of the End Results Group).⁹

CONCLUSION

Although Non-Hodgkin's lymphoma involving the uterus is rare, clinicians, radiologists and pathologists should be aware of this diagnosis and should include it in differential diagnosis of gynaecological neoplasms.

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Figure-1: Gross Specimen of Uterus showing a well circumscribed mass in myometrium.

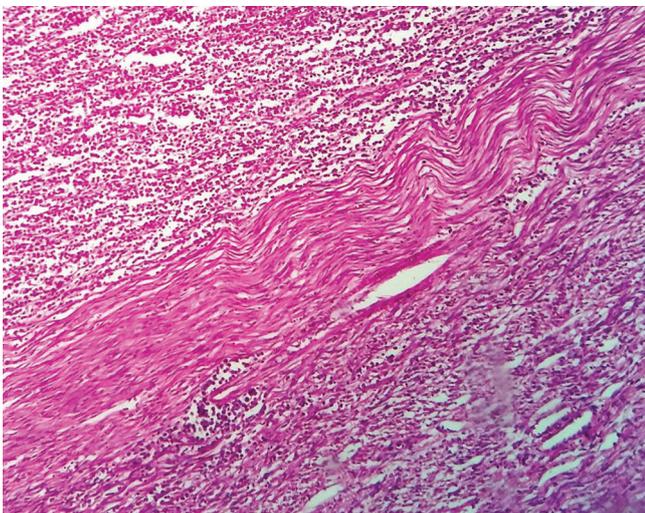


Figure-2: H and E X 100 showing sheets of lymphoid cells infiltrating myometrium.

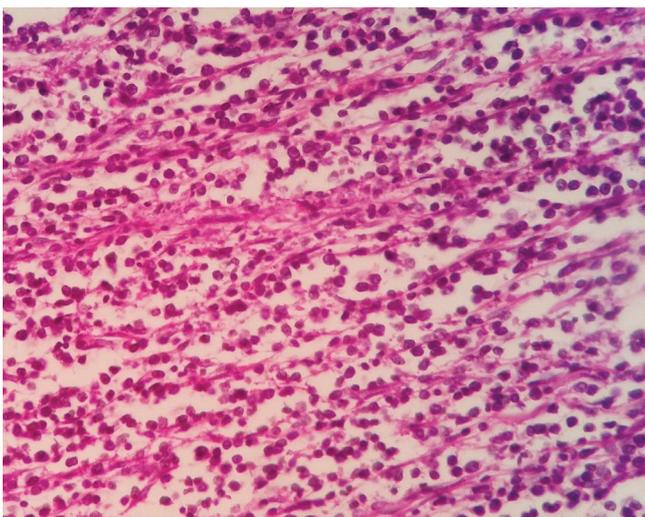


Figure-3: H and E x 400 showing dark hyperchromatic nuclei with scant cytoplasm.

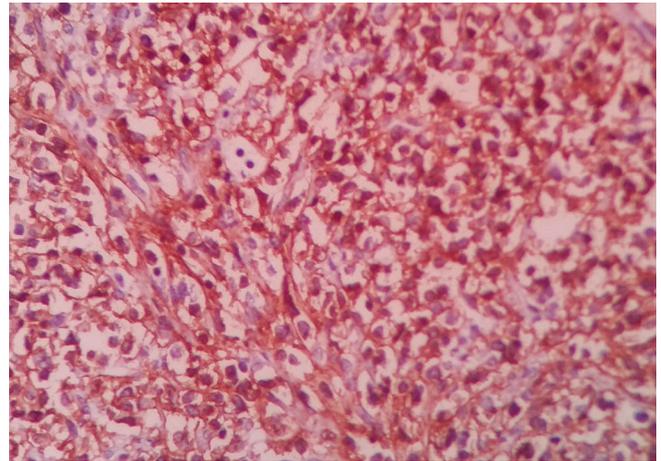


Figure-4: Tumor cells show cytoplasmic and membranous positivity for CD 20

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Comparison of Conventional Lowenstein Jensen Medium and Middlebrook Biphase Medium for isolation of Mycobacterium Tuberculosis

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ABSTRACT

Introduction: For many centuries tuberculosis (TB) has been the most important of human infections in its global prevalence. It remains one of the world's deadliest communicable diseases. The present study was attempted to assess the feasibility of using Middlebrook biphase medium (MB) as primary isolation medium for mycobacteria. It is compared with the Lowenstein Jensen (LJ) medium, which is gold standard, for their recovery and growth rate.

Material and methods: Total 250 sputum samples from clinically diagnosed cases of pulmonary tuberculosis were studied. These were collected from Revised National Tuberculosis Control Programme (RNTCP) Centre of Bharati Hospital, Sangli. All the samples were decontaminated by Petroff's method. Each sample was subjected to ZN staining and it was simultaneously inoculated on both LJ and MB medium (Middlebrook 7H11 agar slant + Middlebrook 7H9 broth) for their recovery from sputum and growth rate i.e. time required for the visible growth of mycobacterium after subculture on both LJ and MB medium. The growth from cultures was confirmed by ZN staining and they were further identified by conventional biochemical tests.

Results: We have evaluated and compared MB biphase system and LJ medium. Biphase system showed the recovery of mycobacteria in 41 samples as against 35 samples on LJ medium after incubation for 28 and 33 days respectively and for growth rate it took 17 and 21 days on MB and LJ medium respectively.

Conclusion: Biphase media requires less days for recovery and growth of *M. tuberculosis*. Hence it is superior to LJ medium for use in clinical Mycobacteriology laboratory.

Keywords: *M. tuberculosis*, LJ medium, Middlebrook Biphase medium (MB), Recovery rate, Growth rate.

INTRODUCTION

For many centuries tuberculosis (TB) has been the most important of the human infections in its global prevalence. It remains one of the world's deadliest communicable diseases.¹ In India the statistics of tuberculosis is calculated as per the Revised National Tuberculosis control programme (RNTCP).² The WHO statistics for 2014 gives an incidence of 2.2 million cases of tuberculosis for India out of a global incidence of 9 million.³ It is estimated that about 40% of the Indian population is infected with *M. tuberculosis*, the vast majority of whom have latent rather than active tuberculosis.¹ Deaths from TB are preventable, if diagnosed and treated early.

Laboratory confirmation and proper follow up is extremely important. Although the introduction of amplification techniques in mycobacteriology laboratory provides faster and more accurate detection of Mycobacterium tuberculosis

complex (MTB), culture still represents a decisive step for diagnosis, treatment and control of tuberculosis. A combination of solid and liquid media is currently regarded as the "gold standard" for primary isolation of mycobacteria. Turnaround time not exceeding 21 to 31 days after specimen collection is recommended for MTB identification and drug susceptibility testing.⁴

Smear and culture is the corner stone of diagnosis of tuberculosis. In India the availability of amplification techniques is still out of reach for the poor in whom tuberculosis is common. We undertook one-year study as an attempt to compare Biphase Middlebrook medium with LJ to find out a medium which has shorter turnaround time and is feasible for use in smaller laboratories.

MATERIAL AND METHODS

Two fifty sputum samples from patients attending RNTCP center in Bharati Vidyapeeth Medical College were studied during a period of one year. These patients were clinically diagnosed as pulmonary tuberculosis. Few had radiological evidence suggestive of tuberculosis. A prior approval of Institutional ethical committee was taken for the study and informed consent was taken from all the patients participating in the study.

LJ medium (Hi media M168) was prepared as per manufacturer's instructions. MB system was prepared in two stages. For the solid phase Middlebrook 7H11 agar (Hi media-M511) was used. The sterile OADC (Hi media) was added into this medium and slants were prepared in 30 ml screw capped bottles as per manufactures instructions.⁵ For the fluid phase Middlebrook 7H9 broth base (Hi media-M198) was used. Glycerol and OADC supplement (Hi media FD019) was added as per manufacturer's instruction.⁶ Sterility test of media were done by incubating them for 72 hours to rule out contamination.⁷ Quality check of the media was done by inoculating H37RV strain of *M. tuberculosis*.⁶

The patients were asked to cough into a sterile wide mouthed container. The specimens were immediately transported to the microbiology laboratory. The sample selection was done according to Barlett's grading system for assessing the quality

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of sputum samples on microscopy. Samples suggestive of lack of evidence of active inflammation or salivary contamination were rejected and a repeat fresh sample was collected.⁸ All the laboratory work was done in inoculation hood and biosafety cabinet. The sputum was subjected to decontamination and concentration by Petroff's technique.²

The ZN smears were prepared from concentrated sputum. 0.5 ml of concentrated decontaminated sputum was inoculated on to LJ medium and both slant and broth of MB medium. The media were incubated aerobically at 37°C. They were inspected daily for contamination for period of 10 days. After a week of incubation, the MB medium was tilted on alternate days for one week for first two weeks and thereafter once a week for inoculating the slant.⁵

Recovery of *M. tuberculosis* was the time of visible growth after inoculation.

LJ medium showed the growth of typical buff colored, raised colonies of *M. tuberculosis* with rough surface. On Biphasic medium translucent tiny colonies appeared on Middlebrook 7H11 agar slant and serpentine cords were seen in Middlebrook 7H9 broth.

ZN smears were prepared from colonies and broth showing growth. The identification of mycobacteria was done by conventional biochemical tests.⁹

Smears were also prepared from broth and media showing no growth to avoid false negative results.

STATISTICAL ANALYSIS

Mean and S.D. of recovery and growth rate in days was calculated. Z test (Standard error of difference between two means) was applied to find out the significant difference in days for recovery and growth rate for biphasic and LJ medium.

RESULTS

Out of total 250 samples studied, 70(28%) samples showed presence of acid fast bacilli in ZN staining and 180(72%) samples were negative for acid fast bacilli (Table-1). Out of 250 sputum samples, the growth of mycobacteria was obtained on total 35 LJ media (Figure-1) and 41 Biphasic media (Figure-2). In 41 samples growth was obtained by the 5th week of incubation on middlebrook Biphasic medium, whereas only 13 cultures were positive on LJ by 5th week. For the rest 21, it took 6 weeks for the bacteria to grow on LJ medium (Table-2). All these isolates were further confirmed as *M. tuberculosis* by standard biochemical tests. In our study we did not find any nontuberculous mycobacteria.

Table-3 shows the number of days required for recovery of *M. tuberculosis*. The recovery days were calculated by taking mean of recovery days of all the samples showing growth on LJ and Biphasic media. Statistical analysis using unpaired t test was done. P value is calculated. There is a statistically significant difference in mean days for recovery on BP and LJ, i.e. Mean recovery days for biphasic medium were significantly less than LJ medium for *M. tuberculosis* (P=0.002). This shows that biphasic media requires less days for recovery.

Mean days required for growth of *M. tuberculosis*. (I.e. time required for growth after subculture) on biphasic media were 16.59 while that on LJ medium were 21.17. There is a statistically significant difference in mean days for growth on

BP and LJ medium (P=0.000) (Table-4). i.e. growth was earlier in biphasic medium than in LJ medium.

DISCUSSION

Tuberculosis still remains a major health problem in India. It accounts for 30% of global TB Burden.¹⁰ It is the most common cause of death due to single infectious agent. Rapid diagnosis is important for treatment and containment of the disease. Now a days rapid tests like BACTEC, septic check AFB system and MGIT have become available, but not so commonly in rural settings. The high cost of these methods is a major hurdle.

Microscopy and culture still form the corner stone of diagnosis of tuberculosis. Hence we worked on a system which has a shorter turn over time for recovery and growth of *M. tuberculosis*. The conventional LJ medium was compared to composite MB system for recovery. The present study was attempted to assess the feasibility of using biphasic medium as primary isolation media for mycobacteria i.e. recovery and its growth.

In our study a total of 250 cases of pulmonary TB from RNTCP were studied. The most common presentation was fever and cough seen in 144(69.4%) of the cases followed by weight loss 40(16%). Out of these 31 (12.4%) had radiological evidence of

Total no. of sputum samples	Positive	Negative
250 (100%)	70 (28%)	180 (72%)

Table-1: ZN Staining- Smear findings



Figure-1: Growth of *M. tuberculosis* on LJ



Figure-2: Growth of *M. tuberculosis* on Middlebrook Biphasic medium (MB)

ZN staining (Smear grading)	Scanty		+		++		+++		Total no. of Smear positive sputum samples		Total no. of Smear negative sputum samples	
Total no. of sputum samples n=250	8(11%)		31(44.2%)		17(24.28%)		14(20%)		70		180	
Positive in days(week)	L J	MB	L J	MB	L J	MB	L J	MB	L J	MB	LJ	MB
7 days (1 st week)	-	-	-	-	-	-	-	-	-	-	-	-
14 days (2 nd week)	-	-	-	-	-	-	-	-	-	-	-	-
21 days (3 rd week)	-	-	-	01	-	01	-	03	-	05	-	-
28 days (4 th week)	-	02	01	03	02	02	02	01	05	09	-	01
35 days (5 th week)	02	02	03	09	01	08	01	06	08	27	1	2
42 days (6 th week)	01	-	07	-	06	-	05	-	21	-	2	-
49 days (7 th week)	01	-	-	-	-	-	-	-	01	-	-	-
Total	04	04	11	13	09	11	08	10	35	41	03	03

L J - Lowenstein Jensen Medium, MB- Middlebrook biphasic medium

Table-2: Recovery of *M. tuberculosis* in L J and Middlebrook Biphasic medium from sputum

Recovery in days		
	Biphasic medium	L J medium
Mean	27.76	33.31
S.d.	8.10	7.57
Z value	3.014	
P value	0.002	

Table-3: The table shows the number of days required for recovery of *M. tuberculosis*. The recovery days were calculated by taking mean of recovery days of all the samples showing growth on LJ and Biphasic media.

Growth in days		
	Biphasic medium	L J medium
Mean	16.59	21.17
S.d.	1.79	1.53
Calculated Z value	12.210	
P value	0.000	

Table-4: Table shows the mean days required for growth of *M. tuberculosis*. (I.e. time required for growth after subculture) on LJ and Biphasic media.

tuberculosis.

Out of 250 clinical cases, on ZN staining sputum smear positivity was 28% (70samples) and 72 % (180 samples) were found to be negative on microscopy (Table-1). Percentage of smear positivity is differently reported by different workers accounting for 23% to 62.9% respectively.^{5,11} Bacilli are shed out in sputum when a necrotic caseating cavitory lesion communicates with the airway. Moreover, it requires 10,000 bacilli per ml of sputum for the ZN smear to be positive.¹² The grading of the smears gives us an idea of the bacterial load. More the number of bacilli more is the infectivity of the patient. It depends upon variety of factors such as the time of collection, the number of samples which are taken, the nature of the samples, the treatment with antituberculous drugs, its duration and the method of grading which was used.¹³ In our study, a large number of patients were on the antitubercular treatment for variable time periods. This might have had impact on the bacterial load and the culture positivity. Majority of patients were 1(+) i.e. 31(44.2%) which ranked highest (Table-2). Only 12% had radiological evidence of tuberculosis.

On comparing the recovery of the bacilli from sputum, *M. tuberculosis* could be recovered from 41 sputum samples in MB

medium and only in 35 samples on LJ medium. In 6 sputa the growth was negative on LJ medium. In 3 ZN smear negative samples the culture came positive in both LJ and MB, but in LJ they were recovered one week later than MB. (Table-2)

The LJ medium did not support any growth as early as 3 weeks whereas in 5 specimens growth of *M. tuberculosis* was obtained on MB medium in 3 weeks from specimens. All 41 cultures were positive by 5 weeks in MB whereas only 13 cultures (5 in 4th week and 8 in 5th week) were positive on LJ. For rest 21 it took 6 weeks for the bacteria to grow on LJ medium. So there is a considerable time lag between growth in MB and on LJ. This difference in recovery time was statistically significant. (Table-3) This may be due to the use of liquid phase, which permits an increase in concentration of an initially small number of bacteria in the broth to serve repeatedly as inoculum for the agar surface in MB biphasic medium.

The rate of growth of all 41 strains when sub cultured on both media also showed significantly earlier growth in MB Biphasic medium (Table-4). i.e. *M. tuberculosis* was grown almost 6-7 days earlier in biphasic medium as compared to LJ medium after subculture. This difference in growth rate in both media is also statistically significant.

CONCLUSION

We feel that MB Biphasic medium could be well adapted for early recovery of *M. tuberculosis* with ease of performance and reliability. It does not require gas supplies or radioactive tracers and enables recovery of the mycobacteria without special equipment in small and peripheral laboratories. With further additional studies, its use can be upgraded for susceptibility testing also.

It is not only comparable with the conventional LJ medium, but significantly better for recovery and growth of *M. tuberculosis*. It is safer and self-contained and can be used easily in rural laboratories.

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A Study to Show Postprandial Hyper Triglyceridemia as A Risk Factor for Macrovascular Complications in Type 2 DM

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ABSTRACT

Introduction: Triglyceridemia is an independent risk factor for coronary artery disease irrespective of total cholesterol and LDL cholesterol or low HDL cholesterol. Various publications have challenged this practice citing postprandial hyper-triglyceridemia as a risk for cardiovascular events.

Material and methods: Two hundred patients with Type 2 diabetes for more than one year between the age group of 30-65 years in this study and 50 healthy subjects without any coincidental illness were selected as controls. Each patient underwent detailed clinical history, physical examination and investigations. Blood samples were taken after 2 hours to measure the postprandial blood glucose levels and triglyceride levels; a third blood sample was collected 4 hours after the meal to measure postprandial triglycerides.

Results: Among the total 200 patients 66 were males (66%) and 34 were females (34%). In the group 1 of the 100 patients were males (68%) and 32 were females (32%). In the group 2 of the 100 patients 64 were males (64%) and 36 were females (36%). In the group 3 of the 50 patients 34 were males (68%) and 16 were females (32%). It was found that there was not much in fasting triglyceridemia; while there was significant difference in patients with evidence of coronary heart disease.

Conclusion: Our results showed that TG levels peaked 4 h after the standardized high-fat meal, corroborating previous studies.

Keywords: Coronary artery disease, Post-prandial triglycerides, Type 2 Diabetes Mellitus

Atherosclerosis is a multifactorial disease where atherosclerosis and dyslipidemia are the prominent causes involved.¹⁰⁻¹³ It has been proposed that postprandial lipoproteins may be better indicators of deranged lipoprotein metabolism and hence of atherosclerosis and CHD.¹⁴⁻¹⁷ When the fat content in a test meal increased from 25 to 45%, pTG levels only increased by 10%.^{10,11} This result implies that a special test meal is not necessary for the evaluation of postprandial hypertriglyceridemia. Because we wanted to investigate whether pTG levels were associated with atherosclerosis in normal daily life, we gave our subjects a test meal that resembled their daily diets.

We aimed to investigate the role of postprandial hypertriglyceridemia in type 2 diabetic patients with and without macrovascular disease and establish their role as a risk factor for macrovascular complications.

MATERIAL AND METHODS

This case control study was done at SVS Medical College and hospital, Mahabubnagar in Telangana State between 1-8-2012 and 31-7-2014. Two hundred patients with Type 2 diabetes for more than one year between the age group of 30-65 years in this study and 50 healthy subjects without any coincidental illness were selected as controls. The cases were sub divided into two groups based on the history of macrovascular complications. Group I comprises of patients with type 2 diabetes mellitus with history of macrovascular complications such as ischemic heart disease and or cerebrovascular disease, Group II comprises of patients with type 2 diabetes mellitus, of more than 1-year duration without evidence of ischemic heart disease, cerebrovascular disease and peripheral vascular disease, Group III comprises of normal healthy age and gender matched

INTRODUCTION

Triglyceridemia is an independent risk factor for coronary artery disease irrespective of total cholesterol and LDL cholesterol or low HDL cholesterol.¹ ATP III guidelines² suggest at least 9 hour fasting before estimating lipid profile. Many studies did not agree with this practice. Although this association is not entirely certain, it does raise into question the requirement for obtaining fasting lipoprotein measurements.^{2,3}

Raised Triglyceride levels are associated with macrovascular complications has not been investigated in diabetic patients. Further studies have shown postprandial hyper-triglyceridemia as a risk factor for developing cardiovascular events and thus posing a question of whether it is really necessary to obtain fasting lipids.^{4,9} Nordestgaard et al¹⁰ established the direct correlation of non-fasting TG and the risk of myocardial infarction, ischemic heart disease, and death in 7,587 women and 6,394 men. The most interesting part is that non-fasting triglycerides levels may be even better predictor of cardiovascular risk as compared to fasting triglycerides.^{4,10} According to Patsch et al¹¹ (1992), the postprandial but not fasting TG levels exhibited an association with CAD that was statistically independent and stronger than that of HDL-cholesterol.¹¹

Complication	Group-1: Diabetes with complication	
	Number	%
MI	28	28
CVA	32	32
Both	40	40
Total	100	100

Table-1: Distribution of subjects based on complication in group 1

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Parameter	Grp-1: Diabetes with complication		Grp 2: Diabetes without complication		Grp 3: Controls	
	MEAN (mg/dL)	SD	MEAN (mg/dL)	SD	MEAN (mg/dL)	SD
FBS	205.2	71.4	150.6	26.6	85.1	9.07
PPBS	294.68	103.48	204.16	45.62	114.44	13.8
Urea	29.64	5.2	27.92	3.55	26.8	2.91
Creatinine	1.07	0.19	0.89	0.14	0.84	0.16
Total Cholesterol	196.6	32.9	176.2	30.17	156.8	19.08
Triglyceride Fasting	223.43	61.8	199.6	56.9	126.08	24.86
HDL	31.8	7.5	31.6	6.69	44.92	5.23
LDL	120	30.2	103.29	28.3	86.6	21.7
VLDL	44.6	12.3	39.9	11.3	25.2	4.97
Triglyceride Post Fat Meal	407.2	109.8	337.6	80.7	211.3	40.8

Table-2: Mean ± SD values of studied parameters in Diabetes with complication, diabetes without complication and controls.

Parameter	Grp-1 vs Grp 2 vs		Grp 2 vs
	GRP 2	GRP 3	GRP 3
FBS	<0.001	<0.001	<0.001
PPBS	<0.001	<0.001	<0.001
Urea	0.322	0.049	0.616
Creatinine	0.002	<0.001	0.605
Total Cholesterol	0.042	<0.001	0.057
Triglyceride Fasting	0.257	<0.001	<0.001
HDL	0.994	<0.001	<0.001
LDL	0.097	<0.001	0.102
VLDL	0.259	<0.001	<0.001
Triglyceride Post Fat Meal	0.014	<0.001	<0.001

Table-3: ANOVA multiple comparison of significance

patients without any history of diabetes, or any evidence of risk factors. Blood drawn from the cases on fasting, 2 and 4 hours after normal food. Serum was used to measure total cholesterol, triglycerides, HDL Cholesterol, LDL cholesterol, serum Urea, Serum Creatinine, fasting blood glucose levels. The patients were given regular normal diet. Blood samples were taken after 2 hours to measure the postprandial blood glucose levels and triglyceride levels; a third blood sample was collected 4 hours after the meal to measure postprandial triglycerides. All these cases subjected to clinical examination and routine investigations. The subjects below 30 years and above 65 and new diabetic cases were excluded from this study.

STATISTICAL ANALYSIS

Data obtained was analyzed by SPSS statistical software (v 17.0) ANOVA was used to compare the 3 groups and significance was estimated using the F value in between different groups. Other statistical tests such as x²-test (Chi square test) were applied for nominal data. The level of significance was estimated by applying the, probability value (p). p < 0.05 was taken as significant and < 0.01 was taken as highly significant.

RESULTS

The patients had a minimum age of 30 years to a maximum of 63 years. The mean age of the patients in the three groups were not significantly different from each other (F = 0.25, p > 0.05). Chi square value was 0.12 with a 'p' value greater than 0.05 was noticed amongst the three groups. The mean BMI was significantly more in group 1 compared to group 3 (p = 0.039) there was no significant difference in the mean BMI between group 3 and group 2 (p = 0.118), group 2 and group 1 (p = 0.878).

In group 1, 28 patients (28%) had suffered with MI as the complication, 32 patients (32%) had suffered with cerebrovascular accident (CVA) as the complication and 40 patients (40%) had suffered with both MI and CVA as the complication.

The mean values for FBS, PPBS, and total cholesterol, Creatinine and post meal triglycerides are significant higher in diabetes with complication group compared to diabetes without complication and controls. The mean values of fasting triglycerides, LDL, VLDL was not significantly higher in diabetes with complication group compared to diabetes without complication.

In order to assess the maximum sensitivity, specificity, and diagnostic efficiency of triglycerides in identifying abnormality the best cut off values are calculated using ROC analysis. Best cut off values are established by selecting a point closer to top left hand curve that provides greatest sum of sensitivity and specificity as shown in table-4. Diagnostic efficiency is defined as the portion of all currently classified as having or not having complications.

$$\text{Diagnostic efficiency} = \frac{\text{True Positive} + \text{True Negative}}{\text{Total No. Of Patients Evaluated}}$$

Best cut off values for different parameters along with sensitivity, specificity and diagnostic efficiency values for group 1 and group 2 are presented in table-4.

At 167.5 mg/dl fasting triglycerides levels were able to differentiate presence of complications in diabetes with 88 % sensitivity and 40 % specificity compared to post prandial triglycerides which had 80% sensitivity and 60 % specificity and an overall diagnostic efficiency of 70 % at 325 mg/dl.

DISCUSSION

Usually TG levels were estimated I fasting state, but many a study proved post prandial TG was more harmful. This testing of post prandial TG levels was cumbersome and not practical routinely in routine practice. Obesity by itself is considered a predictor of adverse lipid metabolism alterations on fasting state; however, few studies correlated the obesity with postprandial TG lipid profile. Our results showed that TG levels peaked 4 h after the standardized high-fat meal, corroborating previous studies [18 and 4] (Boquist et al.¹⁸ 1999, Bansal et al.⁴ 2007). Stampfer and colleagues¹⁹ (1996) showed that plasma TG levels measured 3 to 4 h after a meal were better than fasting plasma TG levels at predicting future cases of myocardial infarction. Some studies showed post prandial increase in normal

Parameter	Best cut off values	Sensitivity	Specificity	Diagnostic efficiency
Duration of diabetes	7.2yrs	80 %	84 %	82%
Triglycerides fasting	167.5 mg/dl	88%	40%	64 %
Triglycerides post fat meal	328.5 mg/dl	90 %	86 %	86%

Table-4: Best cut off values, diagnostic efficiency, sensitivity, specificity, in discriminating diabetes with complication and diabetes without complication.

Study	Group I	SD	Group II	SD	Group III	SD
Teno et al ²⁴ (2000)	3.04 mmol/ L	1.24	1.41 mmol/ L	0.24	1.25 mmol/ L	0.45
Madhu et al ²⁵ 2005	187.1 mg/dL	63.45			156.85 mg/dL	76.57
Nordestgaard et al ¹⁰ 2007	177.0 mg/dL, males		265.5 mg/dL, females			
V Kumar et al ²⁶ 2008	145.0 mg/dL	85.3	93.3 mg/dL	25.8	95.8 mg/dL	22.4
Rathore et al ²⁷ 2014	2.24 mmol/ L	0.51			1.28 mmol/ L	0.16
Kavitha et al ²⁸ 2015	200 mg/dL					
Present study	223.43	61.8	199.6 mg/dL	56.9	126.08 mg/dL	24.86

Table-5: Earlier studies compared with the present study of Fasting triglyceride levels

Study	Group I mg/dL	SD	Group II mg/dL	SD	Group III mg/dL	SD
Teno et al ²⁴ 2000	4.41 mmol/L	2.67	2.96 mmol/L	0.48	1.30 mmol/L	0.50
Madhu et al ²⁵ (2005)	549.68 mg/dL	38.24			294.75 mg/dL	17.6
Nordestgaard et al ¹⁰ (2007)	264.6 males		353.1 females			
V Kumar et al ²⁶ (2008)	346.5 mg/dL	48.04	206.0 mg/dL	66.4	121.4 mg/dL	25.4
Rathore et al ²⁷ 2014	3.21±0.76				2.28±0.17	
Kavitha et al ²⁸ 2015	250					
Present study	407.2 mg/dL	10.8	337.6 mg/dL	80.7	211.3 mg/dL	40.8

Table-6: Earlier studies compared with the present study of Post lipid meal triglyceride levels

individuals. In 2003, So²⁰ and colleagues have characterized patterns of lipid profile changes postprandially in healthy Filipino volunteers after oral fat challenge test. This study showed that triglyceride levels have increased to peak levels up to 274 to 310 mg/ dL at 4 to 5 hours after a high fat meal. At the same the same study showed serum LDL levels decreased after meals.²⁰ Ginseberge²¹ et al thought that a delay in clearance of TG- rich particle may cause the TG elevation after meal. Bravo²² and others had stated a reference interval values for nonfasting TG as follow (in mmol/L): healthy < 2.0 (2 × 88.5); intermediate 2.1 to 2.7; altered > 2.8; but this observation was not on patient with any cardiovascular disease. All the postprandial TG values up to the 12th hour of observation was significantly higher than the baseline at a range of 23.86 to 72.02 mg/dL (0.27 to 0.82 mmol/L). Boccalandro et al,²³ had shown post prandial elevation was more relevant in ischemic heart diseases as compared to healthy cases. Tables 5 and 6 show the comparison of the present study with earlier available studies.

CONCLUSION

It has been noticed in our study the importance of post prandial TG levels and this finding was consistent with many earlier studies. There has been a lot of studies in support of this finding. We recommend a pp TG estimation in evaluation CAD especially in diabetic cases. a paradigm shift in the diagnosis and management of dyslipidemia seems to be inevitable. A random lipid level determination at clinic, especially 4 hours after normal meals is an ideal way to know the risk of CAD in T2 DM cases. We recommend that in future studies, a larger population size be recruited to represent the general population and in cases with already established CAD.s. A series of studies on high risk patients that would document recurrence of CV

events despite their compliance to the standard dyslipidemia treatment and normal fasting lipid profile, will further strengthen the importance of postprandial lipemia.

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A Light Weight Ocular Prosthesis Fabricated by A Simplified Technique: An Eye in a Day

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ABSTRACT

Introduction: Solid ocular prosthetic devices have considerable weight which is borne by the lower eye lid. A light weight ocular prosthesis can thus promote patient comfort by allowing longer duration of wear. Conventional techniques are time consuming requiring a number of clinical and laboratory procedures.

Case report: This paper reports a case in which prosthetic rehabilitation of lost left eye was done with an innovative light weight ocular prosthesis which was delivered in a single appointment by taking the advantage of viscoelastic tissue conditioner as an impression material.

Conclusion: The light weight ocular prosthesis promotes patient comfort permitting long duration of prosthesis wear and the simplified technique of fabrication reduces the clinical time needed and minimizes a number of laboratory procedures.

Keyword: Ocular prosthesis

INTRODUCTION

Solid ocular prosthetic devices have considerable weight which has to be borne by lower eyelid which may cause laxity of the eyelid in the long term. Construction of a hollow ocular prosthesis can solve this problem by reduction in the overall weight of the prosthesis by as much as 26%.¹ In addition the light weight ocular prostheses promotes patient comfort by allowing long duration of wear.

Various impression materials such as dental compound, dental waxes, irreversible hydrocolloid and elastomeric impression materials have been used to record the eye socket. These impression materials are used to modify the tissue surface of stock eye so as to improve its adaptation to the mobile tissue bed. The impression material in such instances undergoes conversion to acrylic resin in the laboratory resulting in a customized stock eye.

The limitation of the currently used impression materials is that it is not well tolerated when in prolonged contact with the soft tissues. Tissue intolerance may occur when the impression materials are left on the tissue side of stock eye for a prolonged period of time for the purpose of assessment. Irreversible hydrocolloid and elastomeric materials have an additional problem that these materials do not adhere well to the stock eye and use of mechanical undercuts or a chemical adhesive may be required.

Conventional techniques for fabrication of an ocular prosthesis are time consuming requiring a number of clinical and laboratory procedures.

This case report describes a technique in which a light weight ocular prosthesis can be delivered in a single appointment taking the advantage of viscoelastic tissue conditioner as an impression material.

CASE REPORT

A 40 year old male patient reported to the department of

prosthodontics for prosthetic rehabilitation of his lost left eye. His right eye had normal vision. On eliciting history, it was found out that at the age of 8 years the patient had sustained an injury to his left eye by a bullet of a toy gun for which he was treated by surgical evisceration of the eye. Clinical examination revealed a completely healed left eye socket. Patient had no relevant medical history.

Procedure

A suitable stock acrylic resin eye was selected. The dimensions and colour of iris-pupil complex and sclera similar to the contralateral normal eye was selected. The size, shape, and outline of the stock eye was selected according to the socket dimensions.

The stock ocular prosthesis was modified to be used as a custom tray. The periphery of the prosthesis was trimmed to fit the eye socket. The prosthesis was oriented to the desired visual axis by adding baseplate wax to the periphery.² The ocular prosthesis may be further shaped on its corneal surface by addition of baseplate wax to achieve normal eyelid posture if required. An orangewood stick was attached to center of iris by using sticky wax.

A tissue conditioner supplied as powder and liquid (Viscogel, De Trey Division, Dentsply Ltd., Surrey, England) was used as an impression material and was mixed according to manufacturer's instructions. The gel was applied to the tissue surface of the prosthesis in an even layer to fill the space between the prosthesis and tissue bed. The prosthesis was inserted in the eye socket and maintained in situ for about 20 minutes.

The visual axis of the prosthesis was controlled by holding the orangewood stick as gelation of impression material takes place. (Prior orientation of the prosthesis with appropriate reduction or wax additions to the periphery, may allow unassisted axial orientation of the prosthesis in the socket.) The patient was instructed to gaze ahead at a distance and to shut the eyelids intermittently. (Having the patient gaze ahead helps fix the position of the tissues of the socket and aligns the axes of both pupils. Closure of eyelids enables the patient to express fluid from lacrimal glands, which helps reduce dehydration and discomfort of the eye socket).³ After the material sets, the impression surface was evaluated. (figure 1a)

Instead of fabricating a master cast and a wax conformer, the same stock eye lined with tissue conditioner was used for try-

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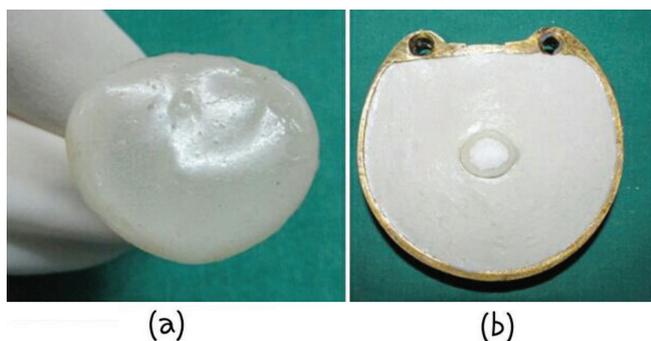


Figure-1: (a) Impression made using tissue conditioner as impression material; (b) Lost salt technique followed by adding appropriate amount of salt to tissue side of stock eye.

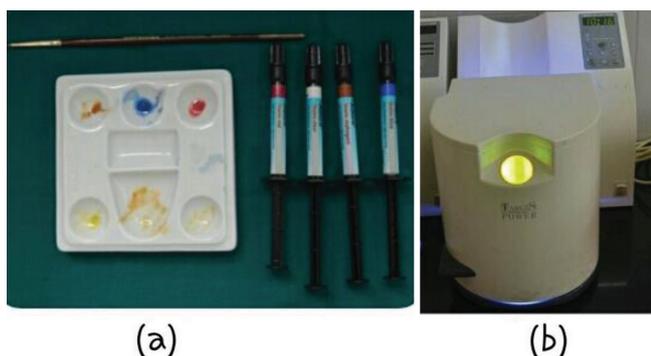


Figure-2: (a) Painting of the sclera with SR Adoro light cure stains; (b) Targis power light curing unit.

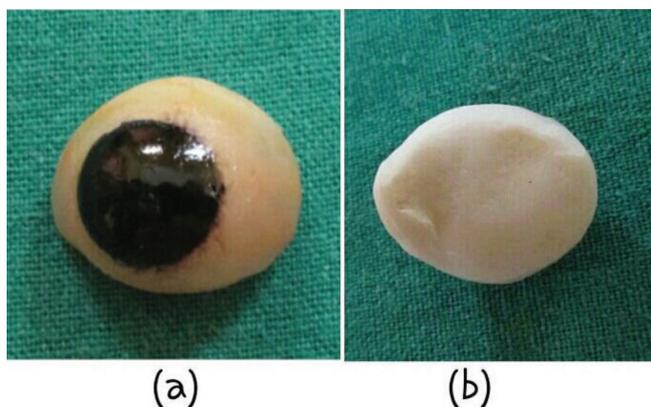


Figure-3: Completed Light weight ocular prosthesis. (a) Anterior view (b) Posterior view.

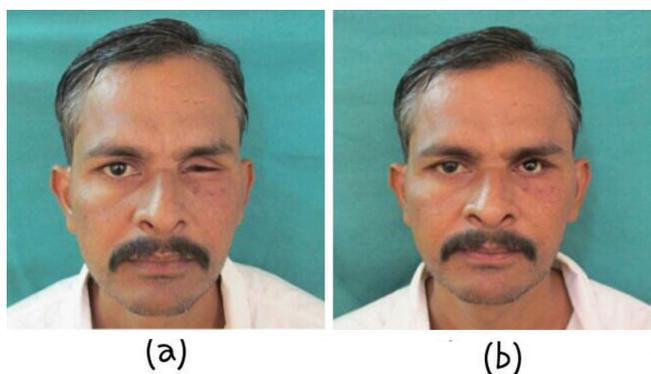


Figure-4: (a) Pre-operative photograph; (b) Postoperative photograph.

in. Factors such as lid support, iris position and orientation of visual axis were evaluated.

The stock eye lined with tissue conditioner was invested in dental flask. Upon separation of the flask, the tissue conditioner layer was separated from the stock eye. Lost salt technique was used to reduce the weight of the prosthesis by placing appropriate amount of salt on the tissue side of the stock eye (figure 1b), packing was done with a mixture of clear heat cure acrylic and zinc-oxide powder to achieve a whiter shade. Acrylization was done following which the prosthesis was retrieved and finished and polished.

Try-in of the prosthesis was done to check for extent, fit, comfort and iris position.

Charcterization was done with the help of SR Adoro light cure stains and Targis power light curing unit so as to match the shade with the contralateral eye (figure 2 a,b). (Ivoclar vivadent SR adoro stains are urethane dimethacrylate (47-48wt%) and silicon dioxide (49-50 wt %). These stains are routinely used for characterization of acrylic denture teeth. These stains are cured in the Targis power light curing unit by prepolymerizing for one and a half minute and final curing of 16 minutes at a temperature of 104°C.)

Optiglaze protective coating agent was applied to protect the characterization.

The prosthesis was delivered to the patient. (figure 3 and 4)

DISCUSSION

Conventional techniques require about 4-5 appointments for construction of ocular prosthesis in addition to the lab procedures involved. However the technique presented in this case report allows the ocular prosthesis to be delivered in a single appointment. This reduces the clinical time needed and minimizes the lab procedures involved. A large variety of stock eyes should be available for this technique so that proper shade matching can be achieved.

Light weight ocular prosthesis reduces the weight which is borne by the lower eyelids thus promoting patient comfort for long duration of wear and minimizes the possibility of laxity of lower eyelids. Lost salt technique described is a simple method to hollow out the prosthesis. However this technique cannot be used in shallow sockets.

Tissue conditioner was used as an impression medium. It has the advantages of biocompatibility and ease of manipulation. Its nontoxic constituents are observed to be well tolerated by conjunctival or corneal epithelia and oral epithelia.^{4,5} It provides a comfortable and healthy soft tissue response. Its biocompatibility permits the continued clinical use and the evaluation of ocular prosthesis, over an extended period (24 to 48 hours). The tissue conditioner gel is soft and has good flow characteristics that help to register the surface detail of the eye socket. Its softness and elasticity allows physiologic compression of the tissue bed during extended prosthetic use. The tissue conditioner impression material adheres well to ocular prosthesis, without the need for mechanical retention or chemical adhesive.⁶

However it may have disadvantages such as initial irritation to the conjunctivae if ethyl alcohol in the liquid is not thoroughly incorporated into the polyethyl methacrylate powder. If mixed in thick consistency and added excessively to the prosthesis, it may produce a protruded or exophthalmic ocular prosthesis. If soft tissue dehiscence is present over the implant, the tissue

conditioner may adhere to an exposed ocular implant made of acrylic resin or hydroxyapatite material. For this situation, the soft tissue dehiscence is repaired surgically before the impression is made. Most tissue conditioners are slightly fungicidal because of their alcohol content but once the alcohol has leached out, the material may harbor candida.⁵ The tissue conditioner as an impression material should be converted to acrylic resin within 24 to 48 hours of use for the material to attain elasticity, preserve its accuracy, and avoid deterioration of its properties. Resin based stains (SR Adoro) have been used for characterization and to match the natural eye colour. Ivoclar vivadent SR Adoro stains are nothing but urethane dimethacrylate (47-48wt%) and silicon dioxide (49-50wt %) and these stains are routinely used for characterization of acrylic denture teeth. These stains are cured in the Targis power light curing unit, first prepolymerized for 1 ½ minute and final curing of 16 minutes creating a temperature of 104°C. They have a better handling properties compared to acrylic paints and have been able to provide excellent esthetic results. Optiglaze protective coating agent was applied to protect the characterization.

CONCLUSION

This article describes a technique in which a light weight ocular prosthesis can be delivered in a day taking the advantage of viscoelastic tissue conditioner as an impression material. The light weight ocular prosthesis promotes patient comfort permitting long duration of prosthesis wear and the simplified technique of fabrication reduces the clinical time needed and minimizes a number of laboratory procedures.

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Serum Vitamin B₁₂ (vit B₁₂) and Serum Magnesium Status in Patients with Long Term Proton Pump Inhibitors (PPI) Use: A Cross Sectional Study done at Tripura Medical College and Dr. BRAM Teaching Hospital

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ABSTRACT

Introduction: Proton pump inhibitors are seen to affect the serum vitamin B₁₂ and potassium levels. The aim of this study was to determine whether long-term proton pump inhibitor use (more than two years) was associated with an abnormal serum vitamin B₁₂ and serum magnesium status in the body.

Material and Methods: This prospective cross-sectional study enrolled 60 proton pump inhibitor (PPI) users, mean age: 50.78 (SD-10.14) years. Demographic data, serum levels of magnesium, vitamin B₁₂ and potassium were recorded. The reference level used for serum magnesium, vitamin B₁₂ and potassium were (1.8-2.4 mg/dl), (211-911 pg/ml), and (3.5-5.5 mEq/L) respectively.

Results: Among the enrolled 60 PPI users, the prevalence of low serum magnesium and low serum vitamin B₁₂ levels were 16 (26.67%) and 4 (6.67%) respectively. Mean PPI use was 5.123 years. From our study it was found that Low serum vitamin B₁₂ was associated with PPI use of more than four years whereas, low serum magnesium level was found irrespective of duration of PPI use.

Conclusion: Hypomagnesemia is common in long term PPI use and low vitamin B₁₂ is associated with more prolonged use.

Keywords: Food and Drug Administration, Clostridium difficile, Cardiac arrhythmia, Transient receptor potential melastin, Hypokalemia, Achlorhydria.

INTRODUCTION

Proton-pump inhibitor (PPI) drugs (e.g. Omeprazole, Esomeprazole, Lansoprazole, Pantoprazole and Rabeprazole) are potent inhibitors of gastric acid secretion which blocks the hydrogen-potassium adenosine triphosphatase enzyme system (the 'proton pump') of the gastric parietal cell.² They are widely used for the treatment and prevention of dyspepsia, associated with peptic ulcer disease, esophagitis and gastritis. Although they are well tolerated, they can have serious side effects. PPI therapy, by decreasing gastric acidity, can increase the risk of gastro-intestinal infections like Clostridium difficile enterocolitis.² Recent reports reported that the long term use of PPI induces hypomagnesemia.^{4,5} On March 2, 2011, the U.S. Food and Drug Administration (FDA) issued a drug safety alert regarding long-time PPI use can cause low levels of serum magnesium.⁶

The postulated mechanism of PPI-induced hypomagnesemia involves inhibition of intestinal magnesium absorption through transient receptor potential melastin (TRPM) 6 and 7 cation channels.⁷ Severe hypomagnesemia can cause tetany, malignant cardiac arrhythmias, generalized seizures, and other metabolic disturbances i.e. hypokalemia and hypocalcemia.⁸

Vitamin B₁₂ (cobalamin) is an essential water-soluble nutrient

acquired from animal-derived food sources meats, poultry, eggs, fish, shellfish and dairy products. Absorption of Vitamin B₁₂ requires peptic enzymes to cleave dietary B₁₂ from dietary proteins. This is primarily done by pepsin, which requires gastric acid to activate pepsin from its pepsinogen precursor. Vit B₁₂ absorption starts with peptic cleavage in the stomach, at acid pH of food-bound B₁₂, which then binds to salivary R protein⁸⁻¹¹ in the duodenum; pancreatic enzymes release R-protein-bound B₁₂, which binds to IF. The B₁₂-IF complex is absorbed in the terminal part of the ileum after binding to its receptor, cubilin.¹² Absorbed vit B₁₂ from ileum is cleaved from IF by cathepsin L and then transported in the blood bound to transcobalamin II. An enterohepatic cycle promotes the conservation of vit B₁₂.¹³ Without gastric acid, vit B₁₂ would not be cleaved from dietary protein and would not be able to bind with R-proteins, which protect vit B₁₂ from pancreatic enzymes. It has been hypothesized that since gastric acidity is essential for vit B₁₂ absorption, acid suppression by PPI can lead to malabsorption and ultimately vit B₁₂ deficiency from achlorhydria and atrophic gastritis.¹⁴ Aim of the study was to investigate whether long-term proton pump inhibitor use (more than two years) was associated with an abnormal serum vitamin B₁₂ and Magnesium status in body and also to evaluate the duration of PPI use and its association with hypomagnesemia and low Vit B₁₂.

MATERIAL AND METHODS

This cross sectional study was done over a period of six months at TMC and Dr. B. R. Ambedkar Teaching Hospital after obtaining the ethical approval from institutional ethical committee. A total of 60 patients with long-term PPI use were included in the study after taking written informed consent from them.

Inclusion Criteria

1. Male / female subjects aged 18-65 yrs.
2. On PPI therapy more than two years.
3. Ability to comply with the requirements of the protocol and be available for study visits over six months.

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4. Willing to participate in the study.

Exclusion Criteria

1. Subjects aged < 18 and >65 yrs.
2. Patients on vitamin B₁₂ and magnesium supplementation over last six months.
3. Strict vegetarian.
4. Diseases which interferes vitamin B₁₂ absorption i.e. Achlorhydria, Hypochlorhydria, Pernicious anemia, Gastrectomy, Chronic pancreatitis, Malabsorption syndrome, Small intestinal bacterial overload, Short bowel syndrome, Crohn’s disease, Celiac sprue, etc.
5. Drugs which interferes vitamin B12 and magnesium level on body i.e. Diuretic, Metformin, Potassium, Chloramphenicol, Angiotensin converting enzyme inhibitors, beta blockers, Digitalis, Gentamycin, Amphotericin B, Cisplatin etc.

Calculation of Sample Size:

$$n = 4 p q / L^2$$

Where p = Prevalence = 13% (Prevalence as per the study, “Association of Proton pump inhibitor with Hypomagnesaemia: A cross sectional study at a Tertiary care Hospital of Anand District.”²¹

$$q = (100-p) = 87 \%, L = \text{Allowable error (absolute)} = 9 \%$$

By the formula, $n = 4 p q / L^2$

Calculated sample size = 55.

Extra 10% sample added to compensate any incomplete data

So, final sample size = 60.

STATISTICAL ANALYSIS

All relevant data so collected were entered in the master chart and analyzed using IBM SPSS Statistics 20. Results obtained were based on descriptive statistics.

RESULT

Of the 60 participants, male were 30 (50%) and female 30 (50%). Age >45 years were 45 (75%) and <45 years were 15 (25%). Mean age was 50.78 years. The prevalence of participants with low serum magnesium and low serum vit B₁₂ levels were 16 (26.67%) and 4 (6.67%) respectively. The prevalence of PPI users with low serum magnesium and low serum vit B₁₂ levels in younger (<45 years) were 2 (12.5%) and 0 (0%) respectively and among older (>45 yrs) were 14 (87.5%) and 4 (100%) respectively (table-1). Mean PPI use was 5.123 years.

DISCUSSION

In 2011, Cundy T et al. reported 30 cases of severe hypomagnesaemia in patients on PPI therapy.¹⁵ In 2008,

Agarwal et al. reported a 43-year-old man, on high-dose omeprazole for reflux esophagitis for 3 years developed symptomatic hypomagnesaemia and hypocalcaemia and withdrawal of PPI therapy led to normalized level in 6 wks and symptoms in 12 wks.¹⁶ In 2008, Cundy et al. reported 2 patients with severe hypomagnesaemia and hypocalcaemic seizures, and who were on long-term PPI therapy.¹⁷ In 2006, Epstein et al. reported two patients on PPI therapy presented with tetany due to hypomagnesaemic hypoparathyroidism, and withdrawal of the PPI normalized the metabolic abnormalities.¹⁸ In 1980, Steinberg WM et al. reported the effect of cimetidine on the uptake of protein-bound cyanocobalamin, the excretion of radio-active cyanocobalamin decreased from 2.3% to 0.2% after a morning dose of cimetidine 300 mg.¹⁹ In 1994, Macuard et al. reported that treatment of healthy subjects with omeprazole 20 mg or 40 mg daily for 2 weeks resulted in decreased vitamin B₁₂ absorption as measured by a modified Schilling test. Cyanocobalamin absorption was reduced from 3.2% to 0.9% in those who received 20 mg omeprazole, and from 3.4% to 0.4% in those who received 40 mg omeprazole.²⁰

In our cross-sectional study, prolonged acid suppression due to proton pump inhibitor use was associated with significantly low S. Magnesium level among 16 patients (26.67%) and low serum vit B₁₂ level in 4 patients (6.67%). All age groups of patients using long term PPI were equally involved with low serum Mg level, suggesting that age is not a factor influencing S. Mg level in chronic PPI users (figure-1). Whereas, low S. Vit B₁₂ levels are found in older aged patients with chronic PPI use.

From our study it was found that Low serum vitamin B₁₂ was

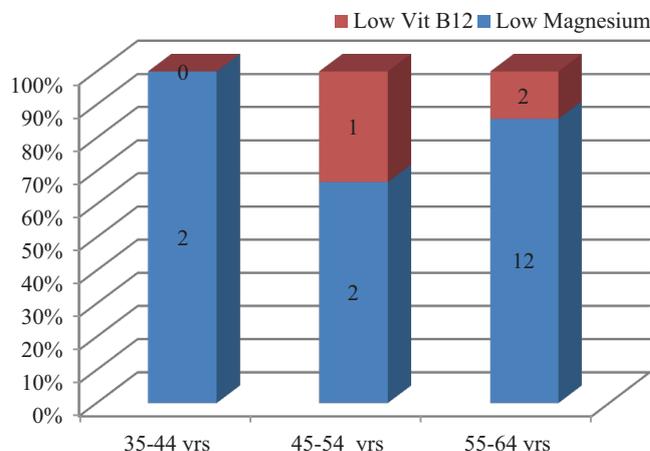


Figure-1: Age Distribution of low serum magnesium and low serum vitamin B₁₂ level

	All (n= 60)	Low magnesium(n=16)	Low vitamin B ₁₂ level(n=4)
Age in years	50.78(SD-10.14)	55.63(SD-7.182)	58.75(SD-5.50)
Male	30(50%)	8(50%)	4(100%)
Female	30(50%)	8(50%)	0
Height	1.5570(SD-0.0558)	1.56(SD-0.6)	1.57(SD-0.012)
Weight	58.75(SD-7.53)	57.62(SD-7.6)	64(SD-2.3)
BMI	24.18(SD-2.26)	23.44(SD-2.33)	25.98(SD-1.36)
Duration of PPI	5.12(SD-2.81)	5.43(SD-3.52)	10
Magnesium	1.84(SD-0.18)	1.6(SD-0.13)	1.95(SD-0.058)
Vitamin B ₁₂	436(SD-184.1)	464(SD-220.53)	207(SD-1.16)

SD - Standard Deviation. BMI - Body mass index.

Table-1: Demographic data of long term PPI users in relation with low serum magnesium and low serum vitamin b12 level.

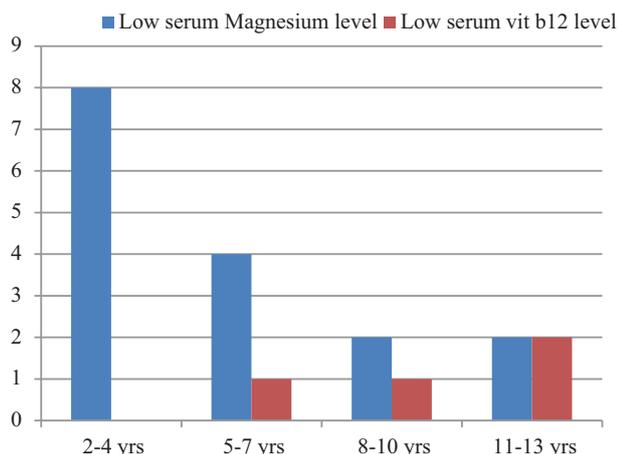


Figure-2: Duration of PPI with low serum magnesium and low serum vitamin B₁₂ level.

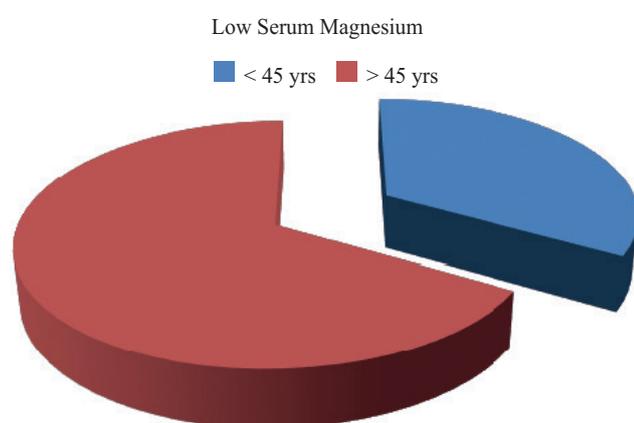


Figure-3: Low Serum Magnesium in reference to age in Chronic PPI users.

associated with PPI use of more than four years whereas, low serum magnesium level was found irrespective of age and duration (figure-2). Hence, Hypomagnesemia was common in long term PPI use and low vitamin B₁₂ was associated with more prolonged use.

Here, among 60 participants age >45 years were 45 (75%) and <45 years were 15 (25%). Hypomagnesemia was found in 2 (<45 yrs) and 14 (>45 yrs) among all long-term PPI users (figure-3).

CONCLUSION

Our cross-sectional study revealed significantly lower serum Mg level and serum Vit B₁₂ level in long term PPI users and it implies that long-term use of PPIs could be associated with subclinical Mg and vit B₁₂ insufficiency or deficiency status. Hypomagnesemia was seen irrespective of duration and age of long term PPI use, however low vit B₁₂ was found in older individuals after more prolonged use. Our study also revealed that since different types of PPIs were involved with hypomagnesemia, collectively we could conclude that it was a class effect of all types of PPIs. Future studies that include non PPI users as a control group and other prospective studies that include pre-treatment and post-treatment S. Mg and S. Vit B₁₂ levels when initiating PPI therapy will provide more direct evidence for the association of PPIs with s. Mg and s. vit B₁₂ levels and shall clarify its underlying mechanism(s) involved. Limitations of our study were: Sample size was small, duration

of study was short, and serum levels of magnesium and vit B₁₂ were not recorded prior to the study.

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A Study of Anaerobic Infections and Sensitivity Pattern in Neck Abscess at Tertiary Hospital

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ABSTRACT

Introduction: Infections caused by anaerobic bacteria are common and may be serious and life threatening, requires immediate attention and management to get best outcome. Objective of the study was to demonstrate the causative micro organisms, incidence of anaerobic organisms in neck abscess in neck abscess and to study the sensitivity pattern of the isolated micro-organisms to antimicrobial agents.

Material and methods: Descriptive analysis of 50 diagnosed patients of neck infections Based on incision and drainage for superficial neck space infections, aspiration of pus from deep neck space from October 2012 to August 2014

Results: The most common neck space infections are Ludwig's angina followed by peritonsillar abscess, incidence of aerobic growth is 64% anaerobic growth 22% and no growth 14%. Predominant aerobes are alpha hemolytic streptococcus, staph aureus and anaerobes are peptostreptococcus, porphyromonas. Aerobic organism showed sensitivity to linezolid, ciprofloxacin, clindamycin and anaerobic showed sensitivity mainly to metronidazole, clindamycin.

Conclusion: Bacteriological examination and culture of neck abscess helps to identify the causative organisms in neck abscess. It helps to isolate even the rarest of the organism and by knowing their sensitivity pattern we can direct specific therapy against them. It thus helps in a more effective treatment and fast recovery of patients

Keywords: Neck abscess, Ludwig's angina Alpha hemolytic streptococci, Peptostreptococcus, linezolid, clindamycin, metronidazole

INTRODUCTION

"Pus in the neck calls for the surgeon's best judgement, his best skill and often for all his courage"-Mosher. Deep neck space infections pose various challenges to the treating surgeon. These infections may rapidly spread in hours and can cause fatal respiratory obstruction. Various spaces may intercommunicate facilitating the spread of infection. The abscess lies deep in the neck and in close proximity to the neurovascular structures, mediastinum and skull base.¹

Infections caused by anaerobic bacteria are common and may be serious and life threatening. Anaerobes predominate in the bacterial flora of normal human skin and mucous membranes, and are a common cause of bacterial infection of endogenous origin. They predominate in deep oral and neck infections and abscess. Because of their fastidious nature they are difficult to isolate and are often overlooked. In addition to their direct pathogenicity in these infections, they possess an indirect role through their ability to produce the enzyme beta-lactamase. Thus they are capable of shielding non beta-lactamase producing bacteria from penicillins. Failure to direct therapy against these organisms often leads to clinical failures.²

Their isolation requires appropriate methods of collection, transportation and cultivation of specimens. Treatment of anaerobic bacterial infection is complicated by, slow growth of these organisms which makes diagnosis in laboratory only after several days and by growing resistance of anaerobic bacteria to antimicrobial agents. They are typically polymicrobial, more than anaerobe being responsible besides aerobic bacteria.³

While the infection is usually localised, general dissemination may occur by bacteremia. Pus produced by anaerobes is characteristically putrid, with a pervasive, nauseating odour. Pronounced cellulitis is a common feature of anaerobic wound infections. Patients at risk of neck abscess include-immunocompromised patients, HIV, chemotherapy, diabetes, malnutrition.³

In the pre-antibiotic era, tonsillitis and pharyngitis accounted for 70% of cases and often affected the lateral pharyngeal space (parapharyngeal space). Odontogenic causes-this is presently the most common cause, Salivary gland infections, URTI, Trauma, foreign body, Instrumentation, spread of infection from other areas, Previously undiagnosed congenital deformities, Pott's disease, Retropharyngeal lymphadenitis, Cervical lymphadenitis, Peritonsillar abscess/cellulitis, intravenous or subcutaneous drug abuse, Unknown causes-20% of cases. Mixed flora of aerobes and anaerobes are encountered in neck abscess. Common anaerobes include *B.melaninogenicus*, *Peptostreptococcus*, *Eikenellacorrodens* and *Fusobacterium*.

Study was aimed with the objective to demonstrate the causative micro organisms, incidence of anaerobic organisms in neck abscess in neck abscess and to study the sensitivity pattern of the isolated micro-organisms to antimicrobial agents.

MATERIAL AND METHODS

Patients presenting with neck abscess were selected from ENT Outpatient department and admitted cases in the wards in JSS Medical College and Hospital, Mysore between 1st October 2012 and 31st August, 2014. Data was collected only from the patients who gave consent for the study. Data was collected in a pretested proforma meeting the objective of the study. 50 patients were selected from purposive sampling method. The study was a prospective cohort study. Both males and female patients presenting with neck abscess were included: Cases due to tubercular origin and Age group lesser than 2 years and more

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than 60 years are excluded

Method of collection of data (including sampling procedures):

For superficial neck space infections-incision and drainage is performed and pus is collected for culture and sensitivity in anaerobic culture test tubes (having thioglycollate medium). For deep neck space infections-using syringe pus is collected and then sent for culture and sensitivity. Culture medium for aerobic and anaerobic bacteria is Mac Conkey medium (Figure-2) and blood agar (Figure-1)

STATISTICAL ANALYSIS

Contingency co-efficient analysis, Chi square test and descriptive statistics were used to infer results using SPSS for windows (version 20).

RESULTS

The subjects comprised a total of 50 patients presenting with neck abscess who came to the ENT OPD or where admitted to the ENT ward. Out of 50 patients there were 33 males and 17 females in the age group of 2 to 60 years.

Aerobic growth was found in 32 cases, anaerobic growth in 11 cases and no growth in 7 cases.

Out of 50 subjects, 11 cases were ludwigs angina, 10 were peritonsillar abscess, 8 were submandibular abscess, 7 were diffuse neck abscess, 5 were parotid abscess, 4 were parapharyngeal abscess, 2 cases each of retropharyngeal abscess and submental abscess and 1 case of posterior triangle abscess. (Table-1)

There is a strong association between Ludwigs angina and odontogenic cause as 10 out of 11 (Graph-2) cases of Ludwigs angina are odontogenic in origin. All the cases improved after

dental extraction. Diabetes mellitus is an important predisposing factors in all the cases of neck abscess.

Out of a total of 11 cases of Ludwigs angina (Graph-3), aerobes were present in 8 cases and anaerobes in 3 cases. The most common aerobic organism isolated in Ludwigs angina is *Staphylococcus aureus* and Coagulase negative *Staphylococcus aureus* accounting for 18.2% each followed by *Non Haemolytic Streptococci*, *Alphahaemolytic Streptococci*, *Escherichia coli* and *Enterobacter cloacae* each accounting for 9.1%. No aerobic growth was observed in 27.3% cases. The most common anaerobic organism observed in *Ludwigs angina* is *Peptococcus*, *Porphyromonas* and *Eubacterium* each of 9.1% and no anaerobic growth was observed in 72.7%.

Out of 10 cases of Peritonsillar abscess, aerobic growth was observed in 6 cases, anaerobic growth was observed in 2 cases and no growth was observed in 2 cases.

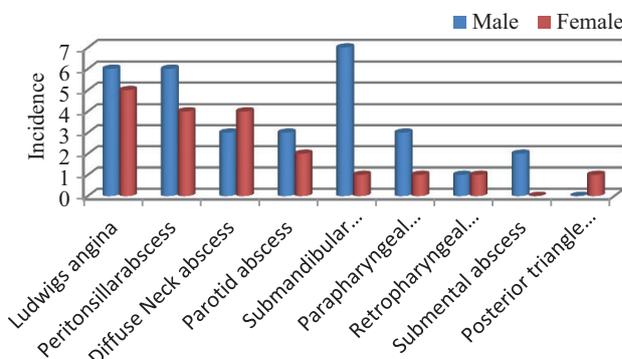
The most common aerobic organism isolated in Peritonsillar

Diag	Sex		Total
	M	F	
Ludwigs angina	6	5	11
Peritonsillar abscess	6	4	10
Diffuse Neck abscess	3	4	7
Parotid abscess	3	2	5
Submandibular abscess	7	1	8
Parapharyngeal abscess	3	1	4
Retropharyngeal abscess	1	1	2
Submental abscess	2	0	2
Posterior triangle abscess	0	1	1
Total	31	19	50

Table-1: Incidence of neck abscess



Figure-1: Blood agar *S pyogenes* showing beta hemolysis; **Figure-2:** Mac Conkey Medium



Graph-1: incidence of neck abscess

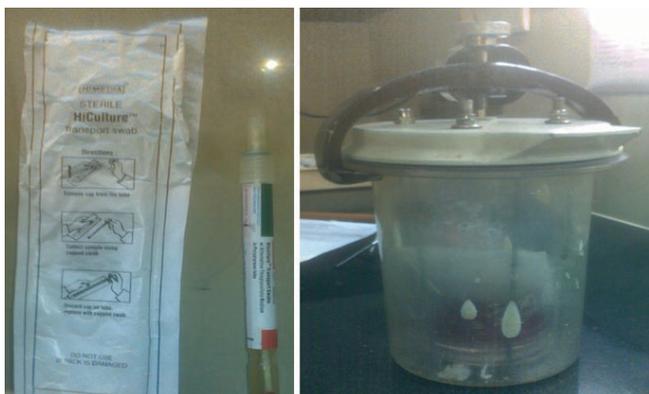
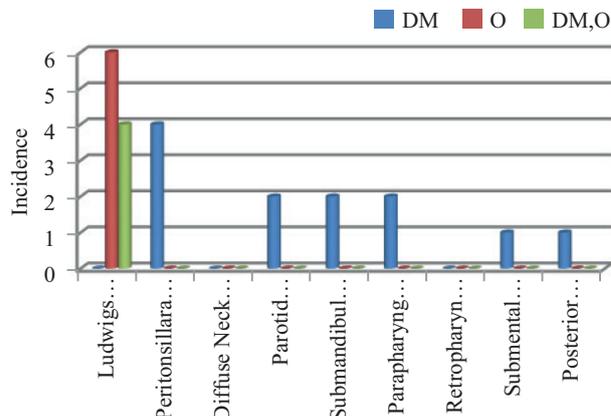


Figure-3: Sterile swab for collection; **Figure-4:** Anaerobic jar



Graph-2: incidence of neck abscess in DM and dental pathology

abscess (Graph-4) is *Alpha haemolytic Streptococci* accounting for 30% of cases, followed by *Non haemolytic Streptococci*, *Klebsiella* and *Niesseria* each accounting for 10% of cases. No aerobic growth was observed in 40% of cases.

The most common anaerobic organism isolated in peritonsillar abscess is *Peptostreptococcus* and a combination of *Peptostreptococcus* and *Bacteroides* each mounting to 10%. No anaerobic growth was observed in 80% of cases

From Diffuse neck abscess (Graph-5) only aerobes were isolated. A total of 7 aerobes were isolated. No anaerobes were present. Among the aerobes, *Staphylococcus aureus* was present in 42.9% of cases. Coagulase negative *Staphylococcus aureus* was responsible for 28.6% of infections. *Actinobacter boumani* and *Klebsiella* was isolated in 14.3% of infections.

Out of a total of 5 cases of parotid abscess (Graph-6), aerobes were isolated in 1 case and anaerobes were present in 2 cases. No growth was observed in 3 cases.

The aerobe isolated was *Alpha Haemolytic Streptococci* responsible for 20% of aerobic growth, no aerobic growth was observed in 80% of cases. Among the anaerobes, *Peptostreptococcus* was isolated in 20% of cases and *Porphyromonas* was isolated in another 20% of cases. No anaerobic growth was observed in 60% of infections.

Out of 8 cases of Submandibular abscess, 5 were aerobes and 3 were anaerobes. Out of aerobic growth, 25% were *Coagulase negative Staphylococcus aureus*, *Alpha haemolytic Streptococci*, *Staphylococcus aureus* and *Klebsiella* were present in 12.5% of cases each and no aerobic growth was observed in 37.5% of cases.

Out of anaerobes, *Peptostreptococcus* was present in 25% of cases, *Peptococcus* with *Propionibacterium* was present in 12.5%, no anaerobic growth was observed in 62.5%

Out of 4 cases of Parapharyngeal abscess (Graph-7), 2 were aerobes, 1 was anaerobe and no growth was obtained in 1 case. Among aerobes, *Nonhaemolytic Streptococci* was isolated in 25% of cases, *Klebsiella pneumoniae* was isolated in 25% of cases, no growth was obtained in 50% cases. Among anaerobes, *Eubacterium* with *Peptostreptococcus* was present in 25% cases and no anaerobic growth was observed in 75% cases

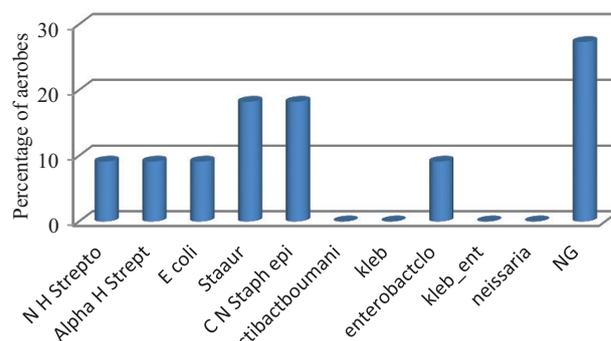
Out of 2 cases of Retropharyngeal abscess, aerobes was present in 1 case and no growth obtained in 1 case. Among aerobes, *Klebsiella pneumoniae* was observed in 50% of cases and no aerobic growth was observed in the other 50% of cases. Anaerobes was absent in 100% of cases.

Of the 2 cases of Submental abscess, aerobes were present in 2 cases. There was no anaerobic growth. Among aerobes, *Non-haemolytic Streptococci* was present in 50% of cases and *Klesiella* with *Enterobacter cloacae* was present in another 50% of cases.

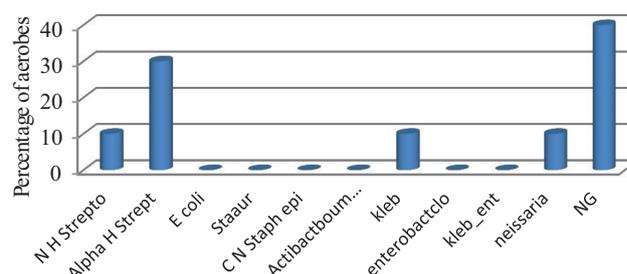
There was only 1 case of posterior triangle abscess and no growth was observed both for aerobic and anaerobic organisms. Penicillin showed a sensitivity of 100% sensitivity to *Escherichia coli*, *Klebsiella* with *Enterobacter cloacae*, to *Neisseria* and showed resistance to all other organisms. Oxacillin showed a sensitivity of 16.7% to *Staphylococcus aureus* and a sensitivity of 33.3% to Coagulase negative *Staphylococcus aureus* and showed resistance to all other organisms. P value is 0.000, thus it was statistically significant.

Erythromycin showed a sensitivity of 75% to *Non Haemolytic*

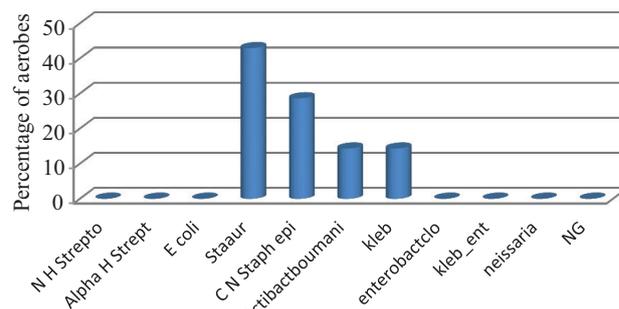
Streptococci, 50% sensitivity to *Alpha Haemolytic Sterptococci*, 100% sensitivity to *Escherichia Coli*, sensitivity of 16.7% to *Staphylococcus aureus*, sensitivity of 50% to Coagulase



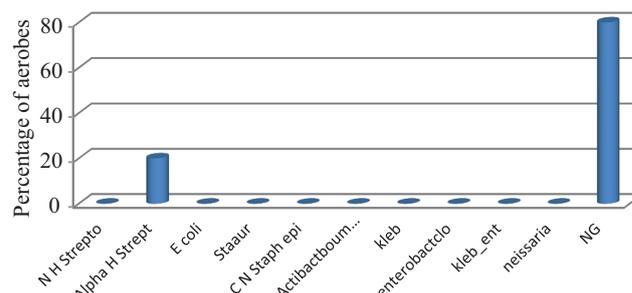
Graph-3: incidence of aerobes in ludwings angina



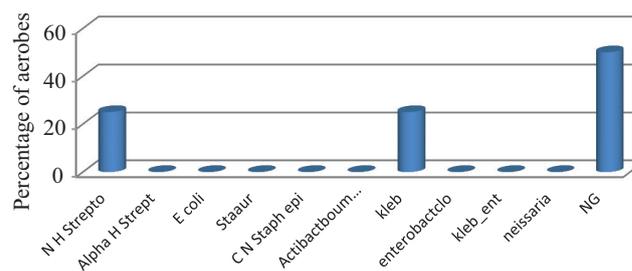
Graph-4: incidence of aerobic organism in peritonsillar abscess



Graph-5: Incidence of aerobes in diffuse neck abscess



Graph-6: Incidence of pathogen in parotid abscess



Graph-7: Incidence of aerobes in parapharyngeal abscess

negative *Staphylococcus aureus* and showed resistance to other organisms.

Linezolid showed a sensitivity of 100% to *Non Haemolytic Streptococci*, a sensitivity of 100% to *Alpha Haemolytic Streptococci*, sensitivity of 100% to *Escherichia Coli*, sensitivity of 83.3% to *Staphylococcus aureus*, a sensitivity of 100% to Coagulase negative *Staphylococcus aureus* and showed resistance to other aerobic organisms. P value is 0.000, thus it is statistically significant.

Ciprofloxacin (Graph-8) showed a sensitivity of 25% to *Non Haemolytic Streptococci*, a sensitivity of 16.7% to *Alpha Haemolytic Streptococci*, a sensitivity of 100% to *Escherichia Coli*, a sensitivity of 16.7% to *Staphylococcus aureus*, a sensitivity of 50% to Coagulase negative *Staphylococcus aureus*, a sensitivity of 80% to *Klebsiella pneumoniae* and showed resistance to other aerobic organisms.

Gentamycin showed a sensitivity of 75% to *Non haemolytic Streptococci*, a sensitivity of 66.7% to *Alpha haemolytic Streptococci*, 100% sensitivity to *Escherichia coli*, 50% sensitivity to *Staphylococcus aureus*, 66.7% sensitivity to Coagulase negative *Staphylococcus aureus*, 80% sensitivity to *Klebsiella pneumoniae*, 100% sensitivity to *Klebsiella* with *Enterobacter*.

It showed resistance to other aerobic organisms. P value is 0.013, thus it is statistically significant.

Cephalosporins (Graph-9) showed a sensitivity of 75% to *Non haemolytic Streptococci*, 100% sensitivity to *Escherichia coli*, a sensitivity of 16.7% to *Staphylococcus aureus*, a sensitivity of 33.3% to Coagulase negative *Staphylococcus aureus*, a sensitivity of 40% to *Klebsiella pneumoniae*, sensitivity of 100% to *Klebsiella* with *Enterobacter cloacae*.

Levofloxacin showed a sensitivity of 50% to Coagulase negative *Staphylococcus aureus* and a sensitivity of 100% to *Klebsiella* with *Enterobacter cloacae*. P value is 0.001, thus it is statistically significant

All the aerobic organisms showed zero percent sensitivity to Metronidazole and to Kanamycin. Clindamycin showed a sensitivity of 50% to *Non haemolytic Streptococci*, a sensitivity of 66.7% to *Alpha haemolytic Streptococci*, a sensitivity of 50% to *Staphylococcus aureus*, a sensitivity of 100% to Coagulase negative *Staphylococcus aureus*.

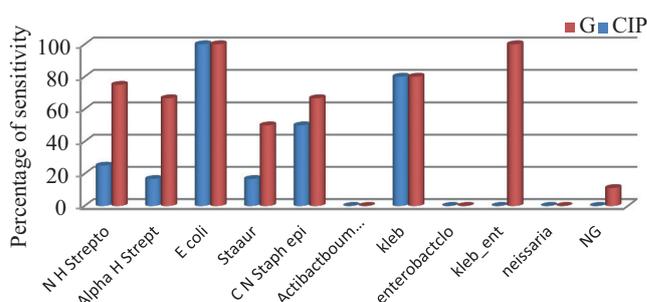
It showed resistance to other organisms. Colistin showed a sensitivity of 100% to *Escherichia coli*, a sensitivity of 100% to *Actinobacter boumani*, a sensitivity of 20% to *Klebsiella pneumoniae*, a sensitivity of 100% to *Enterobacter cloacae* and *Klebsiella pneumoniae*. It showed resistance to other organisms.

Vancomycin showed a sensitivity of 25% to *Nonhaemolytic Streptococci*, a sensitivity of 50% to *Staphylococcus aureus*, a sensitivity of 83.3% to Coagulase negative *Staphylococcus aureus*.

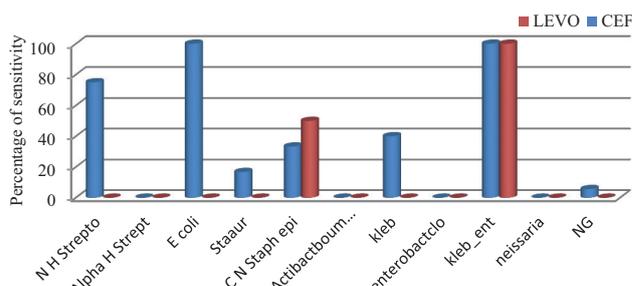
It showed resistance to other organisms. P value is 0.048, thus it is statistically significant.

Imipenam showed a sensitivity of 25% to *Nonhaemolytic Streptococci*, 100% sensitivity to *Escherichia coli*, 100% sensitivity to *Klebsiella pneumoniae*, 100% sensitivity to *Enterobacter cloacae* and 100 sensitivity to *Klebsiella* with *Enterobacter cloacae*. It showed resistance to other organisms.

Piperacillin showed a sensitivity of 100% to *Escherichia coli* and a sensitivity of 60% to *Klebsiellapneumoniae*.



Graph-8: sensitivity pattern of various bacteria to ciprofloxacin and gentamycin



Graph-9: sensitivity pattern of aerobic organisms.

It showed resistance to all other organisms. P value is 0.000, thus it is statistically significant.

Clindamycin showed a sensitivity of 100% to *Peptostreptococcus*, a 100 sensitivity to *Peptostreptococcus* with *Bacteroides*, 100% sensitivity to *Eubacterium* with *Peptostreptococcus*, 100% sensitivity to *Peptococcus*, 100% sensitivity to *Porphyromonas*, 100% sensitivity to *Eubacterium* and 100% sensitivity to *Peptococcus* with *Propionobacterium*. Metronidazole showed a sensitivity of 100% to *Peptostreptococcus* with *Bacteroides* and a 100% sensitivity to *Eubacterium*. Kanamycin also showed a sensitivity of 100% to *Peptostreptococcus* with *Bacteroides* and a 100% sensitivity to *Eubacterium*. P value is 0.000 thus it is statistically significant. Colistin showed a sensitivity of 100% to *Eubacterium* with *Peptostreptococcus* and showed a sensitivity of 100% to *Eubacterium*.

Vancomycin showed a sensitivity of 75% to *Peptostreptococcus*, a sensitivity of 100% to *Peptostreptococcus* with *Bacteroides*, a sensitivity of 100% to *Eubacterium* with *Peptostreptococcus*, a sensitivity of 100% to *Peptococcus*, a sensitivity of 100% to *Porphyromonas*, a sensitivity of 100% to *Eubacterium* and a sensitivity of 100% to *Peptococcus* with *Propionobacterium*.

DISCUSSION

The present study was conducted at JSS Medical College and Hospital, Mysore from 1st October 2012 to 31st August 2014. The aim of our study was to identify the causative micro-organisms in neck abscess, to study the incidence of anaerobic organisms in neck abscess and to study the sensitivity pattern of the isolated micro-organism to antimicrobial agents.

In our study among 50 cases, the most common neck space abscess is Ludwig's angina (22%), Peritonsillar abscess (20%), Submandibular space abscess (16%) followed by Diffuse neck abscess (14%), Parotid abscess (10%), Parapharyngeal abscess (8%), Retropharyngeal abscess (4%), Submental abscess (4%) and Posterior triangle abscess (2%). These results were similar to the study conducted by Larawin V, Najpao J, Debey SP in

which Ludwig's angina was the most common cause of neck abscess.⁴

These results are also similar to the results obtained by Beasley DJ, Amede RG in which odontogenic infections with involvement of the submandibular space are the most common source of deep neck space infections in adults, whereas in the pediatric population the most common cause is acute tonsillitis with involvement of the peritonsillar space.⁵

Of the 50 cases, aerobes are isolated in 32 cases, anaerobes in 11 cases and no growth is observed in 7 cases. Thus the incidence of aerobic growth is 64%. The incidence of anaerobic growth is 22% and the incidence of no growth is 14%. These results were similar to the results obtained by Antony J Rega, Shahid R Aziz, Ziccardi VB that showed aerobes were present in 65.7% and anaerobes were present in 34.3%.⁶

The predominant aerobes isolated are *Alpha haemolytic Streptococci (Viridans Streptococci)* (12%), *Staphylococcus aureus* (12%) and *Coagulase negative Staphylococcus aureus* (12%) followed by *Klebsiella pneumoniae* (10%) and *Non Haemolytic Streptococci* (8%). These results were similar to the results obtained by Shih-Wei-Yang, Ming-Hsun Lee, Lai-Chu See et al which showed that the predominant aerobes were *Viridans streptococci*, *Klebsiella pneumoniae*, and *Staphylococcus aureus*. The predominant anaerobes included species of *Prevotella*, *Peptostreptococcus*, and *Bacteroides*.⁷

The predominant anaerobes isolated are *Peptostreptococcus* (8%), *Porphyromonas* (4%), *Peptococcus* (2%), *Eubacterium* (2%), *Peptostreptococcus with Bacteroides* (2%), *Eubacterium with Peptostreptococcus* (2%) and *Peptococcus with Propionibacterium* (2%). These results were similar to the results obtained by Tabaqchali S that showed that the predominant anaerobic organisms obtained in head and neck infections were *Bacteroides species*, *Peptococcus*, *Peptostreptococcus*, *Propionibacterium species*.⁸

In Ludwig's angina the most common organism isolated is *Staphylococcus aureus* and *Coagulase negative Staphylococcus aureus* each 18.2% followed by *Non haemolytic Streptococci*, *Alpha haemolytic Streptococci*, *Escherichia coli*, *Enterobacter cloacae* each 9.1% and the anaerobes *Peptococcus*, *Porphyromonas* and *Eubacterium* each 9.1%. Odontogenic infection is the most common predisposing factor. These results are similar to that obtained by Parhiscar A, Har-EIG in which *Streptococcus viridans*, *Staphylococcus epidermidis* and *Staphylococcus aureus* are the leading pathogens in Ludwig's angina. Dental infections are the leading etiology.⁹

In Peritonsillar abscess the most common organism isolated is *Alpha haemolytic Streptococci* accounting to 30%. *Non haemolytic streptococci*, *Klebsiella pneumoniae* and *Neisseria* were present in 10% of cases each. The anaerobes *Peptostreptococcus* and *Peptostreptococcus with Bacteroides* were present in 10% of cases. These results are similar to that obtained by Brook which showed *Streptococci* to be the most common aerobic organism and *Peptostreptococcus* to be the most common anaerobic organism isolated in Peritonsillar abscess.¹⁰

In Diffuse neck abscess, only aerobes are isolated the most common being *Staphylococcus aureus* responsible for 42.9% of cases followed by *Coagulase negative Staphylococcus aureus* present in 28.6% of the cases. *Actinobacter boumani* and

Klebsiella were isolated in 14.3% of the cases. No anaerobes were isolated. In Parotid abscess, *Alpha haemolytic Streptococci* is present in 20% of the cases. The anaerobes *Peptostreptococcus* and *Porphyromonas* are also present in 20% of the cases. Thus aerobes and anaerobes were isolated in equal number of cases.

In Submandibular abscess, the most common organism isolated is *Coagulase negative Staphylococcus aureus* present in 25% of the cases and the anaerobe *Peptostreptococcus* also present in 25% of the cases. *Alpha haemolytic Streptococci*, *Staphylococcus aureus*, *Klebsiella* are present in 12.5% of the cases and *Peptococcus with Propionibacterium* is present in 12.5% of the cases. Thus aerobes and anaerobes are equally represented. These results are similar to the study done by Anthony J Rega, Shahid R Aziz et al which showed *Peptostreptococcus* and *Alpha haemolytic Streptococci* were the predominant organisms in Submandibular abscess.⁶

In Parapharyngeal abscess, *Non haemolytic Streptococci* and *Klebsiella pneumoniae* are isolated in 25% of cases and the anaerobes *Eubacterium with Peptostreptococcus* is also isolated in 25% of the cases. These results are consistent with that obtained by Lee YQ, Kanagalingam J et al that showed *Klebsiella pneumoniae* to be the most common organism isolated in Parapharyngeal abscess.¹¹

Retropharyngeal abscess showed only the growth of *Klebsiella pneumoniae* in 50% of the cases and no anaerobic growth. Submental abscess showed growth of *Non haemolytic Streptococci* in 50% of cases and *Klebsiella with Enterobacter* in another 50% of cases. There was no anaerobic growth. Posterior triangle abscess did not show any growth.

Penicillin was found to be resistant to most micro-organisms showing sensitivity only to *Escherichia coli*, to *Klebsiella with Enterobacter cloacae* and to *Neisseria*. This is due to the emergence of beta-lactamase producing strains which are rendering Penicillins ineffective in treatment. Oxacillin showed a sensitivity of 33.3% to *Coagulase negative Staphylococcus aureus* and a sensitivity of 16.7% to *Staphylococcus aureus*. It was resistant to all other organisms. MRSA (*Methicillin Resistant Staphylococcus Aureus*) have become common –resistant not only to penicillin but to all other beta lactam antibiotics and many other antibiotics. These results were similar to the study conducted by Kuriyama T, Karasawa T, Nakagawa et al which showed the emergence of beta-lactamase producing strains of penicillins especially to strains of *Bacteroides* rendering the penicillins ineffective for treatment.¹²

Our study showed Linezolid, Erythromycin, Ciprofloxacin, Gentamycin and Cephalosporins sensitive to most aerobes and Metronidazole and Clindamycin effective against anaerobes. This was similar to the study conducted by Bahl R, Gupta M, Kanawardeep et al which showed that aerobic organisms were 60% effective to Erythromycin, 25% to Cephalosporins, 70% to Ciprofloxacin, 15% to Gentamycin. Only 10% were sensitive to Ampicillin. Sensitivity of anaerobic strains to Metronidazole and Clindamycin was 85% each. Metronidazole has been used as an empirical antibiotic for anaerobic cover.¹³

Vancomycin showed 25% sensitivity to *Non haemolytic Streptococci*, 50% sensitivity to *Staphylococcus aureus*, 83.3% sensitivity to *Coagulase negative Staphylococcus aureus*. It the drug of choice for *Methicillin resistant Staphylococcus aureus* (MRSA) and can be given in all life threatening Staphylococcal

infections.¹⁴

Our study showed sensitivity of all anaerobes to Clindamycin and 50% sensitivity to Metronidazole similar to the study conducted by Sutter VL, Fingegold SM which proved Clindamycin and Metronidazole to be effective against all anaerobes.¹⁵

In our study the incidence of aerobic growth is 64%, incidence of anaerobic growth is 22% and the incidence of no growth is 14%. Ludwig's angina is the leading cause of neck abscess followed by Peritonsillar abscess and Submandibular space abscess. The most common aetiology for Ludwig's angina is odontogenic. Diabetes mellitus is an important factor associated with neck abscess. The predominant aerobes isolated in neck abscess are – *Alpha haemolytic Streptococci*, *Staphylococcus aureus*, *Coagulase negative Staphylococcus aureus*, *Non haemolytic Streptococci* and *Klebsiella pneumoniae*. The predominant anaerobes isolated in Neck abscess are *Peptostreptococcus*, *Porphyromonas*, *Eubacterium*, *Peptococcus*, *Peptostreptococcus* with *Bacteroides*, *Eubacterium* with *Peptostreptococcus*, *Peptococcus* with *Propionibacterium*. Most of the aerobes were found to be resistant to Penicillin due to the emergence of beta-lactamase producing strains. Oxacillin was found to be effective in Methicillin sensitive *Staphylococcus aureus* and resistant to all other organisms. Vancomycin is the drug of choice for Methicillin resistant *Staphylococcus aureus* and can be given in all life threatening Staphylococcal infections. Linezolid, Ciprofloxacin, Clindamycin, Erythromycin, Cephalosporins and Gentamycin were found to be effective against most aerobic organisms. But the use of Gentamycin has to be limited only in selective cases owing to its nephrotoxic and vestibulotoxic effects.

CONCLUSION

To conclude antimicrobial sensitivity for all the head and neck infections is a must and has to be done for all the neck abscess cases. It will help in directing a more effective treatment against the respective causative organisms and will help in achieving a faster cure rate. It will help us to detect even the rare causative organisms and by knowing their sensitivity pattern we can direct an effective treatment against them. It will also help in preventing the dreaded complications of the neck abscess by treating the infection at an earlier stage and preventing its further spread.

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A Survey of Attitudes and Knowledge of Nigerian Orthopaedic Surgeons and Traumatologists Regarding Regional Anaesthesia

Amaefula ET¹, Nwagwu J¹, Owoeye OG²

ABSTRACT

Introduction: Regional anaesthesia (RA) is emerging as a preferred choice of anaesthesia in orthopaedics and trauma surgery because of the perceived cost effectiveness and safety. However the knowledge and attitudes of Orthopaedic Surgeons and Traumatologists regarding RA vary in different parts of the world. In order to determine the level of awareness, we conducted a survey of attitudes to, and knowledge of Nigerian Orthopaedic Surgeons and Traumatologists to regional anaesthesia

Material and Methods: We conducted a cross sectional questionnaire based study during the Annual General Meeting of the Nigerian Orthopaedic Association in Yenagoa, Bayelsa State Nigeria in in December 2011. Knowledge and attitude to regional anaesthesia were accessed using pretested questionnaire and the data collected were represented in percentages.

Results: Out of the 63 participants studied, 55 (87.3%) were employed in government hospitals, while 8 (12.7%) were in private practice. Knowledge and skills of regional anaesthesia were acquired during residency training and clinical practice by 79%. The preference for regional anaesthesia was mainly because it is perceived to be safe (96.8%,) associated with reduced medical complication (90.5%), and is cost effective (88.9%). It was however not favoured because of delays during induction of anaesthesia (60.3%) and assessment of neurological complications (63.5%)

Conclusion: Regional anaesthesia remains a preferred method of anaesthesia by Orthopaedic Surgeons and Traumatologists on account of safety and cost-effectiveness, however the benefits is attenuated by the perception that complimentary general anaesthesia, is often required and that the complex techniques of RA creates delays in induction.

Keywords: Attitudes, Knowledge, Orthopaedic surgeons, Regional anaesthesia, Traumatologists,

surgery under regional anaesthesia.² The immense benefit of regional anaesthesia in the postoperative period has created greater awareness not only in the surgical community but also in the general public life.³

The next wave in regional analgesia for ambulatory orthopaedic patients may be the placement of peripheral nerve catheters. In the US, there are more orthopaedic procedures done as day surgery than in-patients because of peripheral nerve blocks.⁴

A regional technique continued into the post-operative period potentially offers attenuation of surgical stress, superior postoperative analgesia, reduction in postoperative nausea and vomiting, and earlier mobilization in patients undergoing extensive surgeries. Regional analgesia forms an important component of multimodal analgesia in acute pain management. Patient's satisfaction, a growing demand for cost-effective anaesthesia and analgesia, and a favourable post-operative recovery profile has resulted in a growing interest in regional anaesthesia. Orthopaedic surgery particularly lends itself to the use of regional anaesthesia.

There is paucity of work on orthopaedic surgeons' perception of regional anaesthesia in Nigeria we therefore carried out a study to see if the Nigerian Orthopaedic Surgeons understand and appreciate the importance of regional anaesthesia in carrying out surgical and manipulative procedures.

MATERIAL AND METHODS

This was a questionnaire based cross sectional study in which 100 respondents were selected from 350 Orthopaedic Surgeons using systematic sampling technique. The questionnaire (appendix 1) consists of section A which has questions on location, type of practice and subspecialty while sections B and C were on determinants of attitudes and knowledge respectively. One hundred pretested questionnaires were administered to these Orthopaedic Surgeons during the December 2011 Annual General Meeting of the Nigerian Orthopaedic Association that held in Yenagoa, Bayelsa State Nigeria.

STATISTICAL ANALYSIS

The returned questionnaires were then analyzed using Chi-

INTRODUCTION

RA is anaesthesia that affects a large part of the body, such as a limb or the lower half of the body and the techniques can be divided into central and peripheral techniques. The central techniques include neuraxial blocks (epidural anaesthesia, spinal anaesthesia). The peripheral techniques can be further divided into plexus blocks such as brachial plexus blocks, and single nerve blocks¹ RA has long been known to be of benefit to major orthopaedic surgical patients.² Perhaps the greatest benefit of regional anaesthesia and analgesia is its role in providing adequate pain control for rehabilitation.

Pain control remains the key to postoperative recovery of orthopaedic surgical patients and therefore optimizing postoperative analgesia improves the patient's ability to fully participate in rehabilitative sessions.

Evidence exists of reduced postsurgical morbidity (reduced blood loss, decreased thromboembolism) with hip replacement and more rapid recovery and rehabilitation after major knee

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	Frequency	Percent
Type of practice		
Government	55	87.3
Private	8	12.7
Total	63	100.0
Orthopaedic sub-specialties		
Arthroplasty	7	11.1
Arthroscopy	1	1.6
General	42	66.7
Limb reconstruction	4	6.3
Oncology	2	3.2
Paediatrics	3	4.8
Spine	3	4.8
Trauma	1	1.6
Total	63	100.0

Table-1: Type of Practice and Specialty distribution of practitioners

square test with the help of Statistical Package for Social Sciences (SPSS) for windows version 20.

RESULTS

Sixty-three (63) of the one hundred participants in the study returned their questionnaires (63% return rate). Eleven of the respondents (17.5%) worked in Abuja the Federal Capital City; six (9.5%) each worked in Enugu and Port Harcourt, while four (6.3%) and three (4.8%) worked in Kano and Lagos respectively. The Government hospitals remain the largest employer of Orthopaedic Surgeons, accounting for 87.3 %. Most practitioners (87.3%) were general orthopaedic practitioners (Table-1), while the sub specialty of Arthroplasty accounted for (7%). Only one practitioner was strictly a trauma specialist. The predominant reasons for choice of RA were safety (96.8%, Chi-square $x^2=110.51$), reduced medical complications (90.5%, Chi-square $x^2=139.43$), cost effectiveness (88.9%, Chi-square $x^2=76.22$) and decreased post-operative sedation/

Reasons	Attitude	Frequency	Percent	Chi-Square (P-Value)
Decrease Post-operative Pain	Agree	52	82.5	105.86 (0.001)*
	Uncertain	1	1.6	
	Disagree	10	15.9	
	Total	63	100.0	
Safety	Agree	61	96.8	110.51 (0.001)*
	Disagree	2	3.2	
	Total	63	100.0	
Decrease PONV**	Agree	38	60.3	31.29 (0.001)*
	Uncertain	14	22.2	
	Disagree	11	17.5	
	Total	63	100.0	
Decreased sedation/confusion	Agree	54	85.7	117.57 (0.001)*
	Uncertain	7	11.1	
	Disagree	2	3.2	
	Total	63	100	
Decrease nausea/vomiting	Agree	56	88.9	132.14 (0.001)*
	Uncertain	1	1.6	
	Disagree	6	9.5	
	Total	63	100.0	
Decrease thrombosis risk	Agree	36	67.2	52.18 (0.001)*
	Uncertain	3	4.8	
	Disagree	24	38.1	
	Total	63	100.0	
Decrease medical complication	Agree	57	90.5	139.43 (0.001)*
	Uncertain	1	1.6	
	Disagree	5	7.9	
	Total	63	100.0	
Cost effectiveness	Agree	56	88.9	76.22 (0.001)*
	Disagree	7	11.1	
	Total	63	100.0	
Increased patient satisfaction	Agree	49	77.8	86.29 (0.001)*
	Uncertain	3	4.8	
	Disagree	11	17.5	
	Total	63	100.0	
Decreased blood loss	Agree	33	52.4	39.57 (0.001)*
	Uncertain	2	3.2	
	Disagree	28	44.4	
	Total	63	100.0	

*significant ($p < 0.05$), **PONV-Post operative nerve block

Table-2: Reasons regional anaesthesia is favoured

Reasons	Attitude	Frequency	Percentage	Chi-Square (P-Value)
Induction delays surgery	Agree	38	60.3	5.37 (0.021)*
	Disagree	25	39.7	
	Total	63	100.0	
Unpredictable success	Agree	39	61.9	52.00 (0.001)*
	Uncertain	1	1.6	
	disagree	23	36.5	
	Total	63	100.0	
Decreased patient anxiety	Agree	19	30.2	29.54 (0.001)*
	Uncertain	5	7.9	
	Disagree	39	51.9	
	Total	63	100.0	
More Side effects/complication	Agree	25	39.7	33.86 (0.001)*
	Uncertain	4	6.3	
	Disagree	34	53.9	
	Total	63	100.0	
Additional General anaesthesia is often needed	Agree	30	47.6	38.71 (0.001)*
	Uncertain	2	3.2	
	Disagree	31	49.2	
	Total	63	100.0	
Delayed assessment of neurological complication	Agree	40	63.5	46.71 (0.001)*
	Uncertain	4	6.3	
	Disagree	19	30.2	
	Total	63	100.0	
Less effective than General anaesthesia	Agree	14	22.2	84.14 (0.001)*
	Uncertain	1	1.6	
	Disagree	48	76.2	
	Total	63	100.0	

*significant ($p < 0.05$)

Table-3: Reasons regional anaesthesia is not favoured

S no	How skill was acquired	Frequency	Percentage
1	Postgraduate training	29	46.0
2	Clinical work	21	33.3
3	Anaesthetic colleague	5	7.9
4	Undergraduate	4	6.3
5	Journals	2	3.2
6	Seminars	1	1.6
7	Others	1	1.6
	Total	63	100.0

Table-4: Knowledge of regional anaesthesia

confusion (85.7% %, Chi-square $\chi^2=117.57$). Other reasons for preference of RA by respondents include increased patient satisfaction (77.8% %, Chi-square $\chi^2= 86.29$), reduced risk of thromboembolism (67.2%, Chi-square $\chi^2=52.18$) and post-operative nausea and vomiting (60.3% Chi-square $\chi^2=31.29$). These observed differences in attitudes when statistically tested were significant at p-value 0.001 (Table-2). The reason for none preference were delayed assessment of neurological complications post operatively (63.5% Chi-square $\chi^2=46.71$), unpredictable success, (61.9% Chi-square $\chi^2=52.00$), and late commencement of surgery due to delays in induction of regional anaesthesia (60.3% Chi-square $\chi^2=5.37$). At Chi-square $\chi^2=84.14$ ($p=0.001$), 76.2% of respondents disagreed that regional anaesthesia was less effective than general anaesthesia, while 53.9 % (Chi-square $\chi^2=33.86$, p- value= 0.001) disagreed that RA had more side effects. (Table-3). Table 4 shows the source of acquisition of knowledge. Seventy nine (79%) of respondents

acquired knowledge and skills of regional anaesthesia during their residency fellowships and clinical training.

DISCUSSION

Abuja, the Nigerian federal capital had the largest population of respondents 11 (17.5%) when compared to other cities. This is similar to observations made by Adebayo and Oladeji, that professional and medical personnel are disproportionately distributed to teaching hospitals in Nigeria.⁵ The idea of subspecialization in orthopaedics and traumatology is evolving, though slowly. As seen on table (Table-1), 42 (66.7%) are general Orthopaedics and Traumatology practitioners. This is in agreement with Wahab Yunusa’s observation in 2008 that the country was yet to begin a meaningful subspecialty programme⁶, and it appears that young consultants have taken heed to the call to get into short fellowship programmes in Arthroplasty, Spine, Oncology and Deformity Correction. Of all the subspecialties, arthroplasty has made significant progress with seven (11.1%) of the respondents being specialists in the field⁶

A large proportion of Nigerian Orthopaedic Surgeons 29 (46%) became aware of and acquired skills in regional anaesthesia during their postgraduate training because the Post Graduate colleges requirement for eligibility for the Part One Fellowship examination include a three-month elective training in anaesthesia,⁷ though Orthopaedic residents in both Postgraduate training colleges rate their practical exposure in anaesthesia as inadequate.⁸⁻¹¹ Twenty-one (33.3%) respondents acquired proficiency through the course of their clinical practice. The observation that only five respondents (7.9%) acquired

skills from their anaesthetic colleagues is in keeping with the finding that formalization and standardization are not common in operating room teamwork due to medicine's strongly held value of professional autonomy and craftsman mindset. These factors promote individualism as opposed to cooperation and can act as barrier to interpersonal communication and skills acquisition.¹² Pain relief after surgery continues to be a major medical challenge and 82% of respondents agree that RA provide reduction in pain post-operatively. This is in agreement with findings of Yunus et al¹³ who stated that residual effects of regional anaesthetic agents overlap long into the postoperative period of the patient, and therefore the need for postoperative analgesia will no longer be necessary. More over unrelieved postoperative pain may delay discharge and recovery resulting in inability of the patient to participate in rehabilitation programmes leading to poor outcomes.¹⁴

Sixty-one respondents (96.8%) agreed that the techniques of regional anaesthesia provided them with a safe form of anaesthesia for performing surgery, even though ultrasound guided regional anaesthesia has been found to be safer¹⁵ than peripheral nerve stimulation (PNS) that is currently used by most Nigerian anaesthesiologists for nerve localization.¹⁶ Medical complications of regional anaesthesia are rare,¹⁷ and similarly in our survey 57 (90.5%) respondents agreed that there was reduction of medical complications with RA and this translates to a positive outcome in overall mortality, thromboembolic events, blood loss and transfusion requirements when comparing regional to general anaesthesia.¹⁸ In our study, majority of the respondents agreed that RA is cost effective in line with earlier works.^{19,20}

Although several review articles in anesthesia journals have outlined the shortcomings of the methodology used to develop and validate patient satisfaction surveys for anesthesia services,²¹⁻²⁵ our respondents affirm that their patients were satisfied with, and willing to accept their choice of a regional anaesthesia procedure if and when a need for a second surgery arises.²⁶

Delays in induction, assessment of postoperative neurological complication and need for additional general anaesthesia were reasons for Orthopaedic surgeons not favouring regional anaesthesia. Oldman et al opined that perceived operating room delays and lack of reliability is a barrier to the popularity of regional anaesthesia.²⁷ Induction delay is only one of several factors that cause operative delays, others include lack of proper planning, failure to prepare instruments and materials, deficiencies in team work, communication gap and limited availability of trained supporting staff and time spent to teach post graduate residents.^{28,29}

In a study by George Stavrou et al, complex techniques involving nerve blocks or the placement of a central venous or an epidural catheter were excluded because they were more time consuming when compared to general anaesthesia²⁹ Therefore this delay in induction has implications not only for the surgeons but also on patients as it prolongs operating room stay of patient with economic implications especially where costs are not covered by a third party like insurance companies or national health schemes. This issue becomes more important in hospitals where no separate induction room is available.³⁰

Babita Gupta et al suggests that utilization of newer technology

that will enable timely booking, scheduling of cases, improved inter-departmental coordination, compliance with pre-anaesthetic instructions, prompt and well timed supervision of theatre proceedings will help reduce operative delays.^{28,31}

CONCLUSION

Nigerian Orthopaedic surgeons and Traumatologist are aware and knowledgeable concerning regional anaesthesia, and their attitudes favourably disposed to the practice. Most acquired their knowledge during post graduate residency, however without much practical exposure, but enough to convince their patients to accept regional anaesthesia for their surgeries. Though there is common agreement on the benefits of regional anaesthesia, but delays in induction and post-operative assessment of neurologic complications appear to attenuate the acceptance. In spite of these limitations, in a resource challenged community the cost effectiveness cannot be overlooked.

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Appendix-1: A survey of orthopaedic surgeon’s attitudes and knowledge regarding regional anesthesia. Please kindly fill this form.				
A. Location of practice (city):				
B. Type of practice				
I. Private				
II. Institutional				
C. Orthopaedics Subspecialty:				
Reasons Regional Anaesthesia Favoured				
S/N	Reasons	Strongly Agree	Agree	Don’t Agree
1	Decreases post-operative pain			
2	Safety			
3	Increased PONV**			
4	Decreased sedation/confusion			
5	Decreased medical complication			
6	Increased patients satisfaction			
7	Decreased thrombosis risk			
8	Decreased blood loss			
9	Decreased Nausea and vomiting			
10	Cost effective			
Reasons Regional Anaesthesia Not Favoured				
S/N	Reasons	Strongly agree	Agree	Don’t agree
1	Induction delays Surgery			
2	Unpredictable success			
3	Decreased assessment of neurological complication			
4	Side effect/ complication			
5	Additional GA is often needed			
6	Less effective than GA			
GA – General anaesthesia, **PONV-Post operative nerve block				
D. How did you acquire knowledge/ skills in Regional Anaesthesia?				
1.	During residency/fellowship	<input type="checkbox"/>		
2.	During clinical work	<input type="checkbox"/>		
3.	I was thought by my anaesthetic Colleague	<input type="checkbox"/>		
4.	I learnt during my undergraduate medical school	<input type="checkbox"/>		
5.	Knowledge was through journal	<input type="checkbox"/>		
6.	Seminar	<input type="checkbox"/>		

Comparative Evaluation of Single Dose of Prophylactic Antibiotics against the Post-Operative Antibiotic Therapy in Lower Segment Caesarean Section

Rajashree D. Nagarashi¹, N. S. Kshirsagar², A.J. Jadhav², R.P. Patange²

ABSTRACT

Introduction: The antibiotics with high activity against microbial agents commonly involved in surgical-site contamination and actual infection are selected for such surgeries. Combination of clindamycin and aminoglycosides are one of the most common formulation of antibiotics used for treating post-caesarean infection since they cover most of the pathogenic bacteria commonly involved in post-caesarean infection. Hence, we compared the effectiveness of single dose of prophylactic cefazolin versus postoperative caefazolin's multiple doses for prevention of post-caesarean infection.

Material and methods: A total of 600 patients reporting in the community medical centre in the gynae department were included in the study. All the deliveries occurring from March 2012 to May 2014 were included in the study. All those pregnant women who required emergency caesarean section from the year March 2012 to May 2014 were included in the study. All the patients were divided into two groups: Group A and Group B depending upon the time in which antibiotic therapy was given i.e. pre-operative or post-operative. Evaluation of post-caesarean surgical-site infection was done 72 hours after caesarean section, as well as on follow-up days (day 7 and day 30 post-caesarean section). Assessment was done by two separate clinicians who were unaware of the study. All the data were analysed by SPSS software.

Results: 4.1% patients in group A showed febrile morbidity as compared 3.5% patients in group B. All other parameters except for cost factor showed statistically non significant difference between group A and Group B patients. As far as average cost factor was concerned, patients in Group A had less cost expenditure on antibiotics as compared to group B patients.

Conclusion: Therapeutic concentration of antibiotic in serum, tissues and wound during contamination is assured by pre-operative antibiotic prophylaxis. Choice of antibiotic should be such that the picked antibiotic should be active against the bacteria that will be encountered during the surgery.

Keywords: Antibiotics, Caesarean, Cefazolin

aminoglycosides as they cover most of the pathogenic bacteria commonly involved in post-caesarean infection.^{9,10} Literature quotes evidences that demonstrate the efficacy of prophylactic antibiotics in the reduction of rates of post-partum infection among patients who underwent caesarean section.¹¹ Hence, we compared the effectiveness of single dose of prophylactic cefazolin versus postoperative caefazolin's multiple doses for prevention of post-caesarean infection.

Null hypothesis: Standard treatment difference selected was $\pm 5\%$ on the proportion of post-caesarian section infection in the subjects of the two groups.

Alternative hypothesis: The treatment difference on the proportion of post-caesarian section infection in the two arms should be less than or equal to $\pm 5\%$.

MATERIAL AND METHODS

The study was carried out in the form of two-armed, randomized, single-centre trial conducted at community medical centre in the gynae department. All the deliveries occurring from March 2012 to May 2014 were included in the study. All those pregnant women who required emergency caesarean section were included in the study. Written consent was taken from all the patients with prior information about the study protocol and procedure. Ethical clearance was taken from the Hospital Ethical Committee by giving written form of all the study procedures and steps. Patients with history of any other system illness, acute features like fever, malaise etc, any known drug/antibiotic allergy, prolonged obstructed labor, and prolonged and premature rupture of membranes were excluded from the present study. Sample size selection was done by using Lyimo et al criteria of sample estimation.¹² A total of 600 patients were included in the present study and were randomly divided into two study groups as shown in Table-1.

Group A included patients who received a single dose of 1 gm cefazolin intravenously at cord clamping while Group B included patients who were given 500 mg b.d orally for six days

INTRODUCTION

One of the top causes of pregnancy-related maternal mortality across the world is the postpartum infection.¹⁻³ The approximate incidence of post-caesarean infection is two and half percent to twenty percent worldwide.⁴⁻⁶ There is five to twenty times increased risk of postpartum infection in women undergoing caesarean section as compared to women having a vaginal delivery.^{7,8} Those antibiotics are selected for such surgeries that have activity against microbial agents commonly involved in surgical-site contamination and actual infection. One of the most common formulation of antibiotics used for treating post-caesarean infection are the combination of clindamycin and

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post-operatively.

Primary Outcome measures

The primary requisite of the study was evaluation of post-caesarean surgical-site infection. The assessment for any evidence of surgical-site infection was done 72 hours after caesarian section, as well as on follow-up days (day 7 and day 30 post-caesarean section). Assessment was done by two separate clinicians who were unaware of the study. Febrile morbidity was defined by temperature above 38°C at least 4 hours apart on two or more occasions, excluding the first 24 hours after delivery. Abdominal wound infection was defined by partial or total dehiscence, presence of purulent or serous discharge from the wound with indurations, warmth and tenderness.¹³ A diagnosis of surgical site infection was reached by using criteria put forth by Centers for Disease Control and Prevention (CDC).¹⁴⁻¹⁶ Removal of bladder catheter was done in both the groups after 24 hours. After 48 hours, the occlusive dressing was removed and the wound was left open. Assessment of for signs of infection was done on days 3, 7 and 30 post-operatively. Selection of these days was done because on day 3 the patient is normally discharged from the hospital if she is doing well, day 7 is when stitches on the wound are removed and day 30 is for final follow up according to CDC definition of surgical site infection. within 30 days of follow-up, the diagnosis of surgical site infection was made if the infection occurs. All the data were analysed by SPSS software. Calculation of cumulative incidence was done as the following proportion: number of cases noted over total number of participants in each study group. Time to develop post-caesarean infection was noted and used to calculate the incidence rate (IR) of post-caesarean infection. p-value of less than 0.05 was considered as significant.

RESULT

Figure-1 show the demographic and baseline details of the patient. 4.1% patients in group A showed febrile morbidity as compared 3.5% patients in group B. All other parameters except for cost factor showed statistically non significant difference between group A and Group B patients as shown in Table-2. As far as average cost factor was concerned, patients in Group A had less cost expenditure on antibiotics as compared to group B patients.

DISCUSSION

A high resistance of antibiotic resistance has been a globally concern regarding the misuse of antibiotics leading to suboptimal treatments.¹⁷⁻¹⁹ Antibiotic resistance is now regarded as a major public health issue because infections by multidrug resistant bacteria lead to increased mortality, morbidity and increased hospital stays and the armamentarium against these bacteria is dwindling rapidly. Many prescriptions are inappropriate and there is some evidence of compulsive antibiotic prescribing.²⁰ It is generally recommended that antibiotic prophylaxis is given in most types of surgery, but the choice of therapy is controversial.²¹ Hence we evaluated and compared the effect of single dose of prophylactic cefazolin versus postoperative caefazolin's multiple doses for prevention of post-caesarean infection. The results of the present study show that prophylactic use of a single dose of cefazolin is equivalent in efficacy to the postoperative caefazolin's multiple doses in caesarean section.

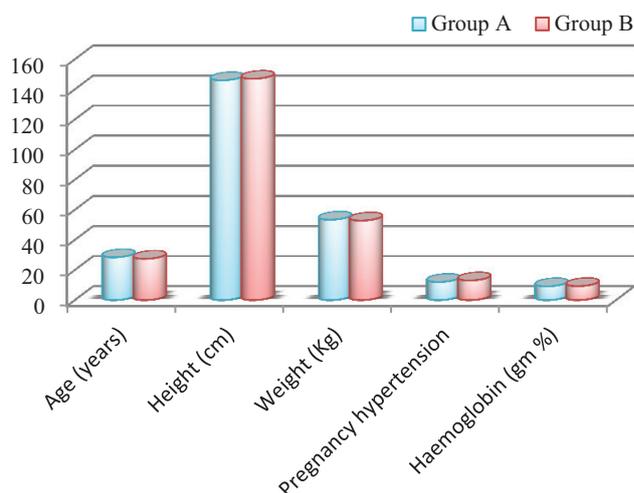


Figure-1: Demographic and baseline characteristics

Groups	No. of Patients	Parameter
Group A	300	Patients with pre-operative antibiotic prophylaxis
Group B	300	Patients with post-operative antibiotic prophylaxis

Table-1: Division of patients in the study group

Variable	Group A (% of patients)	Group B (% of patients)	p-value
Febrile morbidity	4.1%	3.5%	1.451
Endometritis	4.9%	5.1%	2.142
Urinary tract infection	2.4%	3.1%	0.784
Wound infection	6.7%	7.2%	1.684
Other antibiotics used	10.8%	9.7%	0.842
Hospital stay	9.1	9.5	0.945
Average cost	41	230	0.002

Table-2: Post-Operative Complications in the study

Cumulative incidence of surgical-site infection was statistically similar for the administration of prophylactic pre-operative single dose antibiotic as compared to post-operative multiple doses as shown in Table-2. The results of our study were in correlation with the results of Pore et al and Slobogean et al who observed similar results in their respective studies.^{22,23} One of the parameters which should also be considered while planning treatment protocol is the cost – effectiveness. Single dose regime is associated with lower medication cost as compared with multiple doses regime. Furthermore, Literature from the past previous studies have proved that the low prevalence of low-level resistance to gentamicin in same setting.^{24,25} In terms of most judicious practice, a single dose of a single antibiotic with a spectrum appropriate to cover the most common infecting organisms is usually sufficient. Literature quotes numerous facts that publish guidelines to cover most instances where prophylaxis is recommended and where it is not considered appropriate. Appropriate antibacterial selection remains the complex problem followed by frequency, duration and timing of each dose.²⁶ A caesarean section is classified as a clean-contaminated operation. Endometritis, wound infection, urinary tract infections are common adverse outcomes associated with caesarean section. Staphylococcus aureus, E.

coli and beta haemolytic Streptococci are the most common infecting organisms. It is a well established fact that antibiotic prophylaxis in LSCS surgery reduces the risk of infection and endometritis in all types of patients and has proven to be of benefit even to those at the lowest risk.²⁷ Shah et al also compared the single dose prophylactic antibiotics versus five days antibiotic in cesarean section and concluded that single dose antibiotics are effective as multiple doses in prevention of post-operative infections in caesarean sections. Therefore, Careful periodic surveillance of antibiotic prophylaxis should be done to detect the emergence of drug resistant strains of bacteria.²⁸

CONCLUSION

Therapeutic concentration of antibiotic in serum, tissues and wound during contamination is assured by pre-operative antibiotic prophylaxis. Choice of antibiotic should be such that the picked antibiotic should be active against the bacteria that will be encountered during the surgery. Also, to avoid resistance, the drug administration should be done for the shortest period to minimize the development of resistance. Also, the adverse effects of the drug should be minimal. Further studies with larger study group required in the same field to further explore the effects of pre-operative antibiotics in controlling post-operative infections.

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Correlation of Clinical, Radiological and Histopathological Diagnosis among Patients with Sinonasal Masses

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ABSTRACT

Introduction: Neoplasms of the sinuses and nasal cavity account for 0.2–0.8 % of all carcinomas. The present study was carried out to find out correlation of clinical, radiological and histopathological diagnosis of sinonasal masses.

Material and Methods: The present study was carried out on 60 patients of any age and sex randomly selected who presented with sinonasal masses in the department of Otorhinolaryngology and Pathology in Guru Gobind Singh Medical College and Hospital, Faridkot. These cases were subjected to routine hematological and biochemical evaluation, nasal endoscopy, x- ray paranasal sinuses/ CT scan and biopsy. Tissues were routinely processed for histopathological sections of 5 micron thickness and were stained by hematoxylin and eosin stain. Special staining by reticulin, von gieson, PAS and masson's trichrome were undertaken whenever applicable. The data so obtained was compiled, analyzed and valid conclusion drawn.

Results: In present study, histopathology showed the maximum cases (42 cases) of inflammatory polyps. On the basis of radiology, out of 60 patients, 43 patients (71.66%) were non-neoplastic, 10 patients (16.66%) were benign and 7 patients (11.66%) were malignant. In all the 60 patients, clinical diagnosis correlated with the radiologic Histopathological examination (HPE) report made the clinical diagnosis in 6 (10%) patients in which clinically inconclusive diagnosis of unilateral sinonasal mass was made and in 54 patients (90%) clinical and HPE diagnosis was same. All 6 patients had clinically inconclusive diagnosis of unilateral sinonasal mass, all of which were reported after HPE, 1 case ameloblastoma of maxilla, 1 case inverted papilloma, 1 case rhinoscleroma, 2 cases round cell tumour, in 2 cases immunohistochemistry confirmed as extramedullary plasmacytoma and esthesioneuroblastoma.

Conclusion: Comparison of histopathological findings with clinical findings showed that, a careful histopathological examination (HPE) is necessary to analyze the specific type of a lesion. Thus, HPE of the removed tissue is mandatory to provide the actual diagnosis of the various conditions identified as a sinonasal mass.

Keywords: Sinonasal masses; Deviated nasal septum; Otorhinolaryngologists

incidence of 1 to 4 % of the population. Neoplasms of the sinuses and nasal cavity account for 0.2–0.8 % of all carcinomas.³ The present study was carried out to find out correlation of clinical, radiological and histopathological diagnosis of sinonasal masses.

MATERIAL AND METHODS

The present study was conducted to study clinicopathological features, radiological findings of sinonasal masses. The prospective study was carried out on 60 patients of any age and sex randomly selected who presented with sinonasal masses in the department of Otorhinolaryngology and Pathology in Guru Gobind Singh Medical College and Hospital, Faridkot.

Prior approval from the institute ethics and research committee was taken. Informed consent was taken from all cases. Detailed clinical history was taken with reference to age, sex, residence, occupation, family history, past history, any allergic disorder, any addictive habits. Detailed clinical local and general examinations were done according to proforma attached with special reference to nose, paranasal sinuses and oral cavity. These cases were subjected to routine hematological and biochemical evaluation, nasal endoscopy, x- ray paranasal sinuses/ CT scan, FNAC whenever required, biopsy. Tissues were routinely processed for histopathological sections of 5 micron thickness and were stained by hematoxylin and eosin stain. Special staining by reticulin, von gieson, PAS and masson's trichrome were undertaken whenever applicable. The data so obtained was compiled, analyzed and valid conclusion drawn.

RESULTS

On diagnostic nasal endoscopy (Table-1), 31 non-neoplastic lesions had bilateral nasal mass, 12 had unilateral nasal mass. All benign neoplastic and malignant lesions presented with unilateral nasal mass. Bleeding on touch was found in 4 benign neoplastic and 6 malignant lesions. Deviated nasal septum (DNS) was seen in 20 non-neoplastic lesions, 1 benign neoplastic lesions and 3

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INTRODUCTION

The nose is the most prominent part of the face with functional and considerable aesthetic importance. Anatomical position of the nose and its passage have been considered as the direct route to the brain, individual's source of intelligence and spirituality.¹ Presence of any mass in the nose and paranasal sinuses seems to be a simple problem; however it raises many questions about the differential diagnosis.² A variety of sino-nasal conditions (neoplastic, non neoplastic and inflammatory) are very common lesions encountered in clinical practice with the reported

malignant lesions. Turbinate hypertrophy was seen in 12 non neoplastic lesions and 3 benign neoplastic lesions. In our study all 60 patients underwent CT scan (Table-2). In non-neoplastic lesions 12(27.90%) cases presented with unilateral nasal mass, 31(72.09%) cases presented with bilateral nasal mass. All benign neoplastic and malignant lesions presented with unilateral nasal mass. Bilateral paranasal sinus mass CT scan finding was found in 31(72.09%) cases of non-neoplastic lesions and Unilateral paranasal sinus mass CT scan finding was found in 9(20.93%) cases of non-neoplastic lesions, 6(60%) cases of benign neoplastic lesions, 7(100%) cases of malignant lesions. Deviated nasal septum (DNS) was seen in 20(46.41%) cases of non-neoplastic lesions, 1(10%) case of benign neoplastic lesion and 3(42.86%) cases of malignant lesions. Turbinate hypertrophy was seen in 12(27.90%) cases of non-neoplastic lesions and 3(30%) cases of benign neoplastic lesions. Nasopharyngeal mass was found in 9(20.93%) cases of

non-neoplastic lesions and 1 case of benign neoplastic lesion. Bone erosion was seen 1(2.37%) case of non-neoplastic lesion and 7(100%) cases of malignant lesions. Neck nodes was seen 1(2.37%) case of non-neoplastic lesion and 3(42.86%) cases of malignant lesions.

In present study, histopathology showed the maximum cases (42 cases) of inflammatory polyps (table-3).

In our study all 60 patients underwent CT scan. On the basis of radiology, out of 60 patients, 43 patients (71.66%) were non-neoplastic, 10 patients (16.66%) were benign and 7 patients (11.66%) were malignant. In all the 60 patients, clinical diagnosis correlated with the radiologic diagnosis (table-4). Comparison of clinical and radiological findings in present study showed that the radiological findings were consistent with that of clinical suspicion. In our study, Histopathological examination (HPE) report made the clinical diagnosis in 6 (10%) patients in which clinically inconclusive diagnosis of unilateral sinonasal mass was made and in 54 patients (90%) clinical and HPE diagnosis was same. All 6 patients had clinically inconclusive diagnosis of unilateral sinonasal mass, all of which were reported after HPE, 1 case ameloblastoma of maxilla, 1 case inverted papilloma, 1 case rhinoscleroma, 2 cases round cell tumour, in 2 cases immuno-histochemistry confirmed as extramedullary plasmacytoma and esthesioneuroblastoma. Comparison of histopathological findings with clinical findings showed that, a careful histopathological examination (HPE) is necessary to decide the nature of a specific lesion. The HPE of the removed tissue provides the actual diagnosis of the varied conditions labeled as a sinonasal mass.

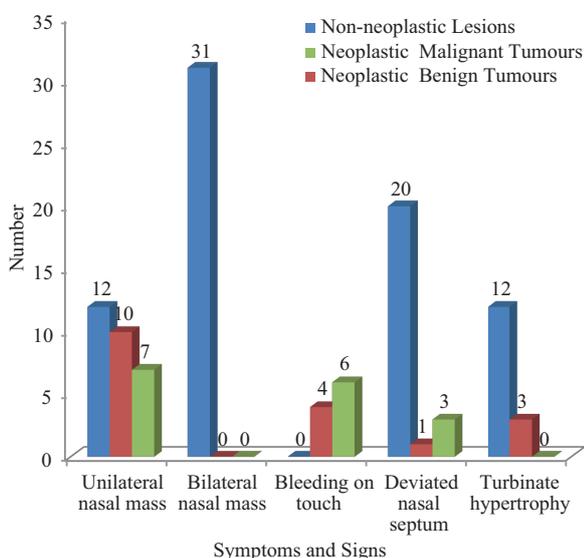


Figure-1: Nasal endoscopy findings

Symptoms and signs	Non-neoplastic Lesions	Neoplastic	
		Benign Tumours	Malignant Tumours
Unilateral nasal mass	12	10	7
Bilateral nasal mass	31	0	0
Bleeding on touch	0	4	6
Deviated nasal septum	20	1	3
Turbinate hypertrophy	12	3	0

Table-1: Nasal endoscopy findings

DISCUSSION

A variety of non-neoplastic and neoplastic conditions involve the nasal cavity (NC), paranasal sinuses (PNS) and these are very common lesions encountered in clinical practice. The presenting features and *symptomatology* and advanced imaging technique helps to draw a provisional diagnosis but histopathological examination remains the gold standard to illustrate definitive diagnosis.⁴

In the present study, there were 10 cases of benign neoplastic sinonasal masses. They constituted 16.66% of all sinonasal masses. 90% of those presented with complain of nasal obstruction. 60% patient gave history of nasal bleed. This high number of cases with nasal bleed was due to higher number (30%) of cases of angiofibromas invariably presenting with episodes of minor to significant nasal bleed. Similar finding was noted by Khan N et al,⁵ Shashin K et al⁶ and Swamy KVN et al.⁷ Facial swelling was seen in 20%, and ear findings in 10%

CT scan finding	Non-neoplastic Lesions	Neoplastic	
		Benign Lesions	Malignant Lesions
Unilateral nasal mass	12(27.90%)	10(100%)	7(100%)
Bilateral nasal mass	31(72.09%)	-	-
Unilateral paranasal sinus mass	9(20.93%)	6(60%)	7(100%)
Bilateral paranasal sinus mass	31(72.09%)	-	-
Nasopharyngeal mass	9(20.93%)	1(10%)	-
Deviated nasal septum	20(46.41%)	1(10%)	3(42.86%)
Turbinate Hypertrophy	12(27.90%)	3(30%)	-
Bone erosion	1(2.37%)	-	7(100%)
Neck nodes	1(2.37%)	-	3(42.86%)

Table-2: Computer tomography (CT Scan) findings seen in different types of sinonasal masses

of cases. Ear symptoms included pain, discharge and decreased hearing due to secretory otitis media or adhesive otitis media. Pain is an important feature in the present study, complained by 28.57% patients diagnosed with malignancies, so it is imperative that every case who presents with symptoms of headache or facial pain should be examined thoroughly to find out any hidden malignant condition.

Nasal endoscopy permits a thorough examination of intranasal anatomy and identification of pathology involving anterior rhinoscopy. The technique is recognized as more sensitive than CT scan for the investigation of accessible disease and gives

more important information regarding recurrence / residual disease postoperatively.

The diagnostic algorithm for sinus diseases continues to evolve along with the advances in imaging modality. Earlier, plain radiographs were one of the basis of diagnosis of the diseases involving sinuses but now high resolution computerized tomography have replaced plain radiographs for the investigation of the sinus diseases. CT scan is an useful and informative aid in diagnosis and tumour staging and for proper management. All the patient of sinonasal masses had undergone CT scan.³

Several studies have provided evidence that CT and symptoms do not necessarily correlate. In a study by Bolger WE et al,⁸ 42% of asymptomatic patients had mucosal changes on CT scan. In a study Stankiewicz JA et al,⁹ examined 78 patients meeting chronic rhinosinusitis symptom criteria of which only 47% had evidence of chronic rhinosinusitis on CT. A prospective study of patients without chronic rhinosinusitis by Flinn J et al,¹⁰ found that 27% had mucosal changes suggestive of chronic rhinosinusitis.

Clinical, radiological and CT findings for each adjacent sub site were tabulated and compared by Tandon DA et al¹¹ in consecutive cases undergoing surgery for malignant lesions of the maxillo-ethmoid complex and found that tumour extensions into nose, palate, cheek and orbit were identified correctly in a high proportion of cases clinically and radiologically.

There is lack of general harmony about the need for routine

Histopathological diagnosis	No. of cases	%
Inflammatory Polyp	42	70%
Angiofibroma	3	5%
Squamous Cell Carcinoma	3	5%
Invasive Fungal Sinusitis	1	1.67%
Inverted Papilloma	1	1.67%
Lobular Capillary Haemangioma	3	5%
Adenocarcinoma	2	3.33%
Esthesioneuroblastoma	1	1.67%
Extramedullary Plasmacytoma	1	1.67%
Rhinoscleroma	1	1.67%
Ameloblastoma	1	1.67%
Hemangiopericytoma	1	1.67%

Table-3: Histopathological diagnosis of sinonasal masses

Clinical Diagnosis	No. of Patients	Radiological Diagnosis	No. of Patients	Histopathological Diagnosis	No. of Patients
B/L Nasal Polyposis	30	B/L Sinonasal Polyposis	30	Inflammatory Polyp	30
Invasive Fungal Sinusitis	1	(B/L blackish nasal mass) Invasive Fungal Sinusitis	1	Invasive Fungal Sinusitis	1
Unilateral Nasal Polyp (Antrochoanal Polyp)	9	Antrochoanal Polyp	9	Inflammatory Polyp	9
Unilateral Sinonasal Mass	6	Expansile Lytic Lesion Maxilla + Nasal Mass ?Ameloblastoma	1	Ameloblastoma	1
		Nasal Mass	1	Inverted Papilloma	1
		Nasal Mass	1	Rhinoscleroma	1
		Sinonasal Mass	1	Hemangiopericytoma	1
		Nasal Tumour ? Malignant	2	Extramedullary Plasmacytoma	1
				Esthesioneuroblastoma	1
Malignancy? Maxilla	3	Malignancy Maxilla	3	S.C.C. Maxilla	3
Malignant? Mass Nasal Cavity	2	Malignant Tumour Ethmoid	2	Sinonasal Adeno Carcinoma	2
Rhinolith	2	Rhinolith	2	Rhinolith	2
Angiofibroma	3	Angiofibroma	3	Angiofibroma	3
Haemangioma	3	Haemangioma	3	Haemangioma	3
Nasolabial cyst	1	Nasolabial cyst	1	Nasolabial cyst	1
	60		60		60

Table-4: Correlation of Clinical, Radiological and Histopathological Diagnosis

Symptoms and signs	Khan N et al ⁵	Shashin K et al ⁶	Swamy KVN et al ⁷	Present study
Nasal obstruction	86%	100%	56%	90%
Nasal discharge	76%	82%	50%	60%
Bleeding per nose	76%	75.8%	53%	60%
Facial swelling	20%	41%	29%	20%
Ear symptoms	6%	17%	9%	10%
Alteration of smell	-	-	-	20%
Headache	-	-	-	20%

Table-5: Comparison of clinical presentation of benign neoplastic sinonasal tumours in present study with earlier studies

Symptoms and signs	Khan et al	Swami et al	Present study
Nasal obstruction	70%	50%	100%
Nasal discharge	21%	60%	57.14%
Bleeding per nose	70%	50%	71.43%
Facial swelling	64%	74%	57.14%
Ear symptoms	23%	14%	28.57%
Ocular symptoms	41%	15%	28.57%
Headache and facial pain	-	-	28.57%

Table-6: Comparison of clinical presentation of malignant tumours in present study with earlier studies

histology for nasal polyps among ENT surgeons. According to Alun-Jones et al the clinical selection of nasal polyps for histology has been recommended as a possible compromise between additional hospital cost and/or workload and acceptable medical practice.¹² However, in this study, the use of clinical criteria as a method for selecting nasal polyps for histology proved inadequate, as several cases of polyps with sinister pathology would have escaped diagnosis.

In a study of 50 patients of nasal polyps by Chopra H,¹³ the radiological findings matched with clinical suspicion in only 70% cases. The allergic fungal polyps were the most correctly diagnosed radiological condition in their study. This was due to the high percentage of hyperdense signal in the sinus cavities (caused by calcium salts) detected on CT scan paranasal sinus. The diagnosis of non-specific sinonasal polyps, antrochoanal polyp and mucormycosis was correctly established in most of the cases. There was a difference of opinion between the clinician and the radiologist in about 20% of non-neoplastic lesions. The correct diagnosis of neoplastic lesions was established in only 22% of cases (2 out of 9 patients). In most cases it was inadequate to predict the histological subtype and to differentiate non-neoplastic versus neoplastic and benign versus malignant lesions.

In our study all 60 patients underwent CT scan. On the basis of radiology, out of 60 patients, 43 patients (71.66%) were non-neoplastic, 10 patients (16.66%) were benign, and 7 patients (11.66%) were malignant. In all the 60 patients, clinical diagnosis correlated with the radiologic diagnosis. Comparison of clinical and radiological findings in present study showed that the radiological findings were consistent with that of clinical suspicion. Bist SS et al¹⁴ reported similar findings.

In our study, HPE report made the clinical diagnosis in 6 (10%) patients in which clinically inconclusive diagnosis of unilateral sinonasal mass was made and in 54 patients (90%) clinical and HPE diagnosis was same. All 6 patients had clinically inconclusive diagnosis of unilateral sinonasal mass, all of which were reported after HPE, 1 case ameloblastoma of maxilla, 1 case inverted papilloma, 1 case rhinoscleroma, 2 cases round cell tumour, in 2 cases immuno-histochemistry confirmed as extramedullary plasmacytoma and esthesioneuroblastoma. Comparison of histopathological findings with clinical findings showed that, a careful histopathological examination (HPE) is necessary to decide the nature of a specific lesion. The HPE of the removed tissue provides the actual diagnosis of the varied conditions labeled as a sinonasal mass. Thus, studies point out to the common finding that histopathological examination still remains the gold standard for diagnosis in most cases.

CONCLUSION

From this study we have reached to the inference that tumours of the paranasal sinuses are rare but when they occur they are extremely notorious. It is only if they are diagnosed at an early stage and treated radically, the patient have a chance of good prognosis. Histopathological examination still remains the gold standard for diagnosis in most cases.

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Impact of Peer Participation in Learning

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ABSTRACT

Introduction: Teaching innovation aims at cultivating creative talents and realizing the heuristic method of teaching. More effective student-centric learning methods are now being utilized to encourage active student participation and creative thinking. One of these methods is peer learning, in which peers learn from one another, involving active student participation and where the student takes responsibility for their learning. **Aim and Objectives:** To study the role of participatory learning in improving the performance of third and fourth semester under graduate medical students, on improvement in scoring marks in family presentation in Community Medicine by peer participation.

Material and methods: During the clinical posting of third to fifth semester students in the dept. of Community Medicine, the student has to present four families. The methodology adopted here is that the student will present one family in the conventional manner i.e. after the class room teaching, the student will go to the field and after working up the family, will present the family to the teacher. After the completion of the workup of the second allotted family, students were divided into two groups Group A and Group B. An intervention was made in the presentation of the second family in Group B that before presenting the family to the teacher, two students discussed and presented their worked up family to each other and then presented it to the teacher. A comparison of the marks obtained in the second family will be utilized as outcome measure to compare the performance before and after intervention.

Results: A total of 48 students were participated in the study. In the presentation of the second family, the mean score attained by the Group A is 11.87 in comparison of the first presentation i.e. 10.91. The observed difference was found to be statistically significant (p value < 0.05). The mean score obtained by the Group B in second presentation was 12.9 in comparison of 11 in first presentation. This difference was more than that of group A and also was found statistically significant. The difference of the marks in the second presentation of Group B was found higher (mean difference 1.91) than that of Group A (mean difference 0.96). It was found statistically significant ($p=0.028$). It shows peer participatory learning has an impact in scoring more in this exercise.

Conclusion: Peer learning has a positive impact in the learning process. Students improved in their performance by peer learning.

Keywords: Peer Learning, Teaching innovation

INTRODUCTION

Teaching innovation aims at cultivating creative talents and realizing the heuristic method of teaching, so as to increase students' creativity and cultivate talents through creativity.¹ Innovative education unlike the traditional education is a process which helps the student to develop skills such as: Self directed learning, Problem-solving, Critical thinking, Information searching, Clinical reasoning, Continuing Education and Emotional and Social support.^{1,2} Now-a days, more efficient student-centric learning approaches

are being taken into consideration to promote active student participation and thus to endorse creative thinking.³⁻⁵ Peer learning is one of these such methods in which student takes responsibility for their learning, colleagues learn from one another along with this method involves active student participation.⁶ Peer learning is known by different interchangeable titles such as "peer coaching," "peer mentoring," "cooperative learning," "mentoring," "peer review learning," "problem-based learning," and "team learning."

This method has been utilized in education to address critical thinking, psychomotor skills, cognitive development, clinical skills and academic gains.⁷⁻¹⁰ One type of peer learning is problem-based learning (PBL) which is characterized by students learning from each other and from independently sourced information.¹¹ Alternatively peer tutoring engages individuals with similar situations helping others to learn and these sessions may occur one-on-one or as small group sessions.¹² The current study aimed to address the research question: does the participatory learning improves the performance of undergraduate medical students To study the role of participatory learning in improving the performance of third, fourth and fifth semester under graduate medical students, in family presentation in Community Medicine during their clinical posting by peer participation.

MATERIAL AND METHODS

The project was carried out with the MBBS Second Professional students: third, fourth and fifth Semester; 2014 Batch. Yearly batch of MBBS consists of 100 students. From the point of view of clinical posting, they are divided into four batches, A,B,C,D each of 25 students. In third to fifth semester a batch of 25 students is posted for 8 weeks in the department for clinical posting. During the study period, two batches of 25 students of fresh batch and 25 students of the old batch were posted. During this clinical posting, four families are allotted to each student for the purpose of field teaching and for acquiring skills to improve family and community health. In routine, after classroom teaching, the students visit to the field in their respective allotted families and work up the family for presentation to the teacher. The methodology adopted here is that the student will present one family in the conventional manner i.e. after the class room teaching, the student will visit to the field and after working up the family, will present the family to the teacher.

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After the completion of the workup of the second allotted family, from the point of view of the study, students were divided into two groups Group A and Group B. An intervention was made in the presentation of the second family in Group B that before presenting the family to the teacher, two students discussed and presented their worked up family to each other and then presented it to the teacher. The teacher who was taking the family presentation was unaware of the information that to which group the students belong group A or B.

Group A presented the second family, without discussion among the students. Evaluation of the students had been made on the basis of the marks obtained in the presentation. A comparison had been made of the marks obtained in the second presentation of the students among Group A and Group B. The eligibility criteria to participate in the study were that each student must be present in both the presentations, both the first and second family presentation. The students who missed either first or second presentation were excluded from the study. A total of 48 students participated in the study.

Information was converted into data and data were manually tabulated and analyzed in the light of suitable statistical tests.

RESULTS

A total of 48 students were participated in the study. In the presentation of the first family, the mean score attained by Group A is 10.91 and by the Group B is 11. From the point of view of statistics, the observed difference in attaining the marks was not found to be significant.

In the presentation of the second family, the mean score attained by the Group A is 11.87 in comparison of the first presentation i.e. 10.91 (table-1 and Figure-1). The observed difference was found to be statistically significant (p value<0.05). It shows that the performance of the students increases with the repetition of the same type of exercises. The mean score obtained by the Group B in second presentation was 12.9 in comparison of 11 in first presentation, The difference again in first and second presentation of Group B was found statistically significant table-2 and Figure-2).. The difference of the marks in the second presentation of Group B was found higher (mean difference 1.91) than that of Group A (mean difference 0.96). Further, the observed difference of mean of the differences of second presentation of Group A and of Group B was again statistically significant (p=0.028). It shows peer participatory learning has an impact in scoring more in this exercise.

DISCUSSION

The term “peer” refers to individuals who have comparable skills or a harmony of experiences.¹³ Both these definitions suit the concept of peer learning and were applied in the present study.

The purpose of this project was to answer the question whether undergraduate medical students benefit from peer learning or not. The statistically significant difference between the presentation of the second family of the two groups shows definitely the performance of the students improves with the peer learning participation as indicated by the outcome measure. Peer learning was associated with increased levels of knowledge in a number of areas such as problem solving and communication.^{14,15} Tiwari et al.¹⁶ showed that critical thinking

Sr. No. of Student	In first presentation	in second presentation
1	12	13
2	13	13
3	14	15
4	10	8
5	11	12
6	11	13
7	12	13
8	8	10
9	10	12
10	12	13
11	11	12
12	10	10
13	9	7
14	13	14
15	10	12
16	11	12
17	14	15
18	10	12
19	7	10
20	11	12
21	10	11
22	10	10
23	10	12
24	13	14
Mean	10.91	11.87
t=.00068	P value	.00025

Table-1: Marks Obtained in Family presentation by students of group A

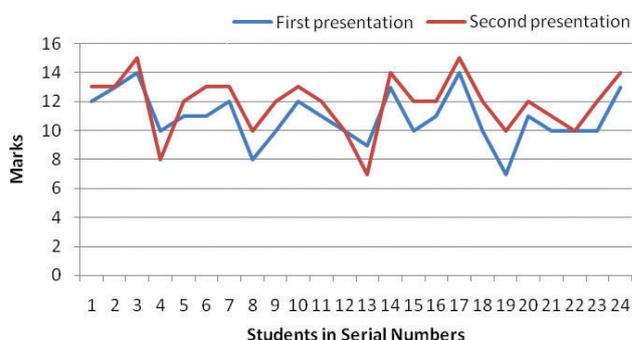


Figure-1: Marks Obtained in Family presentation by students of group A

was improved in students using PBL ($P = 0.0048$) whilst Daley et al.¹⁴ reported that students showed improvement in cognitive and motor skills.

Johnson KA¹⁷ evaluated the peer effect on academic achievement among public elementary school students and found that the peer effect is a strong influence on academic achievement. The peer effect is independent of other factors such as race, ethnicity, gender, income, and other background variables. Mulder RA et al¹⁸ evaluated students perceptions before and after participation in peer review process and reported high satisfaction levels with the peer-review process and its positive impact on their learning, and particularly showed an enhanced appreciation of the influence of review writing on learning. Ravanipour M et al¹⁹ evaluated nursing students for peer learning and reported general satisfaction as the method helps in extensive learning with little or no stress than conventional learning methods.

Sr. No. of Student	In first presentation	in second presentation
1	11	13
2	12	13
3	11	14
4	10	14
5	10	13
6	13	14
7	11	12
8	11	15
9	12	13
10	11	13
11	13	14
12	10	13
13	9	12
14	11	12
15	13	14
16	11	13
17	12	13
18	12	12
19	12	14
20	11	13
21	10	13
22	10	12
23	10	11
24	8	10
Mean	11	12.9
t= .000	P value	<.0001

Table-2: Marks Obtained in Family presentation by students of group B

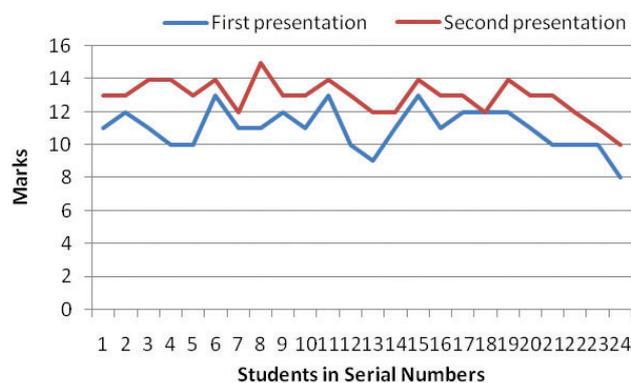


Figure-2: Marks Obtained in Family presentation by students of group B

Thus, peer learning is a constructive and helpful method for professional students for learning the clinical skills before they get a job.

Peer teaching is a type of cooperative learning in which both teacher and learner mutually benefit from their interactions. Medical students serving as peer teachers in a laboratory setting reported improved study habits and better attitudes towards the subject matter. The peer teachers also benefited from a review of material, improved their communication skills, and increased their self-confidence. Medical students serving as Clinical Skills Teaching Assistants (CSTA) reported enjoying their roles as peer teachers and becoming more comfortable giving and receiving feedback on clinical performance. Learners cited benefits as well, stating that peer assisted learning experiences reinforced

self-confidence, enhanced clinical skills and acquisition of new information, reinforced previously learned information and techniques, and improved ability to accept feedback. Learners reported feeling comfortable with their peer teachers and thought they provided useful and non-threatening feedback.²⁰⁻²¹

CONCLUSION

Peer learning has a positive impact in the learning process. Students improved in their performance by peer learning. This study shows that under graduate medical students could benefit from peer learning, with an increase in confidence and a decrease in anxiety.

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To Study Epidemiological Factors Associated with Road Traffic Accident Cases Coming to Civil Hospital in District Amritsar, Punjab

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ABSTRACT

Introduction: Countries are passing through significant urbanization, motorization, industrialization and a change in socio-economic values. India is no different to this change. Due to these changes, Road Traffic Accidents have become the first public hazard in the world which results in one of the largest threat against human lives and safety. Aim of the study was to study demographic variables and epidemiological determinants associated with Road Traffic Accidents.

Material and Methods: The current Cross - Sectional study was carried out at Civil Hospital Amritsar among 200 consecutive cases of Road Traffic Accidents (RTA) admitted through emergency of Civil Hospital Amritsar from September 2013 to December 2013.

Results: It was observed that maximum number of victims were between 11-40 years of age constituting 127(63.5%) of total victims of road traffic accidents i.e more young patients were involved in road traffic accidents. Demographic and epidemiological factors determining RTA's like age, education and area of residence were studied and findings revealed that majority of the affected victims (52.5%) belonged to rural area and maximum accidents (62.0%) took place between 2 pm to 10 pm. Majority of the cases of RTA's i.e 173 (86.5%) had received no education or were educated just up to matric.

Conclusion: Road traffic injuries are a major but neglected public health challenge that requires concerted efforts for effective and sustainable prevention. Strict enforcement of traffic laws is the need of the hour.

Keyword: Epidemiological Factors, Road Traffic Accident Cases

INTRODUCTION

Trauma in India is an increasingly significant problem, particularly in light of rapid development and increasing motorization. Social changes are resulting in alterations in the epidemiology of trauma. Countries are passing through significant urbanization, motorization, industrialization and a change in socio-economic values. India is no different to this change. Due to these changes, Road Traffic Accidents have become the first public hazard in the world which results in one of the largest threat against human lives and safety.¹

Thus RTA is a collision between vehicles and pedestrians; between vehicles and animals or between vehicles and geographical or architectural obstacles.

Ninety one percent of world's fatalities on the roads occur in low income and middle income countries, even though these countries have approximately half of the world's vehicles. According to World Health Organization (WHO), road traffic injuries are the sixth leading cause of death in India with a greater share of hospitalization, deaths, disabilities and socio-economic losses in young and middle - aged population.²

Accidents, tragically, are not often due to ignorance, but are due to carelessness, thoughtlessness and over confidence. William Haddon (Head of Road Safety Agency in USA) has pointed out that road accidents were associated with numerous problems each of which needed to be addressed separately.³ Human, vehicle and environmental factors play roles before, during and after a trauma event.⁴ The Aim of conducted study was To study demographic variables and epidemiological determinants associated with road traffic accidents.

MATERIAL AND METHODS

The current Cross - Sectional study was carried out at Civil Hospital Amritsar after obtaining ethical approval from hospital ethical board. The study included 200 consecutive cases of Road Traffic Accidents (RTA) admitted through emergency of Civil Hospital Amritsar from September 2013 to December 2013 based on purposive sampling. For the purpose of the study; A Road Traffic Accident was defined as accident which took place on the road between two or more objects, one of which must be any kind of a moving vehicle. Any injury on the road without involvement of a vehicle (eg. a person slipping and falling on the road and sustaining injury) or injury involving a stationary vehicle (eg persons getting injured while washing or loading a vehicle) or deaths due to RTA were excluded from the study. A pretested semi structured questionnaire specially designed for this purpose was used for interviewing the accident victims. Where the condition of the victim did not warrant the interview, the relatives or attendants were interviewed.

The study incorporated demographic variables (age, gender, area of residence, education and occupation) and epidemiological determinants (time of accident, condition of the road, training of the driver, type of vehicle involved).

STATISTICAL ANALYSIS

Data was entered in Microsoft Excel. Data was analysed via SPSS (Version 20). Interpretation of the collected data was done by using appropriate statistical methods like percentage and proportions.

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RESULTS

Demographic Variables associated with Road Traffic Accidents

Table-1 depicts demographic variables associated with road traffic accidents.

174 (87%) victims of Road Traffic Accidents were males and only 26 (13%) were females. Majority of the cases i.e 27.5% were between age group of 21-30 followed by 19.5% who were between age group of 31-40. It was observed that maximum number of victims were between 11-40 years of age constituting 127(63.5%) of total victims of road traffic accidents i.e more young patients were involved in road traffic accidents. Also majority of the cases of RTA's i.e 173 (86.5%) had received no education or were educated just up to matric. More number of victims 105 (52.5%) were from rural area compared to 97 (47.5%) who were from Urban area.

Table-2 depicts time of the day of occurrence of accident. It shows that majority of the accidents i.e 124 (62.0%) occurred between 2.00 pm to 10.00pm followed by 6.00 am to 2.00 pm (29.0%).

Table-3 shows that maximum number of persons 101 (50.5%) involved in road traffic accidents were drivers, 59 (29.5%) were passengers and only 40 (20%) were pedestrians. Also 116 (58%) of the vehicles involved were two - wheelers followed by 68(34.0%) four wheelers.

Table-4 shows that majority of the persons 47 (23.5%) involved in RTA were intoxicated on the day of accident, alcohol being main intoxicant. 17% were having stress at the time of accident which were emotional, physical or social stress and 30 (15%) were fatigued. 3.5% (7) had medical illness which could have contributed to accident. Main factors in vehicles responsible for road accidents were being rash driven 24% (48) which led to accident. 18.5% (37) were not well maintained and not regularly serviced and were very old models. 19 (9.5%) of the vehicles contributing to accidents had defects like failure of brakes, defects in head light or bursting of tyre.

Figure-1 shows that majority (44.5%) accidents took place on city roads followed by link roads (31.5%).

Figure-2 shows that maximum accidents (19.5%) occurred due to pits on the roads followed by uncontrolled crossings (18.5%) and slippery roads (8.5%).

DISCUSSION

The current study revealed that 87% of the victims of Road Traffic Accidents were males and predominantly youngsters(63.5%) were affected. Also in our study majority of the affected victims (52.5%) belonged to rural area. Maximum accidents (62.0%) took place between 2 pm to 10 pm. These findings are in consonance with study conducted by Singh D et al (2014) in Chandigarh in which male preponderance (76%) was observed throughout the study period with youngsters being more commonly involved. The study also supported that more casualties were observed in rural (60.4%) area as compared to Urban area exhibiting a statistically significant difference ($p < 0.05$).³ The current study shows that the people of the most active and productive age group are involved in RTAs, which adds a serious economic loss to the community. Dandona R et al (2011) in a study conducted in Hyderabad reported male youngsters being more involved in Road Traffic Accidents as

Demographic variables		
Gender	No. of cases	Percentage
Male	174	87.0%
Female	26	13%
Age	No. of cases	Percentage
<10	14	7.0%
11-20	33	16.5%
21-30	55	27.5%
31-40	39	19.5%
41-50	29	14.5%
51-60	22	11.0%
61 and above	8	4.0%
Education status	No. of	Percentage
Illiterate	50	25%
Primary	33	16.5%
Matric	90	45%
Graduation	19	9.5%
Post Graduate	4	2.0%
Professionals	4	2.0%
Area of Residence	No. of cases	Percentage
Rural	105	52.5%
Urban	95	47.5%

Table-1: Demographic Variables associated with Road Traffic Accidents

Time of Accident	Number of cases	Percentage
Before noon 6.00 am to 2.00pm	58	29.0%
After noon 2.00 pm to 10.00pm	124	62.0%
During night 10.00pm - 6.00 am	18	9.0%
Total	200	100%

Table-2: Time of the day of Occurrence of Accident

Type of person	Number of cases	Percentage
Driver	101	50.5%
Passenger	59	29.5%
Pedestrian	40	20.0%
Type of vehicle		
Two - wheeler	116	58.0%
Three - wheeler	5	2.5%
Four - wheeler	68	34.0%
Other	11	5.5%

Table-3: Type of persons and vehicles involved in Road Traffic Accidents

Factors in person	Number of cases	Percentage
Untrained drivers	14	7.0%
Intoxicated	47	23.5%
Medical Illness	7	3.5%
Fatigue	30	15%
Stress	34	17%
Factors in Vehicle		
Rash driving	48	24.0%
Not well maintained	37	18.5%
Defects in vehicles	19	9.5%

Table-4: Shows Factors in person and vehicles contributing to Road Traffic Accidents

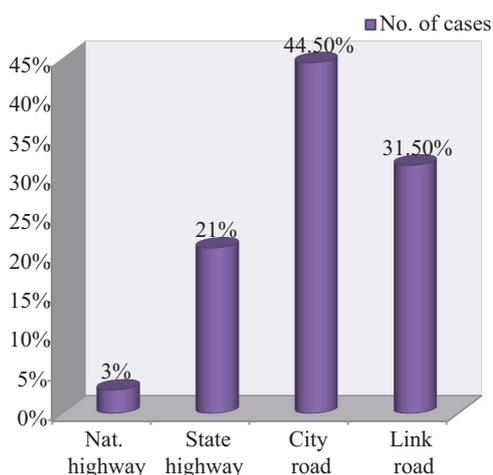


Figure-1: Type of roads involved in RTA's

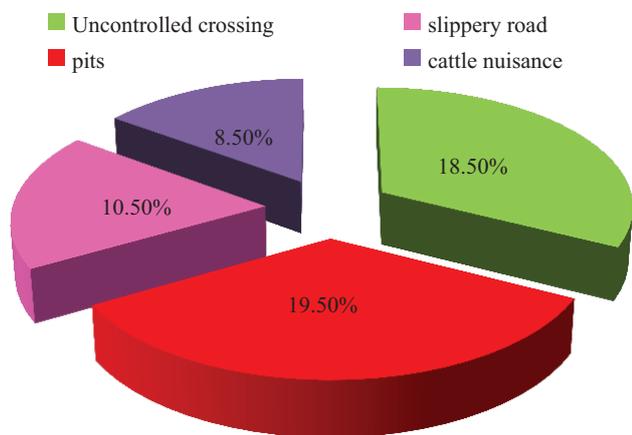


Figure-2: Factors on roads

compared to females and these findings are in consonance with our study as males were more involved in outdoor activities.⁵ Verma PK et al (2004) in a study conducted in Delhi found that majority of the accident victims belonged to rural area.⁶ This pattern is also similar to our study as figures of the year 2011 reveal that 68.8% of population resides in rural India.

Majority of the cases of RTA's i.e 173 (86.5%) had received no education or were educated just up to matric. These are synonymous with findings of a study carried out by Manna N et al (2012) in Kolkattathat relatively poorly educated individuals were more likely to get into traffic accidents can be due to less awareness about the traffic rules and safety measures.⁷

In the present study majority of the Road Traffic Accidents (62.0%) occurred between 2 pm to 10 pm. These are similar to study conducted by Patel DJ e al (2010) in Chattisgarh.⁸ The current study observed that majority (58%)of the vehicles involved were two - wheelers followed by 68 (34.0%) four wheelers. These findings are consistent with other studies which found that majority of the victims were Two-wheeler users 46.3% (315) and pedestrians 24.9% (169), followed by cycle users (14.1%).⁹

The present study found that majority of the affected victims 23.5 % were intoxicated with alcohol, 17 % were having mental stress and 15 % were fatigued. This is supported by findings of Jha N et al and Patil SS.^{4,10} Manna N et al (2012)in a study conducted in Kolkatta showed that 6.8% had mental anxiety during the time of accidents and impulsive risk taking behavior

in 5.8% individuals. Studies in Maharashtra, and Nepal had found RTAs more frequent among drivers and passengers.^{10,11} These findings are consistent with the current study in which maximum number of persons 101 (50.5%) involved in road traffic accidents were drivers and 59 (29.5%) were passengers.

Conclusion- The study observed that majority of the victims of Road Traffic Accidents were young males leading to loss of productive age group which will adversely affect economy of our country. The prevention of road accidents is also tremendously vital and should be ensured by implementation of strict laws, by intervention of technical and police controls, by providing training to drivers, mainly those involved in the transport of dangerous substances and, if required, by applying legal and administrative penalties, implemented laws should be maintained.

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Retropleural Drainage: Yes or No in Primary Repair of Esophageal Atresia with Tracheoesophageal Fistula

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ABSTRACT

Introduction: It has been noted that Retropleural drainage causes major complications in Esophageal Atresia (EA) with Tracheoesophageal Fistula (TEF). So the study was done to evaluate the role of retropleural drainage in all cases of EA with TEF with primary repair in terms of preventing complications and survival.

Material and methods: In our prospective study of 96 patients with age ranging from hours to 13 days with M: F 1.66:1 and weight ranging from 1.34 kg to 4.05 kg in between February 2008 to february2016, babies were randomly allocated to two Groups. Group A with retropleural drainage (n=69) and Group B without retropleural drainage (n=27). The two Groups were comparable in respect to age of the patients, weight, respiratory status and distance between the pouches after mobilization

Results: Major leak occurred in 7 cases associated with pneumothorax in 3 cases in Group A and 1 case in Group B despite the presence of retro pleural drain, all needed secondary intercostal tube drainage. Minor leak occurred in 3 cases of Group A and 1 case in Group B was managed with secondary drainage and conservative management.

Conclusion: Retropleural drainage is not necessary, following wide and tension free primary repair through extrapleural approach of EA with TEF because it does not appear to prevent pneumothorax and collection of saliva and pus after anastomotic leak which require placement of additional drain for proper drainage followed by revision surgery in major leak group. It acts a potential for infection because it acts as a foreign body leading to more exudates formation and causes postoperative pain leading to poor respiratory efforts because it impinges between the neurovascular bundles.

Keywords: Retropleural drainage, Esophageal atresia, Tracheoesophageal fistula, Anastomotic leak

INTRODUCTION

Thomas Gibson is credited with the first description of esophageal atresia with tracheoesophageal fistula in 1697,¹ it took more than two hundred years for the first two patients to survive a multiple-staged surgeries by Ladd² and Leven.³ In 1943, Haight and Towsley⁴ reported the first survivor following a primary definitive repair. Recently, significant advances have been made in the management of esophageal atresia.^{5,6} This has resulted in a progressive decrease in mortality as a result of early diagnosis and improved neonatal intensive care and anesthesia. At present in the developed countries the presence of associated major congenital anomalies determines survival,⁷ this is not true in developing countries, where many other factors continue to contribute to the high mortality.^{8,9} It is a routine practice to keep the drain adjacent to the anastomosis to identify and treat any postoperative leak from the anastomotic site after primary repair.^{10,11} But this is now becoming less important because

of the improved survival of EA and TEF cases and lower postoperative complications^{12,13} and a leak is not as devastating as with an extra pleural approach.^{11,14} So this prospective study was conducted to evaluate the role of retropleural drainage in all cases of EA with TEF with primary repair in terms of preventing complications and survival.

MATERIAL AND METHODS

After taking informed consent of patients parents and ethical clearance from IRB, ninety six out of 117 neonates who underwent primary surgery for EA with TEF (figures 1-3) in the Department Of Pediatric Surgery at Career institute of medical sciences and hospital and various pediatric hospitals in Lucknow, India from February 2008 to february 2016 were included in the study. For confirming the diagnosis and preoperative assessment of gap was with Plain X-ray neck, chest and abdomen (PA and lateral view) with No. 8 Fr Red Rubber catheter). Actual measurement of gap was done intraoperatively and we classified patients according to gap length also. Waterston classification was used of survival. Our surgical technique included the right extrapleural approach with U type fistula ligation with adequate upper pouch mobilization followed by a single layer anastomosis with vicryl 5-0 with or without retropleural drainage. The babies were randomly allocated to two Groups, Group A with retropleural drainage (n=69) and Group B without retropleural drainage (n=27). The two Groups were comparable in respect to age of the patients, weight, respiratory status and distance between the pouches after mobilization. Both Groups received the same pre and post operative treatment. The incidence of anastomotic leak (incidence, diagnosis, and treatment), respiratory complications and management of complications were noted in two groups.

STATISTICAL ANALYSIS

Statistical analysis was done using the descriptive statistics. SPSS version 21 was used to make tables.

RESULTS

Sixty babies (62.5%) were males and 36 (37.5%) females.

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Figure-1: Operated case of EA with TEF without retropleural drainage.



Figure-2: Operated case of EA with TEF with retropleural drainage and on ventilator because of anastomotic tension.



Figure-3: Contrast esophagogram after 7th day of primary repair with retropleural drainage.

72 (75%) were full term and 24 (25%) preterm. The weight ranged from 1.34 kg to 4.05 kg with a median weight of 2.50 kg. Associated congenital anomalies were present in 25 (26%) patients. History of attempted feeding was present in 51 (53%). Respiratory distress was found in 84 (87%) of the babies. Short gap <1cm (<1 vertebral body) in 54 cases (54%), intermediate gap 1-3 cm (1-3 vertebral bodies) 35 (36%) and long gap >3 cm (>3 vertebral bodies) were present in 7 (9%) of cases. In group A 28 (29%) patients, 49 (51%) were in group B and 19 (20%) were in group C. In group A major leak occurred in 7 cases in which 3 cases were associated with pneumothorax despite the presence of retro pleural drainage all needed secondary intercostal tube drainage (table-1). Minor leak was present in 3 cases. In group B major anastomotic leak with pneumothorax occurred in 1 patient and minor leak was present in one case which was diagnosed clinically and confirmed by chest radiograph and contrast esophagogram intercostal drain was put. All patients with minor leak were managed with drainage and conservative management. In our study 7 (7 %) cases were expired in early postoperative period (within 48 hrs of surgery) either because of life threatening congenital anomalies or anesthetic complication and aspiration so they are not including in surgical related mortality. Seven patients who had major leak associated with pneumonitis or septicemia were expired whether they have retropleural drain or not. The survival rate was 78 % in Group A and 85% in group B.

DISCUSSION

In the present study in Group A anastomotic leaks after primary repair were detected either by observing the saliva in retropleural drain or by contrast study of esophagus. Minor leaks were identified by appearance of frothy saliva in the retropleural drain with no accompanying deterioration in the general condition. An alternative method to confirm this was by giving oral methylene blue and then observing its appearance in the retropleural drain. Major leaks were clinically suspected by the contents draining with accompanying deterioration in general condition of the patient due to mediastinitis or pneumonitis and septicemia. In group B leaks were clinically suspected by increased respiratory distress, fever and sepsis or plain X-ray chest showing pneumothorax and pneumonitis and confirmed by contrast study of esophagus. Routine retro pleural drain placed near the anastomosis may not be necessary in all cases of EA with TEF after primary repair and good prognosis patients (Waterston class A and B) who undergo an uncomplicated extra pleural repair without undue tension do not appear to benefit from having a chest drain in place, and there is potential for complications.¹⁵ Factors that contribute to anastomotic leaks include; excess tension at the site of anastomosis inadequate approximation of mucosa, too tightly tied sutures, trauma and Ischemia of esophageal ends during mobilization, and the use of silk sutures for esophageal anastomosis.¹²⁻¹⁶ Anastomotic leaks were frequent and often fatal in the past.¹⁷ Now with improved surgical technique and neonatal care, including nutritional and ventilatory support if anastomosis is under tension because of long gap or associated severe pneumonitis this complication is seen less frequently and leads to death.^{12,13,18} With the use of an extra pleural approach the consequences of a leak are diminished even further.¹⁴ Major leaks, usually detected within

	Major Leak ± Pneumo-thorax	Minor Leak	Mortality related to operative complications
Group A	7 ± 3	3	6
Group B	1 ± 1	1	1

Table-1: Incidence of Major and Minor leak, Pneumothorax and related mortality in both Groups

the first 48 hours require re-exploration in most cases, but these account for only a small percentage of all leaks. In our study Amongst the 7 major leak patients 2 patients had leak on day two of surgery despite of no tension at the anastomotic site with proper esophageal anastomosis, on exploration drain was found at the anastomotic site seemed to be associated drain related injury in which revision anastomosis was done. Placement of a drain close to the anastomosis was a standard part of operation for EA with TEF in earlier operative textbooks and reviews.¹⁰⁻¹⁸ However newer texts acknowledge that a retropleural drain may not be necessary in all cases of EA with TEF after primary definitive repair and its use should be left to the discretion of the pediatric surgeons.^{10,12,16,19} A retropleural drain does not always function when there is an anastomotic leak may be because of blockage due to excessive exudates. Further a retro pleural chest drain acts as a potential for infection because it acts as a foreign body leads to more exudates formation and local pleural irritation causing pleural thickening and reaction and may lead to postoperative pain because it impinges between the intercostal neurovascular bundle and delayed scoliosis. So we recommended that a retro pleural drain is not necessary in every case of EA with TEF after primary repair when the distance is less than 3 cm (intermediate gap) between the upper and lower esophageal pouch. Gangopadhyay et al²⁰ also recommended that retropleural drainage is not necessary in all cases of EA and TEF especially when the distance between the two esophageal pouches is within 2.5 cm. When a wide and tension free esophago-esophageal anastomosis has been performed in a single layer using absorbable suture by a retropleural approach, there is no need of putting a chest drain, to avoid drain associated complications Routine use of retro pleural following primary repair of EA with TEF does not appear to prevent pneumothorax and collection of saliva and pus after anastomotic leak which require placement of additional drain for proper drainage for minor leak and if there is major leak we should go for revision surgery as early as possible either in the form of repeat primary repair or palliative procedures like cervical esophagostomy and abdominoesophagostomy or gastrostomy and feeding jejunostomy, because it is associated with high mortality rate. Definitive procedure for esophageal replacement may be done later in life. So patients of EA and TEF with good prognostic factor after primary definitive repair can be safely managed by without retro pleural drain.

CONCLUSION

Retropleural drainage is not necessary in primary repair of EA with TEF with an extrapleural approach because it does not prevent surgical related complications and acts a potential for infection and causes postoperative pain leading to poor respiratory efforts because it impinges between the neurovascular bundles.

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Associated Congenital Anomalies with Esophageal Atresia and their Impact on Survival in an Indian Scenario

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ABSTRACT

Introduction: Congenital anomalies associated with the esophageal atresia may also lead to mortality and morbidity. Study was aimed to find out the role of associated congenital anomalies in the survival of Esophageal atresia in an Indian tertiary health centre.

Material and methods: In a prospective study from february 2008 to february 2016, 127 neonates with EA were admitted with age ranging from hours to 13 days. Diagnosis of associated congenital anomaly was done on the basis of physical examination and supported with investigations. Waterston prognostic criteria were used for survival.

Results: Associated congenital anomalies were present in 46 (36%) patients with VACTERL association in 6 (5%) cases. The survival was 49% in patients with associated anomalies and was 78% ($p < 0.001$) in patients free from any other congenital anomalies.

Conclusion: In developing countries delayed diagnosis of congenital anomalies, poor transport facilities and delayed referral and lack of advanced neonatological setup leads to increased morbidity and mortality.

Keywords: Congenital Anomalies, Esophageal Atresia

INTRODUCTION

Esophageal atresia is a common congenital disorder, its incidence ranging between 1/4000 to 1/5000. EA and TEF are life-threatening malformations of generally undefined cause. Previous reports of familial cases suggest a genetic contribution. The pattern of inheritance appears non-Mendelian, i.e., multifactorial. Individuals with EA/TEF often have other malformations and medical problems. EA results from the unsuccessful separation of the primitive foregut in to the ventral respiratory and dorsal digestive tract; this process is usually completed by the eight week of gestation. Associated congenital anomalies are present in nearly 50% of cases of EA^{1,2} and responsible for morbidity and mortality. Recent improvements in surgical, neonatal care and safe anesthesia have remarkably improved the survival rate in the absence of associated anomalies. Study was done with the aim to know the role of associated congenital anomalies in the survival of Esophageal atresia in an Indian tertiary health centre.

MATERIAL AND METHODS

From February 2008 to february 2016 a total number of 127 neonates were admitted with the diagnosis of EA (inform consent was taken from the patients parents and clearance from ethical committee). Preoperative assessment of gap was done with Plain X-ray chest (PA and lateral view) with No. 8 Fr Red Rubber catheter. Diagnosis of associated congenital anomaly was done on the basis of careful systemic and local

examination, radiological and sonological examination. Data collected included age at the time of admission, gestational age, birth weight, sex, home delivery /hospital delivery, associated congenital anomalies, respiratory status, and their impact on survival. Waterston prognostic criteria were used for survival. We defined a survival as an infant who leaves hospital able to take feeds well. The standard approach to EA was directed toward primary repair in all cases whenever possible except in cases of long gap, very low general condition or associated major gastrointestinal anomalies. Primary repair was done with retropleural approach with or without Azygos ligation, retropleural drainage and transanastomotic stenting.

STATISTICAL ANALYSIS

Chi-square test and student's t- test was done for statistical analysis with the help of SPSS version 21.

RESULTS

In our study of 127 cases of EA (figure-1), only 46 (36%) were admitted within 24 hours and 47 (37%) were admitted after 48hours with the most delayed admission was at age 13 days. 84 (66%) were males and 43 (34%) were females. 88 (69%) were full terms and 39 (31%) preterm. Weight ranged from 1.34 kg to 4.05 kg with a median weight of 2.50 kg. 60 (47%) were having weight >2.5 kg. Hospital based deliveries were in 66 (52%). Only 12 (9%) were having no respiratory distress at the time of admission, 44 (35%) were having mild, 58 (46%) having moderate and 13 (10%) were having severe respiratory distress. EA with distal TEF were the commonest type, 117 (92%) of cases, pure EA in 9 (7%) of cases and only one case of EA with proximal and distal fistula was present in the study. Associated congenital anomalies were present in 46 (36%) patients as given in table no 1. VACTERL association was present in 6 cases as given in table-2. The commonest associated anomaly was congenital heart disease (based upon preoperative clinical evaluation + post-operative echo-cardiogram) found in 17 (13%) cases.

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Rt aortic arch was present in 4 (3%) cases detected at the time of thoracotomy. Amongst 88 survived cases ECHO was done at the time of discharge. Six cases had congenital heart disease (VSD in 3 cases, ASD+VSD, PDA and Tetralogy of Fallot in one case each). The survival rate in EA was low (49 %) as compared to those free from any other congenital anomaly (78%) Survival rate among the cases of EA with congenital heart disease was 33% (p<0.001). EA with GI anomalies had mortality in 4 cases out of 39 (10%). Amongst VACTERL association no patient could survive either pre-operatively or post-operatively. Survival as per Waterston criteria was 100% in group A, 83% in group B and 22% in group C.

DISCUSSION

EA is reported to be associated with cardiovascular^{3,4} gastrointestinal,⁵ vertebral,⁶ costal,⁷ and urogenital anomalies.⁸ The VACTERL association has been related to a high risk of mortality in patients with EA,⁹ suggesting that the severity of the phenotypic presentation contributes to a significantly worst outcome. The development of EA and associated anomalies seems to be related to the malformation and ectopic location of the notochord. Many teratogenic events induce a global decrease in the proliferation of precursor cells in the perinotochordal mesenchyme. The resultant paucity of mesenchyme between the neural tube and the foregut impairs the formation and /or positioning of the tracheal-esophageal septation. A teratogenic insult may occur at a time critical for foregut separation from the notochord, disturbing the areas that ordinarily undergo rapid proliferation. For example, vertebral and cloacal differentiations are directed by notochord inductive signals, which could account for the vertebral and anal anomalies. In our series that 46/127 (36%) cases of EA had other anomalies. In the series by Hasab et al⁹ 60% cases of EA had associated anomaly. Spitz et al¹¹ reported 47%. Saing H et al¹² and Rokitansky et al² reported 59% and 52.4% associated congenital malformations.

The reason of low incidence of associated anomalies in our series was that those patients of EA who were born with low birth weight and from remote areas where deliveries are conducted at home did not survived long enough to reach tertiary referral centre. Early gestational age and lower birth weights were significantly correlated with higher rate of malformation. The survival rate in EA with associated congenital anomalies is only 49% as compared to Isolated EA (78%). This shows that association of other congenital anomalies plays a major role in survival of patients of EA in India ($\chi^2 = 19.497$; p<0.001). In our series no patient survived with VACTERL association because of lack of advanced neonatological backup. Saing H et al¹² reported that the association of two or more system anomalies and the severity of associated anomalies influence mortality in esophageal atresia. Survival rate in our series of EA with congenital heart disease is 33% while in series of Ein et al¹³ 64% of neonates of esophageal atresia with congenital heart disease survived. Congenital heart disease is the most common malformation associated with EA.^{1,14,15} Survival in patients with EA and normal heart is excellent; this reflects advances in surgery and neonatal care of previously high risk groups such as low birth weight infants and infants with cardiac problems.¹⁶ High prevalence of congenital heart disease is an indication for screening. Antenatal Detection of EA should prompt referral for

Associated anomaly	Number of cases	Percentage
Vertebral and Nervous system	8	6.3
Spinal anomalies (hemivertebra, scoliosis, vertebral fusion)	6	4.72
Lumbosacral anomalies	1	0.79
Hydrocephalus	1	0.79
Gastrointestinal system	15	11.81
High ARM	10	7.87
Low ARM	2	1.57
Duodenal atresia	2	1.57
Annular pancreas	1	0.79
Cardiac	17	13.39
Congenital heart disease	17	13.39
Musculoskeletal anomalies	6	4.72
Limb anomalies	4	3.15
Polydactyly	1	0.79
CTEV	2	1.57
Rt. Radial hypoplasia	1	0.79
Rib anomalies (13 th rib)	3	2.36
Head and Neck	2	1.57
Cleft lip	1	0.79
Genitourinary system	2	1.57
Hypospadias	2	1.57
Respiratory system	2	1.57
Pulmonary hypoplasia	1	0.79
Tracheomalacia	1	0.79

Table-1: Association of other congenital anomalies in patients of esophageal atresia

Multiple anomalies (VACTERL Association)	Number of cases	%
Duodenal atresia + Anorectal malformation	1	0.79
Duodenal atresia + Anorectal malformation + Congenital heart disease	1	0.79
Rib anomalies + Pulmonary hypoplasia	1	0.79
Congenital heart disease + Hypospadias	1	0.79
Congenital heart disease + Meningomyelo-coele	1	0.79
Cardiac disease + Rt. radial hypoplasia	1	0.79

Table-2: Associated multiple anomalies with EA



Figure-1: Right radial hypoplasia associated with Esophageal Atresia.

detail fetal cardiac scanning. If there is no antenatal diagnosis, timing of post natal screening for cardiac disease (whether it should be performed urgently before surgery) is debatable and there are different recommendations about this.^{17,18} Therefore, if the baby is acyanotic with no sign of cardiac disease, we agree with Spitz et al¹⁷ that a preoperative cardiac evaluation is not mandatory and can be deferred until after EA repair. The level of the associated anorectal malformation was not associated with the type of esophageal atresia.

In our study EA with GI anomalies, GI anomalies were responsible for mortality in 4 cases out of 39 (10 %). while in series of Andrassy et al.¹⁹ GI anomalies were responsible for mortality in 5/15 (33 %). In our series the associated urogenital anomalies are less it means there is some environmental or hereditary factor responsible for this. According to van Heurn LW et al²⁰ the European patients had a significantly higher incidence of urogenital (UG) anomalies as compared to the Asian population (26% vs. 4%), agenesis in 4 and dysplasia in 3 cases of one or both kidneys. Hereditary factors may influence the incidence of associated anomalies in patients of EA particularly of the UG system. Presence of rib,⁷ vertebral⁶ and limb anomalies do not affect the survival directly but they are usually associated with long gap so associated with morbidity and mortality related with surgical complication (anastomotic leak) as in our study the survival is good in short gap as compared to long gap atresia (91%vs53%). In developed countries the approach for treating EA with associated congenital anomalies is quite different because of advancement in neonatological setup and paying power is not a problem but in developing countries the scenario is different, advanced neonatological backup is limited and most of the patients are from low socioeconomic status, lack of awareness regarding health insurance and treatment facility (expenses in investigation and medication) is not provided by the government.

CONCLUSION

So we conclude associated anomalies are the leading cause for morbidity and mortality and Waterston prognostic criteria is good for evaluation for prognosis. Presence and severity of other anomalies does not influence the basic approach to treatment of the EA.

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Approach to Hyperbilirubinemia in Near Term Infants

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ABSTRACT

Introduction: Hyperbilirubinemia is one of the most common clinical sign encountered in newborns which if untreated is potentially neurotoxic. There is a need for early prediction of jaundice to spot those babies at risk and intervene. Study aimed to determine the predictive value of cord and serum bilirubin 24 hours after birth to identify near term new born babies at risk of developing significant hyperbilirubinemia and identify the other clinical risk factors for significant hyperbilirubinemia which would determine their predictive values.

Material and methods: A cross sectional prospective hospital based follow up study involving consecutive near term neonates. We have studied 180 healthy term neonates, over a period of 5 month, with mean birth weight ranging from 2.0 to 2.5 kg. The cord and 24 hour bilirubin was measured in all babies and 5th day bilirubin measured in only jaundice babies.

Results: Incidence of significant jaundice in our study was 12.2%. The difference of mean cord and 24 hours serum bilirubin in jaundiced and Non jaundiced babies was statistically extremely significant [P<0.001] There was an excellent correlation between mean values of cord bilirubin, 24th hour TSB and day 5 TSB (p < 0.001). Mean cord and 24th hour TSB Level were high in male babies, babies born by SVD, babies born to multigravida mother, to mother with antenatal complications, babies with h/o jaundice in sibling, with cephalhematoma, with mother received oxytocin, maternal blood group 'O' and babies with Non 'O' blood group.

Conclusion: Our results indicate that 24th hour TSB \leq 6.2 mg/dl will predict babies who are unlikely to develop significant hyperbilirubinemia subsequently. Use of cord bilirubin value, 24th hour serum bilirubin value and clinical risk factor will be of benefit in our country with limited resources and follow up facilities.

Keywords: Hyperbilirubinemia, near term infants, cord bilirubin

INTRODUCTION

Hyperbilirubinemia is one of the most common clinical sign encountered in newborns and in most cases a benign problem. If untreated, severe unconjugated hyperbilirubinemia is potentially neurotoxic.¹ Neonatal jaundice is seen in two thirds of entirely healthy term newborn¹ and in a greater proportion of preterm's (80%),¹ in the first week of life. The non physiological or pathological hyperbilirubinemia in 5-10% of healthy term newborn^{1,2} is the most common reason for readmission of neonates in the first week of life in the current era of early postnatal discharge from the hospital.³⁻⁵

6.1% of term newborn, who were otherwise normal have a maximal serum bilirubin over 12.9 mg/dl⁵ and it is an alarming fact that serum bilirubin level were over 15 mg/dl found in 3% of healthy babies. Role of bilirubin in newborn has been an enigma because of its dual role as a potent natural antioxidant and at the same time having a cytotoxic effect for producing bilirubin induced neurological dysfunction. As there is no cut off value of bilirubin level that can cause bilirubin encephalopathy, neonatal jaundice has become a serious cause of concern for both

parents and pediatrician as well.¹ Thus every jaundiced baby necessitates attention at the earliest to look for the feature of pathological jaundice. After the reports of kernicterus occurring in healthy newborns even without hemolysis, have come to the forefront, there has been an increased apprehension with regard to Jaundice.⁶

In a cohort of 500 healthy term neonates, Alpay et al found that hyperbilirubinemia has occurred only after 72 hours of age.⁷ Also American academy of Pediatrics recommends that neonates discharged within 48 hours should have a follow up visit after 2-3 days to detect significant jaundice and other problems.⁸ However, this is a difficult proposition as many babies discharged early may not come for a review. Hence, the concept of early prediction of jaundice offers an attractive option to spot those babies at risk and intervene.

The dire need for early prediction of significant jaundice and the paucity of such studies from India acted as an impetus to undertake the present study- "hyperbilirubinemia in nearterm infants". This study could make a significant contribution to the neonatal care especially it being the first of its kind in South India, and one of the few studies undertaken in India. Study was aimed to determine the predictive value of cord bilirubin and serum bilirubin 24 hours after birth to identify near term new born babies at risk of developing significant hyperbilirubinemia and to identify the other clinical risk factors for significant hyperbilirubinemia that would determine their predictive values.

MATERIAL AND METHODS

A cross sectional prospective hospital based follow up study involving consecutive near term neonates over 5 months was done after taking the hospital ethics committee approval and informed patients consent.

Inclusion criteria

1. Near term newborn babies born at Shadan Hospital a tertiary Hospital "from 34- 37 weeks of gestation.
2. Babies weighing from 2.0 to 2.5 kgs

Exclusion criteria

1. Babies requiring admission to NICU for various neonatal complications.
2. Infants of diabetic mother
3. Neonates with major congenital malformations
4. Newborn babies born to HIV positive and HBs Ag positive mothers
5. Newborn born to RH - mother

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A total of 180 babies were enrolled in to study based on inclusion exclusion criteria. Gestational age of each baby was attested with the aid of LMP, EDD and antenatal ultra sound dating and it was confirmed by using new Ballard's score. Cord blood was collected soon after the delivery and analyzed by spectrophotometer model number 106 by spectral method. For all 180 babies blood sampling was done at 24 hours +/- six hours post natal age for estimation of total serum bilirubin (TSB) levels. TSB levels were estimated by spectrophotometry by spectral method. The effect of haemolysis was eliminated by subtracting the 450 nm absorbance from 454 nm and thus only bilirubin absorbance is measured. This is suitable for neonates less than 2-3 weeks only. All babies were followed on day 5 for the evidence of neonatal jaundice. Day 5 serum bilirubin was estimated for those icteric babies, who had yellowish discoloration extending below the knees. Babies with icterus up to the palms and soles with TSB < 15 mg/dl were kept under photo therapy and exchanged transfusion was done as per guidelines. Babies with significant jaundice on day 5 were further investigated with hemoglobin percentage, peripheral blood smear, reticulocyte count and direct coombs test.

STATISTICAL ANALYSIS

Statistical test like ANOVA, Mann-Whitney U test along with descriptive statistics were used to infer results. All the analysis was done with the help of SPSS version 21.

RESULTS

Demographic parameters of all the babies

Our study included 180 newborn babies, born at near term gestation, weighting from 2.0 to 2.5 kg, with mean birth weight. The sex ratio was Male: Female = 51.7%/48.3% (n=93/87) = 1.07: 1. The demographic parameter of jaundiced babies showed that out of 180 babies 22 babies developed significant jaundice on day 5 (Incidents 12.20%). The mean birth weight of these jaundiced babies was ranging from 2.0 - 2.5 kg. The mean times of 24th hours TSB estimation was 25.56 hours +/- 1.539 hours ranging from 22 to 30 hours and mean 24 hours TSB levels were 6.89 mg/dl +/- 1.25 mg/dl ranging from 4 to 9 mg/dl. The mean day 5 TSB level were 16.9 mg/dl +/- 1.61 mg/dl ranging from 13 to 19 mg/dl. There was no co relation between 24th hour TSB and day 5 TSB, $r = -0.199$ and $p = 0.375$.

Distribution of jaundiced babies according to sex

Male to female sex ratio among jaundiced baby was 2.6:1 (16/6). Males were 2.6 times more than female among jaundice babies. There is an association between male sex and presence of jaundice with $\chi^2 = 4.46$ and $P = 0.035$ which is statistically significant.

Distribution of jaundiced babies according to mode of delivery

Babies born by SVD had higher incidents of neonatal jaundice. Of the jaundiced babies 12 had SVD, 4 LSCS, and 6 EmLSCS. All 100% of babies received vitamin K (n=22).

Distribution of jaundiced babies according to cephalhematoma

50% of jaundice newborns had cephalhematoma (n=11). An association was present between presence of cephalhematoma and presence of jaundice with $P > 0.01$, which is statistically significant.

Distribution of jaundice according to parity

Of the jaundiced babies 15 were born to multigravida and 7 to primigravida.

Distribution of jaundiced babies according to antenatal complications

More numbers of babies with jaundice were born to mothers having PROM > 12Hours (n=6) PIH in 3 and 13 had nil complications. PIH was there in 53 of the non jaundiced and none of latter had PROM.

Comparison of demographic parameters in babies with and without jaundice (table 1)

And higher number of jaundiced babies were born by NVD, Multigravida mother and mother who has received L.A but it was not statistically significant.

Among the jaundiced babies mean Hb % was 13 gm% ranging from 12 gm% to 14 gm%, mean reticulocyte count was 3% ranging from 2-4 %. out of 22 babies DCT was done in all babies and no babies had positive DCT.

Comparison of mothers and babies blood groups among jaundiced and non-jaundiced babies

Babies (n=19) (86.4%) with jaundice where born to mother with O blood group and ABO incompatibility was present in n=12 (63.2%) babies.

OA incompatibility was present in n=2 (10.5%) babies and OB incompatibility was present in n=10 (52.6%) of babies. Rest of the babies didn't have any incompatibility and had various combination of blood group. When number is < 5 in the cell then "Fisher's Exact Test" was done.

Mother with O blood group and babies with Non O blood group has P value of <0.05 which is statistically significant and baby is at high risk of developing significant jaundice.

Mean 24th hour tsb and cord tsb among jaundiced and non jaundiced

Among Jaundiced babies (n=22), the mean cord TSB = 2.1 mg/dl, with a SD = +/- 0.06 mg/dl and mean 24th hour TSB = 6.9 mg/dl, SD = +/- 0.27 mg/dl. Among Non Jaundiced babies (n=158) the mean cord TSB = 1.3 mg/dl, SD = +/- 0.02 mg/dl and mean 24th hour TSB = 4.7 mg/dl, SD = +/- 0.04 mg/dl. The mean cord TSB and mean 24th Hour TSB was high in jaundiced babies compared to Non-Jaundiced babies.

Correlation between the mean 24th hour TSB levels and clinical risk factors

Mean 24th hour TSB levels vs sex of the newborn: Mean 24th hour TSB levels were high in male babies compared to female babies but it is statistically not significant.

Mean 24th hour TSB levels vs gravid mean 24th hours TSB levels were high in babies born to Multigravida mother and the difference was statistically significant by non parametric mann-whitney test.

Mean 24th hour TSB vs jaundice in sibling: Mean 24th hour TSB levels were high in babies with history of jaundice in sibling and it was statistically significant with $p < 0.001$ in jaundice babies (n=16) it was 6.70(SD 1.40) and in non jaundice (n=164) it was 4.80(SD0.70)

Mean 24th hour TSB levels vs cephalhematoma: Mean 24th hour TSB levels in jaundice (n=18) was 6.1(SD 1.53) and in non jaundice babies (n=162) it was 4.9(SD 0.77).

Sr no.	Parameter	Jaundiced n=22	Non Jaundiced n=158	P Value
1.	Sex	Male=72.7% (n=16) Female=27.3% (n=6)	Male=48.7% (n=77) Female=51.3% (n=81)	<0.05
2.	Mean birth weight	2.89 kgs +/- 0.213 kgs	2.85 kgs +/- 0.80 kgs	
3.	Mode of delivery			NS
	SVD	n=12 (54.5%)	n=72 (45.6%)	
	LSCS	n=4 (18.2%)	n=63 (39.9%)	
	EmLSCS	n=6 (27.3%)	n=20 (12.7%)	
	Forcep	n=0 (0%)	n=3 (1.9%)	
4.	Gravida			0.25 (NS)
	Primi	n=7 (31.8%)	n=73 (46.2%)	
	Multi	n=15 (68.2%)	n=85 (53.8%)	
5.	Anenatal complication			<0.0001 (S)
	PIH	n=3 (13.6%)	n=53 (33.5%)	
	PROM	n=6 (27.3%)	n=0 (0%)	
	NONE	n=13 (59.1%)	n=105 (66.5%)	
6.	Jaundice in sibling	n=12 (54.5%)	n=4 (2.5 %)	----
7.	Vit -k	n=22 (100%)	n=158 (100%)	<0.001 (S)
8.	Cephalhemato-ma	n=11(50%)	n= 7(4.4%)	

Table-1: Comparison of Demographic parameters in babies with and without jaundice

Mean 24th hour TSB levels were high in babies having Cephalhematoma and it was statistically significant.

Mean 24th hour TSB levels vs mothers blood group: The Mean 24th hour TSB levels in babies born to mother having 'O' blood group (n=97) was 5.30(SD 1.05) and in non "O" group was 4.60(SD 0.63). Mean 24th hour TSB levels were high in babies born to mother having 'O' blood group which was statistically significant (p<0.001)

Mean 24th hour TSB vs baby blood group: The Mean 24th hour TSB levels in babies with 'O' blood group (n=78) was 5.00(SD 0.61) and in Non "O" group (n=102) was 4.98 (SD 1.13). Mean 24th hour TSB levels were high in babies with 'O' blood group but it was not statistically significant (0.77)

All babies with mother having 'O' blood group compared with baby's blood group

Babies with 'O' group (n=78) had mean 24th hour TSB (mg/dl) of 5.10 (SD 0.61) and in Non 'O' group (n=19) it was 6.60 (SD 1.51) and was statistically significant (p<0.001). So mother with 'O' blood group and baby with Non 'O' blood group has higher mean 24th hour TSB value which was statistically significant and such babies are at high risk of developing significant jaundice. So mean 24th hour TSB levels were high in babies born to Multi gravid mother, babies with history of jaundice in sibling, babies with cephalhematoma, babies with mother having 'O' blood group and babies with Non 'O' blood group; which was statistically significant.

And mean 24th hour TSB levels were high in Male child, Babies born by SVD and mother who has received Oxytocin but it was statistically not significant.

Mean cord bilirubin vs sex of the newborn

Mean cord bilirubin levels in male babies (n=93) was 1.50 (SD 0.37) and in female babies (n=87) was 1.30(SD 0.40) which was statistically significant. Mean cord bilirubin levels were high in male babies which is statistically significant (<0.001).

Mean cord bilirubin levels vs mode of delivery.

Mean cord bilirubin levels in babies born by SVD (n=84) was 1.50 (SD 0.38) and Em.LSCS (n=26) was 1.70 (SD0.29) Mean cord bilirubin levels were high in babies born by SVD and

Em.LSCS which was statistically significant (p<0.001)

Mean cord bilirubin levels vs gravid

Mean cord bilirubin levels in babies delivered by Multi gravida mother (n=100) was 1.44(SD 0.430) and in Primi (n=80) was 1.38(SD 0.345). Mean cord bilirubin levels were high in babies delivered by Multi gravida mother but it was statistically not significant.

Mean cord bilirubin levels were high in babies with mother having PROM>12 hour and it was statistically significant. These could be explained by increased perinatal stress in these babies (Table 2).

Mean cord bilirubin levels vs jaundice in sibling

Mean cord bilirubin levels in babies with history of jaundice in sibling (n= 16) was 1.94(SD 0.408) and in non jaundice babies (n=164) was 1.36 (SD 0.355). Mean cord bilirubin levels were high in babies with history of jaundice in sibling and it was statistically significant (p<0.001).

Mean cord bilirubin levels vs baby blood group

Mean cord bilirubin levels were high in babies with Non 'O' blood group but it was statistically not significant (0.171).

All babies with mother having 'O' blood group are compared with baby blood group

Mean cord bilirubin levels in babies having Non 'O' blood group (n=19) was 1.87(SD0.417) and in 'O' group (n=78) was 1.37(SD0.379). Mean cord bilirubin levels were high in babies having Non 'O' blood group and mother having 'O' blood group which was statistically significant (p<0.001) So mean cord bilirubin values were high in Male babies, babies delivered by NVD and Em. LSCS, babies with mother having PROM>12 hours, babies with H/O jaundice in sibling, babies whose mother has received intrapartum Oxytocin, babies with mother having 'O' blood group and baby having Non 'O' blood group and it was statistically significant. And mean cord bilirubin values were high in babies delivered by multi gravida mother but it was statistically not significant.

Since samples were tested at 3 different time points (at birth, at 24th hour and at 5th day) repeated measures of ANOVA was

performed to know whether there exist any significant difference between the mean values of bilirubin (Table 3).

DISCUSSION

Early discharges of the near term newborns from the hospital after delivery has recently become a common practice for medical, social, and economic reasons. However it has shown that newborns whose post delivery hospital stay is ≤ 72 hours are at a significantly greater risk of readmission then those whose stay is > 72 hours.^{4,7,23} Hyperbilirubinemia is the most commonly reported cause for the readmission during early neonatal period,^{4,7,11,10} and 0.36% of healthy term newborns discharged after 72 hours of life with mild hyperbilirubinemia may even develop subsequent moderate to severe hyperbilirubinemia.¹¹ In United States there were 22 reported cases of kernicterus developing in babies discharged within 48 hours after birth.¹⁶⁻²⁰ Furthermore the safety of relying on follow up visits after early discharge is questionable as 10 % of the population fails to return for a follow up visit.^{12,13}

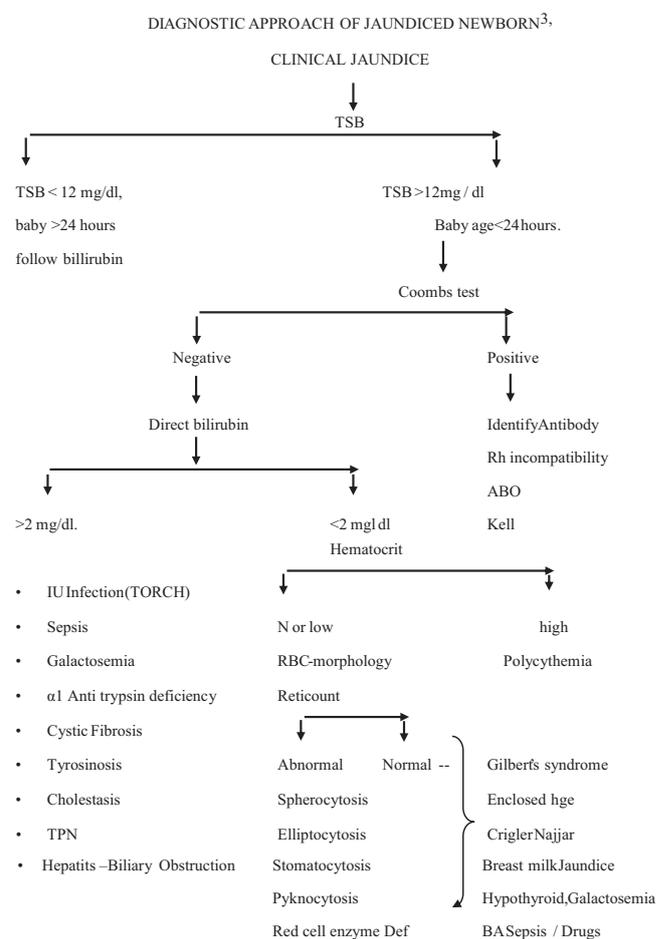
Hence it is crucial to categorize the babies who are at risk for significant jaundice to prevent the potential bilirubin neurotoxicity. The desperate need for early prediction of significant jaundice and paucity of such studies from India has spurred us to undertake this prospective follow up study.

Studies available from the west and north India have used either cord bilirubin or 24th hour total serum bilirubin for prediction of significant hyperbilirubinemia (Table-4). We have designed this study to determine the predictive values of cord bilirubin, 24th hour serum bilirubin and clinical risk factors to identify the newborns at risk of significant hyperbilirubinemia.

Incident of Jaundice: We have found the incident of significant jaundice to be around 12.2 % which was comparable with other studies from India.¹⁴⁻¹⁶ and USA.¹ We have studied the impact of

barriers epidemiological factors over the incidents of significant jaundice. Males were 2.6% more jaundiced than females in our studies. Similar association was demonstrated by Friedman et al, Maisels et al and Anand et al.^{16,15}

Our study has shown that male sex, spontaneous vaginal delivery (due to increased perinatal stress) multigravida, oxytocin induction, cephalhematoma, history of jaundice in the sibling were associated with increased incident of jaundice. Also we could demonstrate the statistically significant association between male sex, spontaneous vaginal delivery, history of jaundice in sibling, cephalhematoma, use of oxytocin, history of PROM in mother, mother with “O” blood group and baby with non “O” blood group has significant jaundice. Khoury et al demonstrated the impact of jaundice in sibling over the present child. He has shown that present child has three times more risk of jaundice if the previous child had TSB > 12 mg/dl and the risk is 12.5 times if the sibling had TSB more than 15 mg/dl We have found that 63.2% (n=12) of the jaundiced babies had ABO incompatibility out of which 10.5% (n=2) had OA incompatibility and 52.6% (n=10) had OB incompatibility. In



ANC	N	Mean cord TSB (mg/dl)	SD	P value.
PIH	56	1.32	0.343	0.001
PROM>12hr	6	2.08	0.264	
Nil	118	1.42	0.393	
Total	180	1.41	0.40	

Table-2: Mean cord bilirubin levels vs antenatal complications.

Time Point	Mean	SD	P Value
Cord bilirubin	2.10	0.28	<0.001 (S)
24 th hour bilirubin	6.90	1.25	
5 th day bilirubin	16.90	1.61	

So there is a significant difference between all 3 mean values at 3 different time points with $P < 0.001$ [n=22], which is statistically significant.

Table-3: Mean values of bilirubin at 3 different time points

Name of study	No. Of babies	Def. Of significant Jaundice	Time of sampling on Day-1	24 th hour TSB cut off	Sensitivity	Specificity	PPV	NPV
Our study	180	TSB>15 mg/dl	24+/- 6 hours	≥ 6.2 mg/dl	94%	96.4%	92.3%	99.25%
Alpay etal ⁷	498	TSB>17 mg/dl	24 hours	≥ 6 mg/dl	90%	-	-	97.9%
Avasthi etal ²²	274	TSB>15 mg/dl	18-24 hours	> 3.99 mg/dl	67%	67%	-	-
Aggrawal etal ²³	220	TSB>17 mg/dl	24+/- 6 hours	< 6 mg/dl	95%	70.6%	27.7%	99.3%

Table-4: Comparison of our study with previous studies

western studies OA incompatibility is more common than OB incompatibility. As “B” blood group is second most common blood group in India after “O” blood group we can explain the higher incident of OB incompatibility in our set up.

Our study aimed to predict significant hyperbilirubimemia using Cord bilirubin and 24 hour serum bilirubin. We have co related these values with clinical risk factors. We have established that cord bilirubin cut off value ≥ 1.95 mg/dl and 24th hour total serum bilirubin cut off value ≥ 6.2 mg/dl has good predictive value for identifying newborns at risk of jaundice with:

Area under curve = 95.00%, Sensitivity = 94.00%, Specificity = 96.40%, Positive predictive value = 92.30%, Negative predictive value = 99.25%, False positive rate = 1.50% and P value < 0.0001 .

Rosenfeld et al¹⁶ uses cord bilirubin > 2 mg/dl for predicting significant hyperbilirubimemia. Also Knudsen et al found that cord bilirubin level > 2.3 mg/dl was associated with increased risk of jaundice¹⁷

Our study confirmed that mean cord bilirubin levels and 24th hour TSB Level were higher in male babies, babies born by SVD, babies born to multigravida mother, babies born to mother with antenatal complications, babies with H/O jaundice in sibling, babies with cephalhematoma, babies with mother who has received oxytocin, maternal blood group ‘O’ and babies with Non ‘O’ blood group, and these were statistically significant. Indicating a good correlation between cord bilirubin, 24th hour TSB and clinical risk factor.

There was an excellent correlation between mean values of cord bilirubin, 24th hour TSB and day 5 TSB with $p < 0.001$ which is statistically highly significant [Repeated measures of ANOVA] (Table 3).

To summarize we have shown that it is possible to predict significant hyperbilirubinemia using cord bilirubin, 24th hour serum bilirubin and clinical risk factor.

Limitations of our study

Total serum bilirubin level estimation was not done in all babies on day 5 as they were not having clinically significant jaundice and it was though unethical to collect a sample from such babies. We followed babies only up to day 5, so some of the late causes of jaundice might have been missed and they are likely to be very small in number and it is not of a real concern

CONCLUSION

our results indicate that 24th hour TSB ≤ 6.2 mg/dl will predict babies who are unlikely to develop significant hyperbilirubinemia subsequently. Use of cord bilirubin value, 24th hour serum bilirubin value and clinical risk factor will be of benefit in our country with limited resources and follow up facilities. Infant at low risk for hyperbilirubinemia can be discharged early at 24 hours of life.

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A Study of Colonoscopic Findings in Cirrhotic Patients with Portal Hypertension

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ABSTRACT

Introduction: It has been noticed that persons with cirrhosis have great amount of colonic lesions. So study was planned to study the spectrum and frequency of colonic lesions in patients with portal hypertension due to cirrhosis, to assess whether the presence of portal hypertension related colonic lesions correlates with CTP and MELD scores and to study the association between upper GI findings of portal hypertension such as esophageal varices, gastric varices, portal hypertensive gastropathy and colonic lesions.

Material and Methods: This cross sectional study was performed for a period of one year. In this study, 100 patients with cirrhosis of liver and 50 age and sex matched controls were enrolled if they met the inclusion criteria.

Results: Portal hypertension related colonic lesions were noted in 59% of patients. Prevalence of portal hypertension related colonic lesions increased with worsening liver function as ascertained by higher CTP and MELD scores. Presence of esophageal varices and prior history of endoscopic variceal ligation correlated with occurrence of rectal varices. There was no association between ascites, splenomegaly, gastric varices, portal hypertensive gastropathy and the presence of colonic lesions. Serum bilirubin and prothrombin time were significantly higher in patients with portal hypertension related colonic lesions. Low serum albumin and decreasing platelet count correlated with presence and frequency of portal hypertension related colonic lesions.

Conclusion: Cirrhotic patients with portal hypertension have significantly higher frequency of colonic lesions as compared to controls. The frequency of portal hypertension related colonic lesions increases with worsening CTP and MELD scores.

Keywords: Cirrhosis, Portal hypertension, Child-turcotte-Pugh score

hypertension also produces vascular changes throughout the colon. The portal hypertension related changes in the colon include portal hypertensive colopathy (PHC), colorectal varices and haemorrhoids.^{3,4} Portal hypertensive colopathy (PHC) is characterized by erythema of the colonic mucosa, vascular lesions including cherry-red spots, arterial spider like lesions or angiodysplasia-like lesions.⁵ The prevalence for PHC ranges from 25 to 70%. Bleeding from PHC is estimated to be upto 9%. There is no universally accepted classification system for grading the severity of mucosal abnormalities in patients with PHC. Rectal varices are described as dilated veins that originate more than 4 cm above the anal verge, not contiguous with the anal columns and do not prolapse into the proctoscope. The prevalence of rectal varices ranges from 7% to 44% in various studies and the bleeding from the varices is seen in upto 8%. Similarly prevalence of haemorrhoids in cirrhotic patients range from 22 to 89%. This makes comparisons between studies challenging. Although colorectal lesions are a source of acute and chronic bleeding, they have received little attention in the literature. Also the variability of the results of previous studies does not allow us to define with any certainty the prevalence of these lesions. These discrepancies between various studies may be because of imprecise terminology, lack of uniform endoscopic descriptions, inter-observer variability. Portal hypertension related colonic lesions has been reported to be associated with a lower platelet count,⁶ an increasing severity of cirrhosis (Child grade), large esophageal varices, gastric varices, higher portal pressure. Colonoscopy readily identifies the portal hypertension related colonic lesions. It is generally considered safe in cirrhotic patients and doesn't worsen the clinical state. Some previous studies suggest that colonoscopic examination is needed in these patients, especially those with worsening Child-Pugh class and decreasing platelet count, to prevent complications, such as lower gastrointestinal bleeding.

MATERIAL AND METHODS

This cross sectional study was performed from December 2013 to November 2015 at Department of Gastroenterology, Osmania General Hospital. This study was approved by the ethical committee of the hospital. All patients with cirrhosis evaluated in the Department of Gastroenterology were enrolled in this study if they met the inclusion criteria. Informed consent was

INTRODUCTION

Cirrhosis, a final pathway for a wide variety of chronic liver diseases, is 14th most common cause of death worldwide.¹ The clinical course of patients with cirrhosis is often complicated by a number of complications that are independent of the etiology of the underlying liver disease. These include portal hypertension and its consequences including variceal bleed, ascites, hepatic encephalopathy, hepatorenal syndrome, hepatopulmonary syndrome, portopulmonary hypertension; cirrhotic cardiomyopathy, hepatic osteodystrophy, endocrine dysfunction and hepatocellular carcinoma. Portal hypertension is defined as the elevation of hepatic venous pressure gradient (HVPG) above 5mmHg. Portal hypertension and its complications are the leading causes of death and liver transplantation, in patients with cirrhosis.² Portal hypertension causes hemodynamic and mucosal changes in the entire gastrointestinal (GI) tract. The various portal hypertension related lesions in the upper GI tract include gastroesophageal varices, portal hypertensive gastropathy, gastric antral vascular ectasia. These have been studied extensively. Similarly portal

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taken from all the subjects.

Inclusion criteria: Patients with cirrhosis of liver, age >18 years.

Exclusion Criteria: Age <18 years, patients with hepatic encephalopathy, very sick patients (shock, inotropic support, ARDS, ventilatory support).

The diagnosis of cirrhosis with portal hypertension was based on characteristic findings including physical stigmata of cirrhosis, liver function tests, prothrombin time, ultrasonographic findings (like nodular liver surface, coarse echotexture of liver parenchyma, splenomegaly etc), upper gastrointestinal endoscopy findings (varices and portal hypertensive gastropathy).

100 patients with cirrhosis of liver were included in the study. Detailed medical history was taken from all patients and they underwent complete physical examination, standard laboratory tests including complete blood picture, biochemical tests of liver and kidney function, serum electrolytes, ultrasound of the abdomen and ascitic fluid analysis, upper GI endoscopy. Special investigations such as Serum ceruloplasmin, 24 Hour urinary copper, Serum copper, Serum Ig G, ANA, SMA, anti-LKM1, Serum α_1 -anti trypsin levels, Transferrin saturation, Serum Ferritin, Serum Iron Anti- mitochondrial antibody (AMA) when required. For assessment of severity, cirrhotic patients were divided into A, B and C classes according to Child Pugh criteria. They were also divided into 4 MELD groups (as per UNOS) as follows: Group 1 – MELD \leq 10, Group 2 – MELD- 11-18, Group 3- 19-24, Group 4- MELD >24.

All patients with ascites were classified according to international ascites club as follows Group 1 – Mild, Group 2 -Moderate, Group 3- Severe. In upper G I endoscopy oesophageal varices were classified into three grades namely Grade I-Varices may be small and straight. Grade II-Tortuous and occupying less than one third of the esophageal lumen Grade III-Large and occupying more than one third of the esophageal lumen Colonoscopy was done using Olympus CV-150 series colonoscope (Olympus corporation, Tokyo, Japan). Conscious sedation with midazolam or propofol was provided when requested. The following lesions were identified in cirrhotic patients with portal hypertension: Portal hypertensive colopathy: characterized by erythema of the colonic mucosa with or without mosaic pattern, vascular lesions including cherry-red spots (flat or slightly elevated red lesion less than 10 mm in diameter), arterial spider like lesions (central arteriole with radiating vessels which blanches on pressure from biopsy forceps), or angiodysplasia-like lesions. Rectal varices were defined as dilated vessels noted 4cms above the anal verge and which do not prolapse into proctoscope. Haemorrhoids: internal or external.

A group of 50 age and sex matched persons undergoing colonoscopy for irritable bowel syndrome were taken as controls. They also underwent complete physical examination, standard laboratory tests including complete blood picture, biochemical tests of liver and kidney function, serum electrolytes, ultrasound of the abdomen, upper GI endoscopy.

RESULTS

In this study, 100 patients with cirrhosis of liver and 50 age and sex matched controls were included.

In the present study it was observed that the mean age of cases was 44.2 years compared to 45.6 years in controls. There was no statistically significant difference in the mean age between cases and controls. Among the cases 81% were male and 19% were female. Among the controls 78% were male and 22% were female. There was no statistically significant difference in distribution of patients based on gender between cases and controls.

Association with all the clinical findings with severity of Child Pugh class are significant ie P-value <0.05 only, association between rectal varices and severity of Child Pugh class is insignificant(P->0.05)

Age group in years	Cases		Controls	
	Number	%	number	%
20-30 yrs	9	9	5	10
31-40 yrs	29	29	14	28
41-50 yrs	36	36	12	24
51-60 yrs	19	19	14	28
61-70 yrs	7	7	5	10
Mean \pm SD	44.2 \pm 10.4		45.6 \pm 11.6	
t-value	0.771			
p value	value p value = 0.442			
Sex				
Females	19	19	11	22
Males	81	81	39	78
Chi square 0.188, p value 0.665				

Table-1: Distribution of patients based on Age

Findings	Present	Absent	P-value
Association between PHC and severity of Child Pugh class			
Class –A	2	16	0.03
Class-B	11	26	
Class-C	20	25	
Association between rectal varices and severity of Child Pugh class			
Class –A	0	18	0.204
Class-B	4	33	
Class-C	7	38	
Association between hemorrhoids and severity of Child Pugh class			
Class –A	3	15	0.002
Class-B	16	21	
Class-C	29	16	
Association between PHC and MELD score			
<10	0	18	<0.001
11 – 18	19	43	
19 – 24	9	5	
>24	5	1	
Association between rectal varices and severity of MELD score			
<10	0	18	<0.001
11 – 18	2	60	
19 – 24	7	7	
>24	2	4	
Association between hemorrhoids and severity of MELD score			
<10	2	16	<0.001
11 – 18	31	31	
19 – 24	11	3	
>24	4	2	

Table-2: Association of findings in present study

Findings	Present	Absent	P-value
Association between PHC and Endoscopic variceal Ligation			
Present	15	25	0.43
Absent	18	42	
Association between rectal varices and endoscopic variceal ligation			
Present	8	32	0.014
Absent	3	57	
Association between hemorrhoids and endoscopic variceal ligation			
Present	19	21	0.93
Absent	29	31	
Association between PHC and gastric varices			
Present	9	14	0.47
Absent	24	53	
Association between rectal varices and gastric varices			
Present	4	19	0.264
Absent	7	70	
Association between hemorrhoids and gastric varices			
Present	13	10	0.351
Absent	35	42	
Association between PHC and portal hypertensive gastropathy			
Present	22	45	0.96
Absent	11	22	
Association between rectal varices and portal hypertensive gastropathy			
Present	8	59	0.66
Absent	3	30	
Association between hemorrhoids and portal hypertensive gastropathy			
Present	28	39	0.076
Absent	20	13	

Table-3: Association between clinical finding and gastric findings

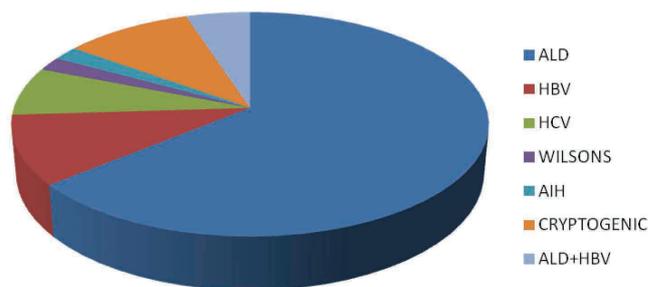


Figure-1: Distribution of cases based on etiology

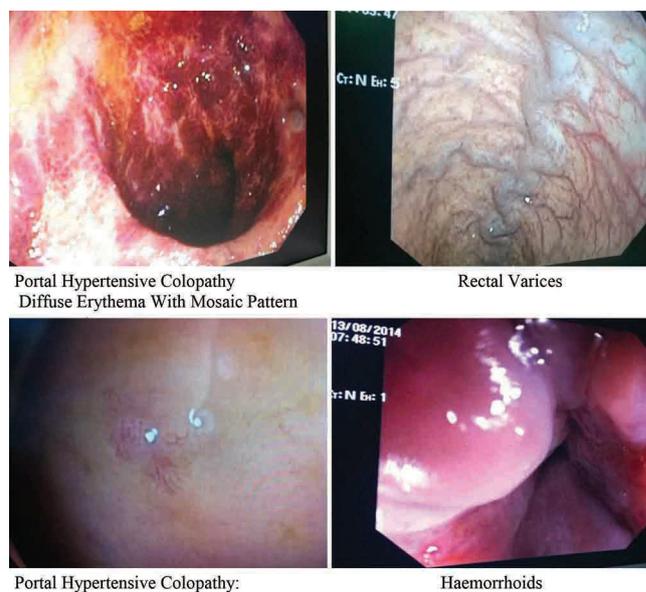


Figure-2: Colonoscopic pictures in the study.

DISCUSSION

Cirrhosis, at present is considered as a dynamic and potentially reversible disease. It consists of two stages, compensated and decompensated cirrhosis, each with a distinct prognosis and different predictors of survival. The development of portal hypertension is a hallmark in the history of cirrhosis, and its progression parallels that of the disease.

It is generally considered safe in cirrhotic patients and doesn't worsen the clinical state.

In the present study, the mean age of patients was 44.2 years compared to 45.6 years in controls. There was no significant difference in the mean age between cases and controls. Among the cirrhotics included in the study 36% belonged to the age group of 41 – 50 years, 29% belonged to the age group of 31 – 40 years. Among the controls 28% belonged to the age group of 51-60 years and 31-40 years each, 24% belonged to the age group 41-50 years. Of the 100 patients of cirrhosis included in the study 81% were male and 19% were female. Among the controls 78% were male and 22% were female. There was no statistically significant difference in distribution of patients based on gender between cases and controls. The most common cause of cirrhosis in the present study was alcoholic liver disease, seen in 64 % of cases followed by hepatitis B infection in 10% of the cases, Hepatitis C infection in 7%, alcohol with co-existent hepatitis B infection in 5%, Wilsons disease in 2%, autoimmune hepatitis in 2% and the cause could not be

determined in 10% of the cases. In the study by Diaz-Sanchez et.al, the main cause of cirrhosis was alcohol consumption (45.5%) followed by hepatitis C virus infection (31.8%). In the study by Ito et.al, the main cause of liver cirrhosis was post-viral hepatitis (68%) related to hepatitis B (6%) or C (62%) infection. For the cirrhotic patients included in the study, child-turcotte-pugh(CTP) was calculated and the patients were divided into Child-pugh class A,B,C. In the present study 18% of patients belonged to class A, 37% belonged to class B and 45% to class C. The patients were also categorised based on MELD score into 4 groups. In the present study it was observed that 62 % of cases had a MELD score between 11 – 18 followed by, 18 % cases had a MELD score of < 10, 14% had score between 19 – 24 and 6 % above 24.

Among the cases included in the present study, colonoscopy was abnormal i.e. revealed one or more of the portal hypertension related lesions (portal hypertensive colopathy, rectal varices and haemorrhoids) in a total of 59% patients. Of these 25% patients had portal hypertensive colopathy with haemorrhoids, 19% patients had only haemorrhoids, 5% had rectal varices with haemorrhoids, 5% had portal hypertensive colopathy only, 3% had rectal varices with haemorrhoids, 3% had only rectal varices. Among controls 18(36%) had abnormal findings on colonoscopy. On comparing the frequency of abnormal colonoscopy findings between cases and controls, the cirrhosis had statistically significant (p= 0.007) higher frequency of abnormal findings on colonoscopy. Also haemorrhoids were found in 48% of cases as

compared to 22% of controls, which was statistically significant ($p=0.002$). In the present study portal hypertensive colopathy (PHC) was seen in 33% of the cases. This is similar to the studies by Ghoshal UC et al,⁷ Bini EJ et al,⁸ who reported a frequency of 36.6% and 38% respectively. However there is wide variation in the reported frequency of PHC in different studies. In studies by Diaz-sanchez A et al,⁹ Weismuller TJ et al,¹⁰ PHC was seen 23.9% and 24.3% of cases respectively which is lower than the present study. Zaman A et al,¹¹ reported a prevalence as low as 3%, whereas Salama ZA et al,¹² Jeong IB et al,¹³ Bresci et al,¹⁴ Ito K et al¹⁶ reported prevalences of 45.7%, 45.8%, 54%, 66% respectively which is higher than the present study. This wide variation in the prevalence of PHC may be due to lack of lack of a clear classification system, lack of consensus on the endoscopic appearance of PHC and interobserver variability. Rectal varices were found in 11% of cases. This in accordance with reported prevalence of 14.3% by Salama ZA et al¹² and 12% by Ito K et al.⁶

In the studies by Diaz-Sanchez et al⁹ and Zaman A et al¹¹ rectal varices were seen in 7.6% and 7%. However, Ghoshal UC et al,⁷ Misra SP¹⁵ et.al reported higher rates, 31.7% and 40% respectively. Also haemorrhoids were seen in 48% of the cases in present study, similar to the study by Diaz-Sanchez et al,⁹ who reported haemorrhoids in 52.3%. There is statistically significant (p value=0.002) difference in the frequency of haemorrhoids between cases and controls with higher frequency among cases. However Jeong IB et al,¹³ Ghoshal UC et al,⁷ Zaman A et al¹¹ reported lower rates, 25%, 21.9%, 21% respectively. This discrepancy may be attributed to lack of clear grading system, different aetiologies of liver disease and variation in severity of liver disease of the cases included. Bleeding per rectum was noted in 12% of cases in the present study, of which 3% presented with severe bleeding requiring blood transfusion. All the patients who presented with severe bleeding per rectum had rectal varices. Also majority of the presenting with bleeding per rectum had haemorrhoids. In the previous studies, Bresci et al,¹⁴ reported a lower GI bleeding rate of 6%. Salama ZA et al,¹² reported a bleeding rate of 20%, mostly from haemorrhoids. Ghoshal UC et al¹⁴ reported that detection of colorectal varices but not PHC was associated with haematochezia. In the study by Ganguly S et al,¹⁶ overt bleeding per rectum was seen in 4% of patients with colopathy and 8% of the patients with rectal varices. In the study by Ito K et.al, the primary indications for colonoscopy were faecal occult blood test positive in 34% and anaemia in 10%. This lower incidence of bleeding from rectal varices may be related to rectal varices having thicker walls and are less superficial than those in the lower esophagus.⁴

Cirrhosis is characterized by the presence of extensive fibrosis and numerous regenerative nodules replacing the normal liver parenchyma. The mechanism of portal hypertension in cirrhosis is increased intrahepatic resistance due to fibrosis with concomitant increase in portal flow due to haemodynamic changes such as splanchnic vasodilatation. With advanced liver disease there is worsening of fibrosis and haemodynamic dysfunction leading to higher portal pressure.

In the present study, of the 33 patients with portal hypertensive colopathy, 61% were from Child-Pugh class C, 33% from Child-Pugh class B and 6% from Child -Pugh class A. On analysis there is a statistically significant ($p=0.03$) relation

between the severity of liver disease and presence of PHC. Also 63.6% of the cases with rectal varices were from Child-Pugh class C, 36.4% from Child-Pugh class B and none of the cases from Child-Pugh class A had rectal varices. Of the cases with haemorrhoids, 60.4% were from Child-Pugh class C, 33.6% from Child-pugh class B and 6.2% were from Child-Pugh class A. The relation between presence of haemorrhoids and severity of liver disease was statistically significant (p value=0.002). Similarly Ito et al,⁶ demonstrated that the prevalence of portal hypertensive colopathy increased with worsening Child Pugh class. Gad YZ et.al and Salama ZA et al,¹⁸ also demonstrated increase in the prevalence of portal hypertension related colonic lesions with increasing severity of liver disease. The increase in the prevalence of portal hypertension related colonic lesions with advanced Child-Pugh class may be a result of increase in portal pressure due to increasing fibrosis coupled with worsening haemodynamic dysfunction associated with advanced liver disease. Higher portal pressure as measured by HVPG has been reported to correlate with the presence of portal hypertensive colopathy.⁹ MELD score is the most accepted prognostic scoring system for allocation of organs for liver transplantation. It accurately predicts survival in patients in with decompensated cirrhosis. When the cases with PHC were categorised based on MELD score, 15.2 % of cases with portal hypertensive colopathy had MELD score > 24 compared to 1.5 % in patients with no portal hypertensive colopathy. There was statistically significant relation between presence of portal hypertensive colopathy and increasing MELD score. $p < 0.001$. Also, 18.2 % of cases with rectal varices had MELD score > 24 compared to 4.5 % in patients with no rectal varices. The association between rectal varices and increasing MELD score was statistically significant ($p < 0.001$). Of the patients with haemorrhoids, 8.3 % had MELD score > 24 compared to 3.8 % in patients with no haemorrhoids. There was high statistical significance between presence of hemorrhoids and MELD score. $p=0.001$. This relation between portal hypertension related colonic lesions and MELD score may be explained by worsening of fibrosis leading to increase in portal pressure and worsening haemodynamic dysfunction associated with high MELD score suggestive of advanced liver disease. Similarly Jeong IB et al¹³ demonstrated a statistically significant correlation between the prevalence of PHC and increasing MELD score.

Ascites is the most common complication of cirrhosis, and 60% of patients with compensated cirrhosis develop ascites within 10 years during the course of their disease. Ascites develops when the HVPG increases more than 12mm of Hg and when it is more than 16mm of Hg, ascites becomes refractory. When the presence of portal hypertension associated colonic lesions was compared with severity of ascites statistically significant relation was not demonstrated in the present study ($p>0.05$). Similarly Ito et al,¹⁶ Diaz-sanchez et al⁹ and Ghoshal et al⁷ also reported no relation between the presence and severity of ascites with occurrence of portal hypertension related colonic lesions. Splenomegaly is present in 50% of cirrhotics with portal hypertension. In the present study splenomegaly was noted in 54.5% of the cases with PHC, 72.7% of those with rectal varices and 56.2% of those with haemorrhoids. On comparing with the cases who did not have portal hypertension related colonic lesions, there was no statistically significant ($p>0.05$) relation

between the presence of splenomegaly and portal hypertension related colonic lesions. Similarly Ito et al¹⁶ did not find any correlation between the presence of splenomegaly and portal hypertension related colonic lesions. Esophageal varices are the most common site for the formation of portosystemic collaterals in cirrhotic patients with portal hypertension.

In the present study when the association between the presence of PHC and grade of esophageal varices was evaluated, there was no statistically ($p=0.07$) significant relation. Similarly when the association between presence of haemorrhoids and esophageal varices was analysed, it was found that there was no statistically significant relation ($p=0.35$). This finding is in accordance with the previous studies. Diaz-Sanchez et al,⁹ Ito K et al,⁶ Ghoshal UC et al,⁷ found no association between the presence of PHC and esophageal varices. In the present study it was observed that 54.5 % patients with rectal varices had grade III esophageal varices compared to 21.3 % patients without rectal varices. There was a statistical significance between presence of rectal varices and esophageal varices ($p=0.03$). Hosking et al¹⁸ noted rectal varices in 19% of patients with cirrhosis without esophageal varices, 39% in patients with esophageal varices without history of bleeding, and 59% in patients with esophageal varices and history of bleeding. Similarly Gad YZ et al¹⁷ demonstrated a significant relation between the presence of esophageal varices and rectal varices. Varices do not develop until a minimal threshold HVPG of 10mmHg is reached. Rectal varices are collaterals between superior rectal veins which drain into the inferior mesenteric system and the middle inferior rectal veins which drain into the iliac veins and are one of the most common site for ectopic varices.

The presence of portal hypertension related colonic lesions has been reported to correlate with portal pressure. In patients with a prior history of endoscopic variceal ligation for esophageal varices, PHC was noted in 45.5%. There was no statistically significant relation between prior history of EVL and occurrence of PHC. Also, in the cases with haemorrhoids prior history of endoscopic variceal ligation was noted in 39.6%. Similarly Jeong Ib et al¹³ noted no significant relation between prior history of EVL and presence of PHC or haemorrhoids. In the present study, it was observed that among the 11 patients with rectal varices 72.7 % had prior history of endoscopic variceal ligation compared to 36% patients without rectal varices. There was a statistical significance between presence of rectal varices and prior history of esophageal variceal ligation ($p=0.019$). This finding is similar to the study by GadYZ et al.¹⁷ A large study conducted in Japan by Watanabe et.al reported that 95% of patients with rectal varices had a history of esophageal varices and 87% of these patients had previously undergone endoscopic variceal obliteration for esophageal varices. The indication for endoscopic band ligation of esophageal varices are large varices(>5mm) and variceal haemorrhage. Variceal haemorrhage occurs only when hepatic venous pressure gradient is more than 12mm of Hg. The mechanism of formation of rectal varices after treatment of esophageal varices is thought to be the result of obliteration of supplying vessels such as the left gastric, posterior gastric and short gastric veins leading to development of collateral vessels of the inferior mesenteric venous system and thus the formation of rectal varices.

In the present study there is no statistically significant relation

between the presence of gastric varices and any of the portal hypertension related colonic lesions (PHC, rectal varices and haemorrhoids), $p>0.05$. Similarly, the studies by Ghoshal UC et al,⁷ Diaz-Sanchez et al,⁹ Salama ZA et al¹² noted no association between gastric varices and portal hypertension related colonic lesions. Portal hypertensive gastropathy was noted in 66.7% of the cases with PHC, 72.7% of those with rectal varices and 58.3% of those with haemorrhoids. On analysis there was no statistically significant association between portal hypertensive gastropathy and portal hypertension related colonic lesions (p value>0.05). this finding is in accordance with studies by Ito et al⁶ and Diaz-Sanchez et al.⁹

The mean serum bilirubin of cases with portal hypertension related lesions was 2.9 ± 1.5 mg/dl and for the cases with no portal hypertension related colonic lesions it was 1.59 ± 0.62 mg/dl. On comparing the means between the two groups, serum bilirubin was significantly higher in the cases who had portal hypertension related colonic lesions (p value<0.001). Serum bilirubin is a component of both CTP score and MELD score. Development of jaundice is considered as a sign of decompensation in cirrhosis. Decompensation is negligible in patients with compensated cirrhosis with an HVPG < 10 mm Hg, whereas it reaches 40% at 4 years in patients with an HVPG 10 mmHg.

The mean prothrombin time in cases with portal hypertension related colonic lesions was 18.89 ± 3.12 sec and for the cases with no portal hypertension related colonic lesions it was 16.5 ± 2.03 sec. On analysis, prothrombin cases with portal hypertension related colonic lesions had higher prothrombin time (p value <0.001). Prothrombin time is a measure of hepatic synthetic function. Prothrombin time with INR is a component of both CTP and MELD scores. High values of bilirubin and prothrombin time are associated with high CTP and MELD scores suggestive of advanced liver disease. As discussed above advanced liver disease is associated with increased frequency of portal hypertension related colonic lesions due to higher portal pressures and worsening haemodynamic dysfunction. Serum albumin is a test of synthetic function of liver. It is a component of child-turcotte-pugh score. Lower levels of serum albumin are associated with advanced liver disease. The mean value of serum albumin among patients with portal hypertension related colonic lesions was 2.57 ± 0.53 g/dl compared to a mean albumin value of 2.85 ± 0.56 g/dl among patients without portal hypertension related colonic lesions. On statistical analysis serum albumin was significantly lower in the cases who had portal hypertension related colonic lesions (p value=0.012). Thrombocytopenia (platelet count <150,000/microL) is a common complication in patients with cirrhosis. It has been observed in up to 76% of patients.¹⁹ Declining platelet count may be one of the earliest signs of portal hypertension in cirrhosis. The degree of thrombocytopenia has been shown to be a useful prognostic marker in cirrhotic patients. Possible causes of thrombocytopenia in cirrhosis include splenic sequestration of platelets, suppression of platelet production in the bone marrow, and decreased activity of the hematopoietic growth factor thrombopoietin (TPO).²⁰⁻²¹

The mean platelet count among cases with portal hypertension related colonic lesions was $1.12 \pm 0.19 \times 10^5/\mu\text{l}$ and it was $1.5 \pm 0.42 \times 10^5/\mu\text{l}$ in cases without portal hypertension related

colonic lesions. On comparing the means between these two groups, platelet count was significantly lower in the cases with portal hypertension related colonic lesions. Ito et al,⁶ reported that count was related to occurrence of portal hypertensive colopathy. Similarly Gad YZ et al¹⁷ and Jeong IB et al¹³ reported a statistically significant relation between decreased platelet count and portal hypertension related colonic lesions. The relation between platelet count and portal hypertension related colonic lesions may be explained by the association of low platelet count with advanced fibrosis. Advanced fibrosis leads to high portal pressures due to increased intrahepatic resistance. Presence PHC has been demonstrated to correlate with portal pressure.

CONCLUSION

Cirrhotic patients with portal hypertension have significantly higher frequency of colonic lesions as compared to controls. The frequency of portal hypertension related colonic lesions increases with increase in the severity of liver disease as ascertained by Child-turcotte-Pugh score. Portal hypertension related colonic lesions are more frequent in cirrhotic patients with higher MELD score. There is no association between the severity of ascites and the presence of portal hypertension related colonic lesions. Presence of splenomegaly does not correlate with the presence colonic lesions due to portal hypertension. There is a statistically significant correlation between the presence of rectal varices and the size of esophageal varices. Prior history of Endoscopic variceal ligation of esophageal varices is associated with increase in the occurrence of rectal varices. Presence of gastric varices and portal hypertensive gastropathy did not correlated with the presence of portal hypertension related colonic lesions. Serum bilirubin and prothrombin time were significantly more in patients with portal hypertension related colonic lesions. Lower serum albumin and platelet count correlate with presence and frequency of portal hypertension related colonic lesions.

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Observation on Analgesic Efficacy of Intrathecal Clonidine as an Adjuvant to Hyperbaric Bupivacaine in Patients Undergoing Lower Limb Surgeries

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ABSTRACT

Introduction: Postoperative pain relief can improve functionality, reduce physiological and emotional morbidity and improve quality of life. Neuraxial blocks not only reduce the incidence of venous thrombosis, pulmonary embolism, cardiac complications, bleeding transfusion requirements and respiratory depressions but also provide effective postoperative analgesia. With the addition of opioid additives such as clonidine, ketamine, postsurgical analgesic effect of intrathecally administered bupivacaine can be prolonged. Intrathecal administration of clonidine induces antinociceptive effects in humans. Hence, we evaluated the impact of the additive analgesic effects of clonidine with bupivacaine when given intrathecal in lower limb surgeries in a tertiary care hospital and to compare the results with the use of Bupivacaine alone.

Material and Methods: Sixty cases admitted for lower limb surgery were divided into equal groups I and II. Cases in Group I received intrathecal bupivacaine while those in group II received intrathecal combination of bupivacaine and clonidine. Systematic recording and comparison of the results along with the adverse effects of anaesthesia was done.

Results: There was a significantly higher duration of a pain-free period in cases administered with clonidine as an adjuvant to hyperbaric bupivacaine. Conclusion - Addition of clonidine as an adjuvant to hyperbaric bupivacaine for subarachnoid block prolongs the duration of effective anaesthesia and significantly prolongs the duration of analgesia as compared to plain hyperbaric bupivacaine. The utilization of intrathecal clonidine is not associated with respiratory depression, hypotension, bradycardia and pruritus.

Conclusion: Spinal anaesthesia offers advantages of maintaining steady breathing rate and relaxing only desired muscles. At the same time, it is also accompanied by certain adverse effects like shorter duration of action, increase in patient's anxiety etc.

Keywords: Anaesthesia, Analgesia, Bupivacaine, Clonidine, Combination, Intrathecal

INTRODUCTION

Clonidine, an imidazoline, was originally tested as a vasoconstrictor, acting at peripheral α_2 receptors. During clinical trials as a topical nasal decongestant, clonidine was found to cause hypotension, sedation and bradycardia. Dr. August Bier carried out the first spinal anaesthesia in 1899 and his anaesthetic technique has become the standard practice for lower extremity and abdominal surgery worldwide.¹ Nowadays, the most commonly used drugs for spinal anaesthesia are local anaesthetics. However, limited duration of action is the major drawback of single injection administered via spinal route. In clinical practice, a number of adjuvant has been added to intrathecal local anaesthetics for supplementation of

intra-operative anaesthesia and postoperative analgesia.² In 1976, Midazolam was the first water-soluble benzodiazepine (BZP) to be clinically used and was synthesized by Walsar et al. and also was the first BZP that was used in anaesthetic field.^{3,4} Diazepam and midazolam are the frequently used BZP during surgical procedures along with flumazenil, which is commonly employed BZP antagonist. It is due to the 7 member diazepine ring that fuses with the benzene ring in the chemical structure of BZPs, gives BZPs their name. For increasing the pharmacological effect of BZPs, their agonists have a 5-aryl substituent (ring C). Presence of a keto group in the place of ring C and CH₃- group at fourth position in flumazenil differentiates it from BZPs. Therefore, for instantaneous termination of action of BZPs, their antagonist flumazenil can be used.^{5,6} Maintenance of large amount of midazolam in the plasma at a constant rate can be attributed to its lipid-soluble nature.⁷ Older age does not increase the volume of distribution significantly.^{8,9} However, in obese patients, the volume of distribution is increased and the elimination half time is prolonged while the clearance remains unchanged.⁸ Elimination half time is independent of the route of administration. Major operations seem to increase the volume of distribution and prolong the elimination half time.⁹ Extrahepatic locations of the body are also involved in the metabolism of midazolam.¹⁰ Reduction in the clearance of the drug in the plasma and prolongation of clearance half life has been observed in patients with liver disorder in comparison with healthy individuals. However, in such cases, no change has been observed in the volume of distribution of the drug.¹¹ Clonidine is well absorbed after administration and its bioavailability is nearly 100%. There is a good correlation between plasma concentrations of clonidine and its pharmacological effects.¹² The study was aimed to evaluate the impact of the additive analgesic effects of clonidine with bupivacaine when given intrathecal in lower limb surgeries in a tertiary care hospital and to compare the results with the use of Bupivacaine alone

MATERIAL AND METHODS

After prior approval from the Institutional Ethics Committee (IEC), this randomized study was conducted in the Department of Anaesthesiology of Katihar Medical College. All the subjects

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were pre-informed about the study protocol and written consent was taken from them. Sixty adult cases of either sex and between the ages of 20 to 70 years of ASA grade I and II that were admitted in the hospital for lower limb surgeries were included in this study. Data pertaining to age, sex and impending surgery of the patient was documented and each patient was clinically examined. Cases not falling in the age group and cases with diabetes mellitus, hypertension, hypotension, respiratory diseases, cardiac diseases, renal diseases, epilepsy, spinal defects, coagulopathy, increased intracranial tension and sepsis were excluded from the study. Preanaesthetic evaluation was performed. Two groups were formulated with 30 patients in each group giving a total of 60 patients. The groups were I and II. Cases in group I received intrathecal 2.5ml of 0.5% hyperbaric Bupivacaine 12.5mg with 0.4ml of normal saline. Cases in group II received intrathecal 2.5ml of 0.5% hyperbaric Bupivacaine 12.5mg with 0.2ml (30µg) of Clonidine in 0.2 ml normal saline solution. No premedication was administered and spinal block was performed with 25G spinal needle in the L3-L4 intervertebral space in the sitting position. The following parameters were recorded and monitored every two minutes for the first twenty minutes and then every five minutes till the completion of the surgery.

1. Clinical parameters
2. Level of sensory blockade
3. Quality of intraoperative analgesia
4. Motor power
5. Time of two segments regression
6. Side effects

Postoperatively, the cases were monitored within four hours of intrathecal injection or upon complete recovery of the sensory and motor functions whichever of the two was longer. Duration of total analgesia was recorded as the time between onsets of analgesia to that of rescue analgesia. Duration of motor blockade was recorded as the time between onsets to resolution of motor blockade.

STATISTICAL ANALYSIS

All the results were analyzed by SPSS software. Paired ‘t’ was used to assess the level of significance.

RESULTS

Both the groups were comparable to each other in age, weight, gender and type of surgery involved as shown in Table-1 and 2. No significant difference in heart rate and blood pressure was observed. Table 3 and 4 highlights the time required for onset of sensory and motor blockade symptoms (in minutes) respectively. Maximum duration of motor blockade was 150 to 160 minutes for group I patients and was 160 to 170 minutes for group II patients as shown in Table 5. Table 6 shows the level of analgesia which was T₁₀ for group I patients and T₈ for group II patients. The maximum time for two segment sensory regression was 81 to 100 minutes for group I patients and was 120 to 140 minutes for group II patients (Table-7). The maximum duration of analgesia for group I and II patients was 160 to 180 minutes and 220 to 260 minutes respectively as shown in Table-8. Time taken between administration of the drug and onset of motor block was less in Group II. All sixty cases required analgesia during twenty four hours after surgery. However, the total number of oral administrations was significantly less in Group

II. There were no episodes of bradycardia, hypotension, sedation or dizziness in any patients (Table-9). Few patients from each group developed urinary retention and time for the first self voiding was almost similar in both groups. No neurological deficits were detected at discharge.

DISCUSSION

A number of decades have passed since the beginning of clinical use of clonidine. This drug which was originally used as an antihypertensive agent is now used orally, intravenously and even intrathecally. This drug also has intrathecal effects when used as an adjuvant. These beneficial effects have been demonstrated in both adults and children. In recent studies

Age in years	Group I	Group II
21-25	4	2
26-30	2	4
31-35	4	7
36-40	9	6
41-45	5	3
46-50	6	8
Total	30	30

Table-1: Age distribution of participants in this study

Weight in kilograms	Group I	Group II
46-50	0	0
51-55	12	11
56-60	15	13
61-65	2	3
66-70	0	3
71-75	1	0
Total	30	30

Table-2: Weight distribution of participants in this study

Time in minutes	Group I	Group II
3-5	02	14
6-8	20	14
9-11	07	01
12-14	01	01
Total	30	30

Table-3: Duration for onset of sensory blockade in minutes

Time in minutes	Group I	Group II
6-8	00	00
9-11	18	17
12-14	11	12
15-17	01	01
Total	30	30

Table-4: Duration for onset of motor blockade in minutes

Time in minutes	Group I	Group II
111-120	00	00
121-130	01	01
131-140	05	04
141-150	06	05
151-160	09	08
161-170	05	09
171-180	04	03
Total	30	30

Table-5: Duration of motor blockade in minutes

Spinal Level	Group I	Group II
T ₄	00	00
T ₅	00	00
T ₆	00	00
T ₇	04	03
T ₈	09	12
T ₉	06	05
T ₁₀	11	10
Total	30	30

Table-6: Level of analgesia

Time in minutes	Group I	Group II
41-60	02	00
61-80	10	01
81-100	13	01
101-120	03	06
121-140	01	19
141-160	00	02
161-180	01	01
181-200	00	00
Total	30	30

Table-7: Time for two segment sensory regression

Time in minutes	Group I	Group II
121-140	02	00
141-160	08	00
161-180	10	00
181-200	10	02
201-220	00	02
221-240	00	13
241-260	00	13
261-280	00	00
281-300	00	00
Total	30	30

Table-8: Duration of analgesia

Spinal Level	Group I	Group II
Hypotension	01	02
Nausea	02	01
Shivering	02	03
Heavy headedness	02	01
Pruritus	00	00

Table-9: Post-operative side effects

clonidine has been demonstrated to be an effective sedative and analgesic and to reduce the amount of anaesthetic agents required. When compared to clonidine, midazolam exerts its impact by modulating the brain's inhibitory neurotransmitter; \hat{I}^3 - amino butyric acid (GABA). GABA receptors are of two type, out of which BZPs are a component of BZP-GABAA receptor complex.^{12,13} Chloride ions gating gets initiated after the activation of GABAA receptors which results in resistance of GABAA receptors to neuronal excitation.¹⁴ Midazolam exerts its anxiolytic effect by acting on mammillary body and by elevating the glycine inhibitory neurotransmitters. Increased effect of GABA on the motor circuit of brain by midazolam and alterations in the glycine receptors in the spinal cord attributes to its anti-convulsant properties and muscle-relaxant properties respectively.⁴ Apart from these effects, its action by affecting the

opiate receptors has also been well known.¹⁵ Spinal anaesthesia is the most commonly used regional anaesthetic technique. Local anaesthetic although provide adequate anaesthesia, they act for a comparatively shorter duration of time. To overcome this short coming, various additives like intrathecal opioids, have been tried since past few decades to increase the duration of action of anaesthetic solutions.¹⁶⁻¹⁸ The advantages of these adjuvant opioids in providing post-operative anaesthesia are well documented in the literature. However, certain dose-dependent adverse effects have been seen with these opioids such as vomiting, nausea, pruritis, sedation etc.¹⁹ For the management of both acute and chronic and also cancer pain, midazolam has been routinely used via intrathecal route.²⁰⁻²³ The first practical demonstration of midazolam's effect in relieving somatic pain was done by Goodchild and Noble.²⁰ Midazolam facts as a n agonist at the BZP binding sites of GABA-A receptors which forms the rationale for its intrathecal use. With midazolam occupying the receptor sites, an increase in activity of GABA is observed. Stabilization of trans-membrane potential at/near the vicinity of resting potential is the function performed by activated GABA receptors.²⁴ BZP when administered intrathecally spine-mediated analgesia. Processing and stimulation of nociceptive and thermoceptive actions are carried by binding sites of GABA receptors which are most abundantly located in the dorsal root nerve portion with peak amount present in lamina II of nerve cells. The present knowledge and results validates the safe analgesic effect of BZP molecules emphasizing on the absence of prominent irreversible adverse effects.²⁵ Addition of preservative free midazolam to hyperbaric bupivacaine for spinal anaesthesia enhances the duration of anaesthetic effect as compared to plane Bupivacaine without any major adverse effects such as pruritis, respiratory depression etc. Clonidine when administered intrathecally decreases the incidence of postoperative nausea vomiting (PONV). Moreover, intrathecal clonidine does not have any clinically significant effect on perioperative hemodynamic. A small diluted dose of preservative free intrathecal clonidine appears to have few systemic side effects and is free of short term neurotoxicity. Clonidine is a selective partial agonist for $\hat{I}^{\pm 2}$ adrenoreceptors. Its analgesic effect is mediated spinally through activation of post-synaptic $\hat{I}^{\pm 2}$ receptors in substantia gelatinosa of spinal cord. Intrathecal clonidine when combined with local anaesthetic significantly potentiates the intensity and duration of motor blockade due to the fact that $\hat{I}^{\pm 2}$ adrenoreceptor agonists induce cellular modification in the ventral horn of spinal cord and facilitate the local anaesthetic action and prolongation in sensory block can be due to vasoconstrictive effect of clonidine.²⁶

CONCLUSION

Maintenance of spontaneous breath apart from relaxation of muscles required to be relaxed during surgery are the most significant advantages of the spinal anaesthesia. At the same time, it has certain disadvantages also like shorter duration of action, increase in patient's anxiety etc. In brief, intrathecal preservative free clonidine appears safe and has clinically acceptable analgesic properties.

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Identifying and Eliminating Bias in Interventional Research Studies – A Quality Indicator

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ABSTRACT

This review article deals with highlighting the importance of identification and elimination mechanisms of important biases in interventional research studies. In simple terms, Bias means a systematic error that can occur in the event of any phase of the research, during planning, implementing, data collection, analysis and also during publication stage. An in-depth knowledge regarding the bias allows researchers and readers to critically and independently review the scientific literature and avoid interventions which are suboptimal or potentially harmful. A thorough understanding of bias has a stronger implication towards conducting good research and publishing high quality articles, which are very much essential for the practice of evidence-based practice.

Keyword: Identifying and Eliminating Bias

INTRODUCTION

In scientific terms Bias is "any factor or process that tends to deviate the results or conclusions of a trial systematically away from the truth". It can be simply defined as "the deviation from the truth".¹

Bias is not uncommon in interventional trials, but to a greater extent in Indian studies compared with those western trials, says one of the systematic review and comparative empirical analysis of randomized controlled trial reports published in selected Chinese, Indian, and European or North American medical journals.²

The possible reasons for trials appearing biased, which reflect underlying inadequacies in the design and conduct of the trials are:

1. Inadequate knowledge of the researcher in accurate designing and conduction of trials.
2. Indian higher education looks research as a differential component in the academic functioning. It is not considered as a lucrative career option. Apart from this, resource constraints, lack of commitment, lack of proper encouragement, etc., are the impediments that are affecting the quality of research in our institutions of higher education.³
3. Career in pharmacology, physiology and other basic sciences are not rewarding in India. So the doctors who opt for these branches are usually from the bottom of the talent pool. That leads to the poor quality of basic medical research in India.
4. Those researchers and journal editors in India not adopting the CONSORT reporting guidelines⁴, are sole responsible for the rejection of papers in International Journals and publishing of poor quality trials respectively.
5. Research organizations conducting and reporting a trial in favor of the funder, budgeting their efforts⁵ – working more

intensely on some research assignments while neglecting others – that tends to report a poor quality or extremely low number of high quality research papers.

Hence, the authors considered to present this review with the following objectives:

- To become familiar with various types of bias in experimental research study.
- To discuss how bias influences experimental research study and highlights some of its sources.
- To use the knowledge of such biases that may help us recognize them and minimize their impact on the planning of research and health-related decisions.

METHODS

A search strategy was done in 04 electronic databases and e-books, for English-language source, published over the period 1995-2015 for the topics of bias in interventional studies, strategies to overcome those biases, strengthening of interventional studies by elimination of bias in experimental research study. Hand searching was additionally conducted in relevant research methodology books. The intent of this literature search was to identify and review the potential sources of bias in interventional studies and methods to overcome for conducting quality based studies in this review.

RESULTS

The different types of biases that occur in interventional studies are broadly categorized into biases in Randomized Controlled Trials [RCT] and Non-Randomized Studies [NRS].

Further, the review deals with discussing different biases in interventional studies, its sources and highlighting elimination strategies of some of the important biases.

I. Biases that can arise, even before the trial is conducted

1. Choice-of-Question Bias

It is one of the most unrecognized types of bias that occur in RCTs. This bias is concealed within the question that the study intends to answer. This bias may not have a stronger impact on the strength of the study but it may affect the generalizability of the study outcomes.⁶

This bias can take many forms:

- i. Hidden agenda bias:

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It occurs when a trial is mounted, not in order to answer a question, but rather to demonstrate a pre-required answer.

ii. Cost and convenience bias:

It occurs when a study is done on a basis of what we can afford to study, or what is convenient to study, rather than what we really want to study. It can seriously compromise what we choose to study.

iii. Funding availability Bias:

It occurs where studies tend to concentrate on questions that are more readily fundable, often for a vested or commercial interest.⁷

2. Bureaucracy Bias

- In simple terms it can be called as Institutional Review Board (IRB) bias.
- It most commonly occurs when IRB are unduly constrictive, and non-permissive for the study of important concepts.
- It also occurs when IRB unduly allows and encourages studies which are scientifically invalid, but having the potential hold to get the funds or name to the institution.⁶

II. Biases that can arise, during the actual course of the trial

1. Population Choice Bias

This bias can occur when the sample is drawn multiple times from the same population and it can have profound impact on the external validity of randomized trials.

In certain conditions, the sampling is done with a specific gender predilection (*gender bias*) or towards a particular age group (*age bias*), the outcomes of such study may not be generalizable to the study population.

There are subgroups of population choice bias like *informed consent bias*, *literacy bias* and *language bias* wherein the investigators may intentionally avoid eligible patients just because they do not comprehend the consent form.⁶

2. Intervention choice Bias

It occurs when the type of the intervention chosen by the investigator can affect the study outcomes widely.⁶

i. Complexity bias

It can occur when a trial is used to study complex interventions, with a number of components, or where outcomes may depend on multiple contingencies outside of the control of the investigator (e.g. the skill of the surgeons or the resources of the community).

3. Control group bias

This bias may appear when the intervention group is compared with control group of poor design, which may erroneously project the outcomes to be more (or less) effective. Comparing an interventional group with a placebo clarifies the intervention is effective or not. But, it does not reveal the experimental intervention provides better outcomes or not compared to the existing ones.⁶ An obvious way to make an intervention appear to be more effective than it really is would be to choose an ineffective comparison group.

4. Outcome choice Bias

i. Measurement bias

It occurs in those RCTs that evaluate outcomes which are easy to measure, rather than the outcomes those are relevant.

ii. Time term bias

It occurs in those RCTs where short-term outcomes are measured

rather than the important long-term outcomes.

5. Selection Bias

Randomization is an important protocol in RCTs which ensures that all the study participants are provided with equal opportunity to be selected for each study groups.⁸

Selection bias can occur if some potentially eligible individuals are selectively excluded from the study, because the investigator knows the group to which they would be allocated if they participated.

How can selection bias be reduced?

- Selection bias can be reduced by concealing the randomization sequence from the investigators at the time of obtaining consent from potential trial participants.
- *Allocation concealment* is a very simple maneuver that can be incorporated in the design of any trial and that can always be implemented.
- Allocation concealment defined “as an important technique which protects the randomization mechanism, ensuring that the patient is completely unaware of the treatment been rendered before entering into the study”.⁹
- Despite its simplicity as a maneuver and its importance to reduce bias, allocation concealment is rarely reported, and perhaps rarely implemented in RCTs. If, however, allocation concealment was not carried out, the majority of RCTs are at risk of exaggerating the effects of the interventions they were designed to evaluate.
- Sometimes, the researchers do tend to access the allocation codes, which are kept in sealed opaque envelopes. The most commonly used methods are powerful lights or high intense steam to open the envelope and later reseal it, before others notice it. This may cause selection bias into RCTs.⁶

6. Ascertainment Bias

Ascertainment bias occurs when the results or conclusions of a trial are systematically distorted by knowledge of which intervention each participant is receiving.

Ascertainment bias can be introduced by:

- The person administering the interventions,
- The person receiving the interventions (the participants),
- The investigator assessing or analyzing the outcomes,
- The report writer who describes the trial in detail.
 - i. Participant ascertainment bias: If participants know that they have been allocated to the placebo group, they are likely to feel disappointed and less willing to report improvement at each of the study time points.
 - ii. Observer bias: If the people in charge of assessing and recording the outcomes know which patients are allocated to each of the study groups, they could, consciously or unconsciously, tend to record the outcomes for patients receiving the new drug in a more favorable way than for patients receiving placebo.

How can Ascertainment bias be reduced?

The best way to protect a trial against ascertainment bias is by keeping the people involved in the trial unaware of the identity of the interventions for as long as possible. This is called blinding or masking.

Ascertainment bias can widely be reduced by blinding all the concerned people involved in the trials: the intervention providers, the interventions receivers and those concerned with

assessment and reporting the outcomes.^{7,9}

The strategies that can be used to reduce ascertainment bias can be applied during at least two periods of a trial:

- a. During the time of Data collection
- b. After data have been collected

Strategies to reduce ascertainment bias during data collection phase

The best strategy to reduce ascertainment bias during data collection is with the use of placebos. *Placebos* are interventions believed to be inactive, but otherwise identical to the experimental intervention in all aspects other than the postulated specific effect. One of the best comparisons in any trials are the Placebos, which are very easy to develop and apply in drug trials, and it is important that the placebo should resemble in taste, smell and appearance of the active drug, and should be delivered using same procedure as for the active drug.

Strategies to reduce ascertainment bias after data collection phase

This bias can occur easily after data collection, which can be controlled by keeping anonymity of the study groups, with the people involved with data analyzing and reporting the trial outcomes.

In any trial, the coding of the study groups should be done prior to the time of providing the data to the statistical analysis, wherein the results thus obtained will contain the same codes and further the similar codes are followed until the trial reporting stage. The codes remain undisclosed until all the process of analysis and reporting of the trial is completed.⁶

Selection Bias [Bias due to lack of allocation concealment]	Ascertainment Bias [Bias due to lack of blinding]
<i>Allocation concealment</i> helps to prevent selection bias, protects the randomization sequence <i>before</i> and <i>until</i> the interventions are given to study participants and can be always implemented.	<i>Blinding</i> process helps to prevent ascertainment bias by protecting the randomization mechanism, even after the allocation to the study groups is done. It may or may not facilitate to implement in certain conditions. ⁷

7. Contamination Bias

The control group subjects may mistakenly receive the maneuver of interest or be affected by an extrinsic maneuver, which diminishes the differences in outcomes of the experimental and control groups.

8. Compliance Bias

Sometimes, there can be erroneous outcomes which can impact the efficacy of the treatment rendered to the patients, and it could be possibly due to non-compliance to the treatment regimen.¹⁰

9. Bogus control Bias

When subjects allocated to the experimental maneuver group expire or withdraw before the maneuver is administered and are reallocated to the control group or are omitted, the experimental and control groups are no longer matched and the differences between may be biased toward the experimental group.

10. Proficiency Bias

Absence of establishing the equilibrium with respect to the experimental interventions or treatments rendered to subjects

can cause this bias.¹⁰

I. Biases that occurs during reporting of a trial

1. Withdrawal Bias

- This Bias can happen due to incorrect management of data pertaining to patients' refrainment, withdrawal mechanism and protocol violations.
- Any researcher would expect that all the trial participants should follow the protocol, provide data on all study outcomes at each point in time and ensure to complete the trial. However, dropouts are most commonly encountered in many studies.
- Dropouts can happen because of some participants tend to refrain away from the study before the trial is completed or inappropriate following of the protocol or because certain study outcomes are incorrectly measured or even with the problems of multiple repeated measures.⁶
- On occasion, it is impossible to know the status of participants at the times when the missing information should have been collected. Example: Relocation of participants without informing the investigator or failing to contact for an unknown reason. Those outcomes measured and analyzed excluding these participants, and if it is related to the interventions or the treatment rendered, can cause bias.⁶

Reduction Strategies that can be used to eliminate withdrawal bias

- The first strategy is *intention-to-treat analysis*, which deals with including all the study participants in the data analyses, randomly allocated to their respective groups, irrespective of whether the participants completed the study or not.
- The second strategy is *sensitivity analysis*, which deals with accounting the worst possible outcomes or time points with worst results on one end or similar confinement of best possible outcomes or time points in the group that shows the best results on the other end with reference to the dropouts. This is followed by sensitively analyzing the data for possibility of the results that may support or refute the initial analysis results, which includes the missing data.¹¹

2. Selective Reporting Bias

A major and common source of bias in an RCT is selective reporting of results, describing those outcomes with positive results, or which favor the studied intervention.

The sub-categories of this bias are:

- *Social desirability bias* in which the items that are desired, are more likely to be reported.
- *Data dredging bias / Interesting data bias*: Following the data analysis, the researcher may get influenced with those outcomes which are of more concern / interesting to them and subsequently report them, leaving behind the lesser important ones.⁶

Steps to reduce biases that occur during the course and reporting of a trial

- Double blinding subjects and investigators when possible, to prevent knowledge of exposures from influencing the detection of outcome events.
- Robust instrument development and validation process for data collection.
- Hide the identity of the subjects from the data collector

when possible.

- Create a division of labor by having a different person record data than performs the maneuver.
- Maintain good contact to avoid attrition from the study.

IV. Biases that can occur during dissemination of the trials

1. Publication bias

Publication bias may occur if any journal is more inclined to publish only the studies with positive outcomes or those with good study designs. This cannot be identified within a single study but rather it can be elicited better in systematic reviews and meta-analysis. This can lead to over-emphasis of the outcomes and may mislead the readers.¹²

The failure to write and publish negative results is not a random event, but is heavily influenced by the direction and strength of research findings, whereby manuscripts with statistically significant (positive) results are published preferentially over manuscripts reporting non-significant (negative) results.

How to reduce publication bias?

- Publication bias can be eliminated through compulsory registration of trials at inception, and publication of the results of all trials.
- Establishing the equilibrium between numbers of studies published with positive and negative results.
- Sensitization of the researchers should be done regarding the importance of negative studies being published, with journals giving equal space for the publication of the same.
- Evaluation of studies should be based on the internal validity of the study rather than the conclusions.¹³
- Identify funding sources and possible conflicts of interest.

Variants of publication Bias:

i. Language bias

Bias which may arise due to predilection of certain authors for submitting and publishing their papers by journals in different languages, based on the direction of their results. E.g.: Presumption that studies with positive results are more published in English.⁶

ii. Time lag bias

Bias that occurs when the speed of publication depends on the direction and strength of the results of the trial. In general, it seems that trials with 'negative' results take twice as long to be published as 'positive' trials.

V. Biases that can occur during uptake phase of the trials

The following are some of the biases which are most common and pertinent:

1. Relation to the author bias / rivalry Bias

Bias that can occur by under-rating the strengths or exaggerating the weaknesses of studies published by a rival.

2. Clinical practice Bias

It takes place when readers judge a study according to whether it supports or challenges their current or past clinical practice (e.g. a clinician who gives lidocaine to patients with acute myocardial infarction underrating a study that suggests that lidocaine may increase mortality in these patients)¹¹.

VI. Miscellaneous Types

1. **Technology bias:** Bias which relates to judging a study according to the reader's attraction or aversion for

technology in health care.

2. **Resource allocation bias:** It happens when readers' exhibit strong inclination for certain types of provision of resources. It is more widely seen in health care sector, originating from its potential stake holders ranging from consumers to policy makers.⁶
3. **Trial design bias:** It occurs when a study that uses a design supported, publicly or privately, by the reader (e.g. a consumer advocate overrating an RCT that takes into account patient preferences).
4. **Flashy title bias:** It happens when the study results are overvalued based on their attractive titles (especially by the journalists) or undervalued by the academicians, considering as undue sensational in the field.⁶

Bias in Non-Randomized Experimental Studies

Bias may be present in findings from Non-Randomized experimental studies in many of the same ways as in poorly designed or conducted randomized trials. For example, the indistinct exclusion criteria, absence of monitoring the standardized protocols during intervention and outcome assessments and lack of blinding are the most probable causes for bias, irrespective of whether the trial is randomized or non-randomized.¹⁴

- Non-randomized experimental study are susceptible to the same bias as RCTs.
- Selection Bias – caused by inadequate selection of participants.
- Performance Bias – caused by inadequate measurement of intervention.
- Detection Bias – caused if the assessment of outcomes is not standardized or blinded.
- Attrition biases – caused by inadequate handling of incomplete outcome data because of drop-outs.¹⁵
- Reporting Bias – caused by selective outcome reporting

The study designs classified as NRS, and their varying susceptibility to different biases, makes it difficult to produce a generic robust tool that can be used to evaluate risk of bias.¹⁶ 19th Cochrane Colloquium and VI International Conference on Patient Safety, held at Madrid during 19 – 22 October 2011 has dealt with development and validation of a new Instrument – Risk of Bias Assessment tool for Non-Randomised Studies (RoBANS). And discussion concluded that RoBANS is a valid tool designed to assess the Risk of Bias of Non-Randomised Studies.

The Cochrane's RoB tool and GRADE (Grading of Recommendations Assessment, Development and Evaluation), endorses RoBANS, henceforth it can be incorporated into RevMan and GRADEpro, which appears to be useful to undertake systematic reviews.¹⁷ A Cochrane Risk Of Bias Assessment Tool: for Non-Randomized Studies of Interventions (ACROBAT-NRSI) is another robust tool that can be used for evaluating the risk of bias in the results of non-randomized studies of interventions that compare the health effects of two or more interventions.¹⁸

CONCLUSION

Bias is an ever-present and insidious problem in research study design and execution, and while no study design is exempt from bias, some are more prone to particular types. The main reason

of bias is the absence of rigorous methodology or the inability to assess the potential link between the cause and an effect in the target population.

An imperative objective in study outline is that the outcomes are substantial and generalizable to the larger population. Efforts to implicate rigorous statistics to minimize the bias may divert the readers. Better an investigator anticipates the potential areas of bias in every phase of the trial to achieve a much valid results.

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Nutritional Status and Feeding Practices in Relation to IYCN Policy Among Children under 2 Years of Age in Tertiary Care Centre

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ABSTRACT

Introduction: Nutritional status of under-5 children is an indicator of the health status of the nation. Malnutrition has its root in maternal health as well as feeding practices in the community. Study was planned with the objective to determine the incidence of feeding practices i.e. breast feeding and complementary feeding and malnutrition in 0-24 months age children according to Infant and Young Child Nutrition [IYCN] policy of WHO.

Material and methods: A non-experimental descriptive study was conducted in an urban tertiary centre including children between 0-24 months of age. Their clinical examination, anthropometry, WHO classification of malnutrition and dietary information was recorded on structured questionnaire.

Results: Of the 125 children, 44% were malnourished. Exclusive Breast Feeding was given by only 36.8% mothers. Colostrum feeding was practiced in 83.2% children. Prolactal consumption was noted in 54.4% children. 52% mothers initiated Breast Feeding in first hour of birth, of which 59% children had no malnutrition. Only 38% children received complementary feeding between 6-9 months of age. Complementary feeding with continued Breastfeeding till 1 year of age was noted in 71% children. Relation between age of starting complementary feeding and malnutrition was statistically significant [$p=0.020$]. Minimum dietary diversity was noted in 47.2% children.

Conclusion: Breast feeding initiation within 1st hour of birth and Complementary feeding at 6 months are imperative to prevent malnutrition. The relation between early and delayed complementary feeding and malnutrition was statistically significant, thus emphasizing that optimum timing of initiating complementary feeding along with breast feeding play a key role in preventing malnutrition.

Keywords: Breast feeding, complementary feeding, malnutrition

INTRODUCTION

Infant and young child feeding practices are of prime importance to maintain the nutritional status of children between 0-24 months of age and are often influenced by traditional practices. Infant and young child feeding practices, malnutrition and child survival rates in the country are interlinked. Emphasis on improving these practices is an imperative step for better development and health of children.¹ Infection and malnutrition during the peak period of development in the first two years of life affect the growth potential of children. Breastfeeding is a basic human activity, vital to infant and maternal health and of immense economic value to households and societies.² Breastfeeding lowers mortality associated with bloody and chronic diarrhoea and confers apparent protection at least upto 3 months after weaning.³ Breast feeding provides abundant benefits to the mother and child both in first 6 months of life. However, thereafter complementary feeding is required for optimal growth of the child. Higher rates of malnutrition have been observed in 12-24 months children in low socioeconomic

population in India. The WHO recommends that, infants should be exclusively breastfed upto first six months of life and thereafter provided complementary foods with continuation of breastfeeding upto two years of age.⁴ Country wide National Family Health Survey II (NFHSII) data show mean underweight prevalence increases from 11.9% among infants fewer than six months of age to 58.4% at 12-23 months of age.⁵ Of 1000 children born in Maharashtra 38 do not live to see their first birth day (IMR- Infant Mortality Rate = 38). Total 58 children succumb by five years of age (Under Five Mortality Rate = 58). This implies that younger the child, higher the chances of morbidity and mortality. Most deaths contributing to U5MR occur before completion of three years (Table-1).

Through the above data, the initiation of breast feeding and complementary feeding play a significant role in malnutrition at 0-2 years. Thus the need for studying the feeding pattern and practices is imperative for prevention of malnutrition.

Aims and Objectives of the study were to determine the incidence of feeding practices i.e. breast feeding and complementary feeding in 0-24 months age children according to IYCN policy, to determine the incidence of malnutrition in children below 2 years and to correlate nutritional status with feeding practices in children of age 0-24 months.

MATERIAL AND METHODS

Non-experimental descriptive study was conducted in the Department of Pediatrics of a tertiary care centre over a period of 3 months after obtaining requisite permission of the Ethics committee of the hospital. 125 children of 0-24 months age, attending the Pediatric out patient department were included in the study; of which 36 were between 0-6 months and 89 were of 7-24 months age. Children who were sick, had chronic ailments, preterm children, syndromic children and children who were not accompanied by their mother/immediate caretaker were excluded from this study. Parents were explained about the study by investigating pediatrician and informed consent was obtained from parents of all patients included in the study.

Research Design: Children were assessed through clinical examination and anthropometry including height/length, weight, weight for height z-score which were plotted on

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WHO growth charts accordingly children were classified in No Malnutrition, moderate acute malnutrition (MAM) and severe acute malnutrition (SAM). Children were weighed using Pediatric Digital weighing machine and Length, Height were measured by Infantometer and Stadiometer respectively. Information regarding Breastfeeding (Received Colostrum/prelacteals/time of initiation of 1st breast feeding/duration of exclusive breast feeding), complementary feeding (age of initiation/type of first food) and 24 hour dietary recall were obtained from the mother of the child through a structured questionnaire. Through the obtained data we emphasized on the Core Indicators of IYCF i.e. 1. Early initiation of breast feeding. 2. Exclusive breastfeeding under 6 months. 3. Continued breastfeeding at 1 year. 4. Introduction of solid, semi-solid or soft foods. 5. Minimum dietary diversity: It is proportion of children with 6–23 months of age who received foods from four or more food groups of the seven food groups in the last 24 hours: (i) cereals, legumes (ii) pulses and nuts (iii) milk and milk products (iv) meat, poultry (v) eggs (vi) vitamin A rich fruits and vegetables; and (vii) other vegetables.¹ Minimum dietary diversity was calculated in children 6-24 months age.

STATISTICAL ANALYSIS

Data was analysed using SPSS Software. Chi square test was used for selective data evaluation.

RESULTS

Total 125 children between 0-24 months were included in the study with sex distribution of 70 males and 55 females. Based on the age, children were categorized into Group 1 of 0-6 months (23M:13F) and Group 2 of 7-24 months (47M:42F) The mean age in group1 was 3.98 months and in group 2 was 14.95 months. Amongst 125 children, 70 children (56%) had no malnutrition (group1 n=17, group 2 n=53). Whereas, 21.6% (n=27, Group1=11, group2=16) had Moderate acute malnutrition and 22.4% (n=28, Group1=8, group 2=20) had Severe acute malnutrition. Thus the overall incidence of malnutrition in this study was 44%.

Colostrum feeding was practiced in 83.2% children. Also prelacteal consumption was noted in 54.4% children. The commonest prelacteals were honey and jaggery water. Exclusive Breast feeding upto 6 months was given by only 36.8% (n=46) mothers. 52% (n=65) mothers initiated breast feeding within 1st hour of birth, while 18.4% (n=23) initiated breast feeding after 24 hours, of which 5 mothers started BF after >72 hours. 59% of children (n=38) who received Breast feeding within 1st hour of birth were not malnourished, whereas 54% and 52% children who were breastfed at 1-24 hours and >24 hours respectively, were not malnourished. However, the relation between duration and onset of breast-feeding with malnutrition in children upto 24 months was not statistically significant (p=0.582, p=0.099 respectively).

Complementary feeding with continued Breastfeeding till 1 year of age was noted in 71% children. Only 38% of children received Complementary feeding between 6-9 months age, as compared to 48.8% children who were started on complementary feeding before 6 months of age, in some cases on day1 of life. The children who received complementary feeding at 9 months of age and beyond, 60% had severe acute malnutrition. The correlation between age of starting complementary feeding and malnutrition was found to be statistically significant (p=0.020) (Figure-1). Minimum dietary diversity Score (<=4 food groups) was noted in 47.2% children. Of these children, 42.4% were malnourished. There was no correlation between minimum dietary diversity and malnutrition (p=0.87).

DISCUSSION

The World Health Organisation, in its Infant and young child nutrition policy, highlights the need for emphasis on basic feeding practices to prevent malnutrition which is a major worldwide cause of childhood mortality especially in children below two years of age. Thus we carried out this study in our outpatient department in children mainly attending for immunization. Small sample size, selection bias and lack of maternal and demographic data are some of the limitations of our study. We found exclusive breast feeding upto 6 months was given by only 36.8% mothers. These findings are supported by previous studies from different parts of the world.^{7,8} However, the low prevalence of EBF at six months of age in our study was substantially lower than previous studies⁷ but higher than recent studies from India (7.8% and 16.5%).^{9,10} Studies indicate the prevalence of exclusive breastfeeding at six months is generally low in low resource countries and varies from 9%¹⁰ to 40%.¹² In our study, 52% and 18.4% mothers initiated breast feeding within 1 hour and after 24 hours of birth respectively. Vijayalakshmi et al demonstrated that only 36.9% of the mothers had initiated breastfeeding within an hour.¹³ Delay in initiation of breastfeeding as cited by the mothers were attributed to delay in shifting the mothers from labour room, babies were

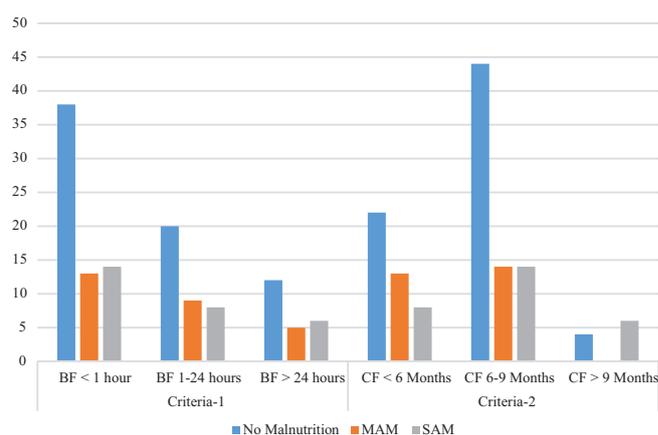


Figure-1: Relation of Malnutrition to Feeding Practices

Indicators	Maharashtra 1998 NFHSII	Maharashtra 2005 NFHS III	India 2005 NFHS III
Initiation of BF in <1 hour	23%	52%	53%
0-6 months Exclusive BF	7%, 4-5months	53%, <5months	46%, <5months
Appropriate CF at 6-9 months	31%	48%	56%
Malnutrition 0-3 years	50%	40%	46%

Table-1: National Family Health Survey Data [Govt. Of India]⁶

in neonatal ICU, Caesarean section and family restriction. This is higher than the studies conducted from different parts of the world ranging from 6.3% to 31%.^{14,15} However, the data in various studies in India shows that initiation rates vary from 16% to 54.5%.¹⁶ The relation between duration and onset of breast-feeding with malnutrition in children upto 24 months was not statistically significant in our study. However, in a study by Rasanian et al, 72(20.3%) children where breast-feeding was initiated within two hours of birth while in 56(15.82%) children it was delayed beyond two days of delivery. Delay in initiation of breastfeeding was associated with severe malnutrition.¹⁷

The incidence of providing complementary feeding with continued Breast feeding till 1 year of age was 71%. In our study, only 38% of children received Complementary feeding between 6-9 months age. 48.8% and 60% of children receiving early and delayed complementary feeding respectively, had malnutrition. In our study, the correlation between age of starting complementary feeding and malnutrition was found to be statistically significant ($p=0.020$). Similarly, in a study by Rasanian et al, complementary foods were started at optimum age in 42.9% children, started early (<4 months) in 24.5% children while in rest it was delayed beyond six months. Severe malnutrition was significantly higher in children where weaning was delayed.¹⁷ Assenso,¹⁸ while assessing the effect of prolonged breast feeding on the nutritional status, observed considerably lower nutritional status of children who continue to receive the breast milk upto 2nd and 3rd year of life in comparison with fully weaned children in the same year. Thus, early as well as late initiation of Complementary feeding is clearly associated with malnutrition. We noted a tendency to feed mainly milk, cereals and legumes as complementary foods, with lesser emphasis on fruits and vegetables. Gautam et al demonstrated a lower proportion of infants with minimum meal diversity (35%).¹⁹ A study in South Asian countries reported that the children of 6–23 months had received minimum dietary diversity (82%), India (15%), Sri Lanka (71%).¹⁹ Sakaa et al in a study in Ghana demonstrated an MDD in 34.8% children of 6-23 months age.²⁰ The high percentage of malnutrition in these children may be attributed to the faulty food consistency which is traditionally fed to children as well as to less emphasis on iron and vitamin rich food groups in our country.

CONCLUSION

Breast feeding must be initiated within 1st hour of birth to prevent malnutrition. Lactation support should be available at all hospitals. Optimal timely complementary feeding should be started at 6 months. Also emphasis of providing variety of food groups to the child is desirable for achieving the growth potential of child who is the future torchbearer of the nation.

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Peripheral Ossifying Fibroma: Report of 2 Cases with Management

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ABSTRACT

Introduction: Peripheral ossifying fibroma (POF), accounting for about 9% of all gingival growths, is commonly seen in females in the interdental papilla and the anterior part of the maxilla. It is a clinician's concern because of its unknown etiology, unpredictable clinical course and chances of recurrence. The treatment of choice for such gingival growths is surgical excision, however the recurrence rate is reported to be 7–45%. Lasers have been used extensively in dental practice and hence excision of such lesions with the help of lasers has become a possible, and patient-preferred approach.

Case report: This case report presents 2 male patients with gingival overgrowth in the mandibular right lateral-canine region and in maxillary left central-lateral incisor region respectively. Surgical excision of the lesion was done with scalpel method in first case and laser excision in the second case followed by histopathologic confirmation with emphasis on the clinical aspect.

Conclusion: This case report showed similar healing following surgical excision using scalpel method and laser. However laser excision was better due to minimal bleeding and patient discomfort.

Keywords: Peripheral ossifying fibroma, gingival overgrowth, laser excision, excisional biopsy.

INTRODUCTION

Epulis refers to a series of reactive gingival lesions which is commonly produced by irritating agents. Their diagnosis is usually made on the basis of clinical and histologic findings. Many types of localized reactive lesions are reported on the gingiva, including pyogenic granuloma, peripheral giant cell granuloma (PGCG), and peripheral ossifying fibroma (POF).¹⁻² The POF exhibits a peak incidence between 20 and 30 years of age, but may also occur at any age.³ The lesions have a Female: Male ratio of 4.3:1. The recurrence rate can reach as high as 20%. The lesions are most often found in the interdental papilla region, located anterior to the molars and in the maxilla. Clinically, the lesions appear as a well-defined and slow-growing gingival mass which is usually lesser than 2 cm in size, although larger ones may also occur occasionally. In majority of cases, there is no apparent underlying bone involvement visible on the radiograph. The lesion may be sessile or pedunculated and the color resembles that of the gingiva or slightly reddish. This article presents two cases of Peripheral Ossifying Fibroma that was diagnosed and treated in our department.

CASE PRESENTATION

Case 1

A 51-year-old male patient reported to Department of Periodontics and Oral Implantology with the chief complaint of a “lump that causes difficulty in eating” in the right lower front region of the jaw since 1 year. The lesion had started as small growth, which gradually increased to the current size. The lesion did not bleed and there was no history of pain. The patient gave

a history of beedi smoking for the past 30 years and smoked 1 pack of beedis per day. There was no relevant medical and dental history. Clinical examination revealed a single, sessile, pale pink gingival overgrowth, measuring about 1.5 x 1 cm extending from mesial aspect of mandibular right lateral incisor up to the distal aspect of mandibular right canine (Figure-1). The growth was firm in consistency, had a non-ulcerated surface and was non-tender on palpation. The patient had a poor oral hygiene as determined by Oral Hygiene Index-Simplified (Greene and Vermillion 1964). Intra oral periapical radiograph (IOPA) of the involved area was taken which revealed a mild horizontal bone loss (Figure-2). Provisional diagnosis of POF and pyogenic granuloma was given. Surgical excision of the lesion was performed following scaling and root planing and sent for histopathological examination. A periodontal pack was placed. The patient was recalled after 10 days for pack removal. At 10 days follow-up, the area seemed to heal well. A 4-week follow-up photograph has been shown (Figure-1).

The H and E stained section showed a parakeratinised stratified squamous epithelium with pseudo epitheliomatous hyperplasia overlying a dense fibrous stroma. The connective tissue showed dense bundles of collagen fibers with spindle shaped fibroblasts along with focal areas of hyalinization. Stroma showed few calcified deposits in the form of irregular trabeculae of bone and dystrophic calcification. The histopathological examination confirmed the provisional diagnosis of Peripheral ossifying fibroma. (Figure-2)

Case 2

A 22-year-old male patient reported to the Department with a complaint of growth in the gums in the upper front left region. The patient noticed the lesion 12 months back which slowly progressed to the present size. It was painless and the patient's complaint was discomfort because of cosmetic reasons. Extraoral examination did not reveal any abnormalities with no palpable regional lymph nodes. Interdental papilla in the region of maxillary left central and lateral incisor revealed a pedunculated, enlarged lesion measuring around 0.9 cm x 0.7 cm. The growth was pinkish red, soft with a smooth surface and was not ulcerated (Figure-3). Bleeding was elicited when the lesion was gently handled with a blunt probe indicating

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inflamed and engorged tissue. The patient had a fair oral hygiene as determined by Oral Hygiene Index-Simplified (Greene and Vermillion 1964). Intraoral periapical radiographs revealed no abnormality with normal periodontal ligament space, lamina dura and periapical tissues (Figure-4). A provisional diagnosis of POF, pyogenic granuloma and irritational fibroma was considered. Teeth in the area of involvement were thoroughly debrided. Laser excision was performed 0.5-1 mm beyond the lesion's extent using diode laser of 980 nm (Hager and Werken GmbH and Co KG) delivered through an optical fiber with 320 μ m fiber-tip at 3 W and in a continuous wave and contact mode. A thorough curettage of the underlying surface and root planing was performed on the adjacent teeth with the periodontal curettes. During the entire procedure, tissues were well coagulated. A superficial layer of fibrin was seen following a week and 4 weeks after surgery the wound was completely healed (Figure-3).

The excised specimens after due processing were evaluated. The H and E stained section showed a slightly hyperplastic parakeratinised stratified squamous epithelium overlying a fibrocellular stroma. The stroma was highly cellular containing fibrillar collagen with numerous dense plump fibroblasts, fibrocytes and inflammatory cells chiefly composed of lymphocytes and plasma cells. Focal areas of osteoid like tissue and many areas of hyalinization were seen in the stroma. Few blood vessels engorged with RBC's were also present (Figure-4). A final diagnosis of POF was arrived at by the Pathologist.

DISCUSSION

Gingiva in the oral cavity has shown to present with the largest number of lesions which ranges from inflammatory to neoplastic, POF being one such lesion. POF is a non-neoplastic enlargement occurring in the interdental papilla and the anterior part of the maxilla. The predilection of POF to occur in the anterior part of the maxilla is disputable with another source stating that mandible especially the pre-molar and molar areas being the common sites of involvement.⁴ The higher incidence of POF is seen in the 2nd decade and declining incidence after the 3rd decade. POF may present as a pedunculated nodule, or it may have a broad attachment base. These lesions can be red to pink with areas of ulceration and their surface may be smooth or irregular. The lesion varies from 0.4 to 4.0 cm in size.⁵ However, a case of giant POF of 9 cm is also reported in the literature.⁶ The etiopathogenesis of POF is uncertain. However, local irritants like dental plaque or trauma causes the cells of the periodontal ligament to give rise to such a lesion. The reasons for considering periodontal ligament origin for POF include exclusive occurrence of POF in the gingiva (interdental papilla), the proximity of gingiva to the periodontal ligament and the presence of oxytalan fibers within the mineralized matrix of some lesions.⁷ Gingival injury, gingival irritation or subgingival calculus causes excessive proliferation of mature fibrous connective tissue. Chronic irritation of the periosteal and periodontal membrane causes metaplasia of the connective tissue and resultant initiation of formation of bone or dystrophic calcification.

There have been suggestions that the POF represents a different clinical entity and not a transitional form of pyogenic granuloma, PGCG, or irritation fibroma. Eversole and Rovin¹



Figure-1: Pre-operative view and 4 weeks follow up of case 1 following scalpel excision

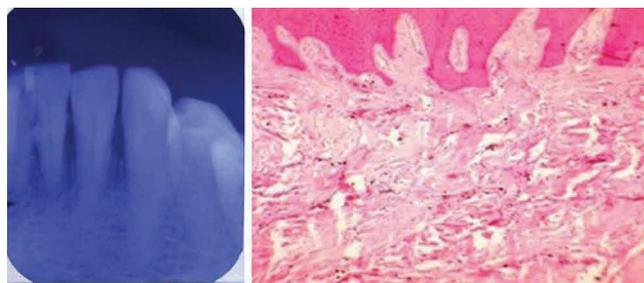


Figure-2: IOPA and Histopathological picture of case 1



Figure-3: Pre-operative view and 4 weeks follow up of case 2 following laser excision

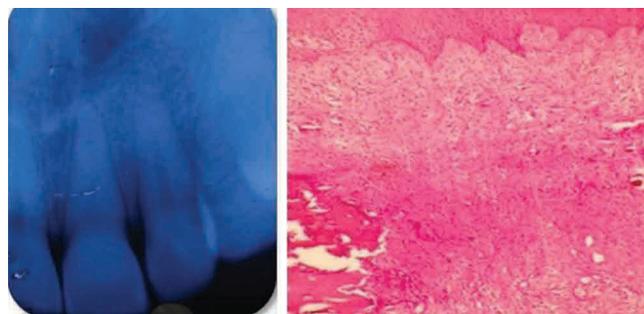


Figure-4: IOPA and Histopathological picture of case 2

stated that with the similar sex and site predilection of pyogenic granuloma, PGCG and POF, as well as similar clinical and histologic features, these lesions may simply be varied histologic responses to irritation. Gardner² stated that POF cellular connective tissue is so characteristic that a histologic diagnosis can be made with confidence, regardless of the presence or absence of calcification. Buchner and Hansen³ hypothesized that early POF presents as ulcerated nodules with little calcification, allowing easy misdiagnosis as a pyogenic granuloma. Pyogenic granuloma shows surface ulceration on a red mass with vascular proliferation resembling granulation tissue microscopically. Giant cells are seen scattered in a fibrous stroma in cases of PGCG. Accordingly, POF should be differentiated from such reactive lesions of a gingiva.

Radiographic features of POF may vary. Radiopaque foci of calcifications have been reported in some cases and are scattered in the central area of the lesion. POF usually does not involve

the underlying bone. However, superficial erosion of bone could be seen in some cases.⁵

The basic microscopic pattern of the POF is fibrous proliferation associated with the formation of mineralized components. A confirmatory diagnosis of POF is made by histopathologic evaluation of biopsy specimens. Microscopic examination usually reveals intact or ulcerated stratified squamous surface epithelium; benign fibrous connective tissue with varying numbers of fibroblasts; sparse to profuse endothelial proliferation; mineralized material consisting of mature, lamellar or woven osteoid, cementum-like material or dystrophic calcifications; and acute or chronic inflammatory cells in lesions.^{7,5} Moreover, histopathologically, lamellar or woven osteoid pattern predominates; hence, the term "POF" is considered more appropriate.

If surgical intervention in an early stage is not done, POF can become large, causing extensive destruction of adjacent bone and significant functional or aesthetic alteration.⁶ Different treatment modalities include surgical excision by scalpel, laser or electrosurgery. Surgical excision includes the removal of involved periodontal ligament and periosteum and hence is also the preferred treatment,⁶ which was performed in the first case. The advantages of laser excision are minimal post-surgical pain and no need for suturing the biopsy site. Alam *et al.*, claimed to perform the first laser excision (diode) of cemento-ossifying fibroma of 3 cm × 2.5 cm.⁸ Iyer *et al.*, suggested that laser excision is one of the best option for management of POF following a case of successful laser excision of POF with minimal intraoperative bleeding, post-operative pain, and excellent healing at the end of 1 week.⁹

Close postoperative follow-up is required because of the growth potential of incompletely removed lesions, as well as 8% to 20% recurrence rate.¹⁰ It is important to remove lesions completely by including subjacent periosteum and periodontal ligament, besides the possible causes, to reduce recurrence. The first recurrence is usually noted within 12 months.⁸

CONCLUSION

POF stands a concern for the physician owing to its unknown etiology and pronicity for recurrence which is 8-20%. It is a benign, slowly progressive lesion, with limited growth. Histopathologic confirmation is mandatory as clinical diagnosis is difficult. Many cases will progress for long periods before patients seek treatment, because of the lack of symptoms associated with the lesion. Treatment consists of surgical excision, including the periosteum and scaling of the adjacent teeth. In the above cases, laser excision was better due to the minimal bleeding and discomfort to the patient. However post-operative healing in both the cases were similar. The recovery of the current patients were uneventful and the patients have not shown recurrence of the lesion for about one year.

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Comparison of Levels of Stress in Different Years of M.B.B.S. Students in A Medical College - An Observational Study

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ABSTRACT

Introduction: Stress in medical students can't be ignored as it sometimes leads to frustration and suicidal tendency. This study was aimed to find out the prevalence and to compare the level of stress in different years of MBBS medical students. Further we also tried to find out the probable causes in different years of MBBS students so that we can take early intervention in right direction to minimize the stress depending upon the cause.

Material and Methods: MBBS students from different years participated in this study. By using the Kessler Psychological Distress Scale (K10) the prevalence and the level of stress of were found out. Comparison of level of stress in different academic year was done by Kruskal-Wallis One Way Analysis. Multiple comparison of stress among different academic year was analysed by Dunn's Method.

Results: The total prevalence of stress in second year was 46.15% and the prevalence of stress in final year was found to be 85.93%. It was found that prevalence of mild stress was higher among all the years of MBBS. Also severe stress in some students can't be ignored completely. When we compared levels of stress in different years of MBBS, we found that there was a statistically significant difference in the level of stress among all the years of MBBS students with the P value less than 0.05. It was further evaluated by Dunn method which showed that level of stress in final year students was statistically significant as compared to second year and third year.

Conclusion: In all the years of MBBS students mild level of stress was more common. When compared, final year students found to be more stressful than second and third year. All these findings suggested that there is need to reduce the stress in medical students in all the four years of MBBS study and enroll them for stress management program.

Keywords: Dunn's Method, k10 kessler scale, kruskal-wallis, MBBS, students, stress

INTRODUCTION

Anything that poses a risk or a threat to our well-being is a stress. Many people, around the world suffer from many kind of stressors. Medical students are also not excluded from this. As history indicates there were increased number of cases of frustration, drop out and suicidal tendency among medical students. Time has come to know the level of stress and to find out causative factors of stress in medical students.

Presence of stress make medical student lonely, introvert. It may also affect their cognition, health. Medical students are the ones who will become future physicians and more than this they are responsible individuals in the society and health system. Thus, it is important for medical students to be stress free.

Various studies on medical students have been done across the years to study stress and its effects.^{1,2} Many studies among these tried to find out level of stress in first year of MBBS students.^{3,4} There is need to find out and to compare the stress levels

among different years of MBBS course along with different causative factors which was rarely studied by researchers. So that accordingly suitable measures can be taken to decrease the stress level.

So this study was aimed to compare level of stress in different years of MBBS students. We also tried to find out causes of stress in different year of MBBS students. Complete removal of the stress or stress factors is nearly impossible, but with the knowledge level of stress in different years and causative factors we can introduce timely stress management programmes, counseling, small group discussion along with routine psychological testing of the students. Also various stress relieving activities like college weeks, class picnics and intercollegiate competitions can sometimes play a major role in stress relieving for medical students

MATERIAL AND METHODS

Ethics committee approval was taken to conduct the study. First year students were excluded from the study as per Ethics Committee's suggestion. Medical students from second year to final year of M.B.B.S. course were selected for the study. Any student who has a known psychiatric disorder or taking any antipsychotic, antidepressant drugs were excluded from the study. Students having exam within two months of the day of study were also be excluded to minimize the bias related to exam stress.

The prevalence and level of stress was determined by using the "Kessler Psychological Distress Scale (K10)."⁵ It involves 10 questions with a five level response scale. Depending on the responses marked by the students we can measure the level of psychological distress.

To conduct the study, selected students were called on particular day. They were explained in brief about the study. Written informed consent was taken from each student. Confidentiality and anonymity was maintained about the student's name and academic year.

They were properly instructed about filling of the K10 questionnaire. Additional questions were written on a separate sheet of paper to find out the reasons of stress and distributed to each student. After 20 minutes, questionnaire along with the

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Year of study	Students having stress	Level of stress		
		Mild	Moderate	Severe
Second (first semester)	46.15	58.33	33.33	8.33
Second(third semester)	47.36	51.85	35.18	12.28
Third (first part)	62.19	43.13	33.33	23.52
Final (second part)	85.93	34.54	40	25.45

Table-1: Prevalence and level of stress in different years of MBBS in Percentage

Year of the study	Mean \pm St. deviation	f-value	P-value
Second(first semester)	18.94 \pm 5.96	20.113	< 0.05*
Second(third semester)	19.61 \pm 6.62		
Third (first part)	23.18 \pm 8.14		
Final (second part)	26.92 \pm 7.61		

*P value less than 0.05, statistically significant

Table-2: Comparison of level of stress in different academic year

Comparison among different groups	P < 0.05	Whether difference is significant
4 vs 1	Yes*	significant
4 vs 2	Yes*	significant
4vs 3	Yes*	significant
3 vs 1	Yes*	significant
3 vs 2	Yes*	significant
2 vs 1	no	Not significant

Table-3: Multiple comparison of among different academic year

filled sheet of paper were collected.

Sample size: Total 400 students from different years of M.B.B.S. course of who fulfilled the inclusion criteria were selected for the study. But out of that 338 students were actually participated in the study as follows,

2nd year (first semester) – 78 students

2nd year (third semester)- 114students

3rd year- 82 students

Final year- 64 students

STATISTICAL ANALYSIS

Data was entered in Microsoft Excel and analyzed using the SPSS software (Version 20). Total prevalence and level of stress were calculated as a percentage of total number of students participated. Comparison of level of stress in different academic year was done by Kruskal-Wallis One Way Analysis. Multiple comparison of among different academic year was analysed by Dunn's Method.

DISCUSSION

World Health Organization defines stress as “the reaction people may have when presented with demands and pressures that are not matched to their knowledge and abilities and which challenge their ability to cope”.

Medical students are also not spared with the impact of stress and stress in medical students has been recognized for a long time. A meta-analysis of the American JAMA magazine suggested depressive symptoms in 21 % to 43 % of all medical students.⁶ Day by day stress in medical students is increasing. Increasing stress leads to anxiety disorders, suicidal tendency and many more psychological impacts on medical students those who couldn't cope with this.⁷ Excessive stress in medical students causes sleeping disorders, decreased attention, reduced

concentration, temptation to cheat in exams, increased incidence of errors, and improper behavior socially.⁸ Furthermore, stress in medical students can break the stability of the student's health and can causes headaches, gastrointestinal disorders, coronary heart disease, absenteeism, self-medication, and the consumption of drugs and alcohol.⁷ It is notable that these risks continue throughout the training, also affecting resident physicians particularly with regard to depressive symptoms.⁶ Among German medical students 23.5% showed clinically relevant depressive symptoms.⁹ So this study was conducted to compare the level of stress in different year of MBBS. As per table-1 number of students having stress was maximum in final year and prevalence of stress increases as the course progresses. While comparing level of stress we found that mild stress was common in second and third year but mild and moderate level of stress was common in final year.

As per table-2 while comparing level of stress in different years by Kruskal-Wallis one way analysis it was found that this test was statistically significant ($p < 0.05$). This indicates that one sample stochastically dominates (statistically significant) over other sample, but this test does not identify where and how many pairs of groups this stochastic dominance occurs. So we carried out Dunn's test to analyze the specific sample pairs for stochastic dominance as shown in Table-3.

We found out that the level of stress was more and highly significant in final year as compared with other years as shown in table-3. Level of stress was significant in final year compared to third year, second year (third semester). In third year level of stress is significant compared to second year (third semester) and second year first semester). Similar results were found in study conducted by Dr. A. N. Supre¹⁰ and Dr. Rahul Surve at Aurangabad.¹¹ But interestingly Hamza M.¹ found that level of stress decreases as year of the study increases. This finding is contrary to our study. Level of stress was not statically significant when second year (third semester) compared with second year (first semester), this could not be explained in our study.

We tried to find out the reason of stress by different questionnaire. Different reasons and findings of stressors are as shown in table-4. We found out that lengthy syllabus and busy schedule were the main stressor in second year (first semester), second year (third semester) and third year students. Another causative factor in the same year was, need to meet required attendance.

Reason of stress	Academic year of students			
	Second year (first semester)	Second year (third semester)	Third year (first part)	Final year (second part)
Staying at hostel	23.07	29.82	24.39	23.43
Busy schedule	64.10	43.85	46.34	31.25
Harassment by seniors	01.28	06.14	02.43	00.00
Harassment by teachers	02.56	12.28	09.75	14.06
Fear of teachers	16.66	19.29	14.63	23.43
Need to meet the required attendance	41.02	30.70	29.26	23.43
Financial problems for paying fees, books etc	05.12	12.28	10.97	10.93
Relationship issues	14.10	23.68	19.51	23.43
Tough syllabus	35.89	30.70	36.58	23.43
Lengthy syllabus	60.25	74.56	64.63	39.06
Strong competition between colleagues	24.35	27.19	26.82	06.25
Missing home and parents while at hostel	25.64	30.70	25.60	31.25
Roommate problems while at hostel	10.25	10.52	10.97	07.81
Other reasons:	20.51	25.43	07.31	09.37

Table-4: Reason of stress in different years of MBBS in percentage

Similar results were found in the study conducted by Dr. Rahul Surve, Aurangabad.¹¹ Academic related stress also found to be significant in study done by Dr. A N, Supe.¹⁰ But in final year along with lengthy syllabus and busy schedule, missing home and parents when at hostel play a very important role as a stressor.

From the study it was clear that stress in medical students is increasing and can't be ignored. Various programs should be implemented to reduce the stress burden from the first year. Especially medical council of India should look into the matter to reduce the lengthy syllabus appropriately and introduce some stress management programs in the curriculum. Sometimes small group teaching is also helpful to reduce the stress in medical students. Various studies showed that those students who participate in extracurricular activities have lower states of anxiety than those who are concentrated only on their studies.¹² Some medical schools have made changes such as reducing the workweek, instituting curricular reforms such as having shorter classes and providing psychological services.¹³

CONCLUSION

Level of stress increases as the course of MBBS progresses. Many students are suffering from mild to moderate level of stress. Severely stressed students are also present in different years (though less) they can't be ignored completely as in future it may leads to depressive symptoms. Final year students found to be more stressful than third and second year. Lengthy syllabus and busy schedule are the two important causative factors for stress in different years of MBBS students. All these findings raises an alarm related to stress in medical students and insists for introducing early interventional programs to reduce the stress.

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Assessment of Prevalence and Pattern of Impacted Third Molar among Kathmandu Population: A Retrospective Analysis

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ABSTRACT

Introduction: Impaction refers to failure of eruption of teeth into their proper functional position. Mandibular third molars are the most common tooth to get impacted. One of the commonest reasons for occurrence of third molar impaction is insufficient space which might further lead to various pathologic lesions like pericoronitis. Major theories explaining reasons for occurrence of the tooth impaction also stresses on the concept of discrepancy between the tooth and jaw size. Hence we evaluated the prevalence of impacted third molars and variation occurring in the type of impaction among Kathmandu population.

Material and methods: A total of 893 panoramic radiographs were evaluated retrospectively from March 2010 to June 2015. Complete oro-dental history and demographic details of the patients were obtained and analyzed. For assessing the position of impacted tooth, Winter's classification was used. All the data was analyzed using SPSS software. Pearson Chi-square test was used to measure the level of significance.

Results: We found a total of 893 impacted third molars out of all patient's data examined (p -value <0.05). 80% of the total patients with impacted third molars were males with most of them having mesio-angular type of impacted third molars. Impacted teeth were more common in mandibular arch as compared to maxillary arch (p -value <0.05).

Conclusion: Higher incidence of impacted third molars has been observed in mandibular region as compared to maxillary region. This incidence is higher in males with mesioangular impaction being the most common form of impaction.

Keywords: Impacted, Molar, Prevalence

INTRODUCTION

Failure of eruption of teeth into their proper functional location leads to impaction. The most common tooth to get impacted is mandibular third molar.¹ Insufficient space is the commonest reason for the occurrence of third molar impaction which may further lead to various pathologic conditions like pericoronitis, dental caries or may lead to development of any cystic lesion.^{2,3} Winter's classification system is usually considered for assessing the angle of impacted teeth which evaluates the angle formed between the intersected longitudinal axes of the second and third molars.⁴ For explaining the prevalence and incidence of dental impaction, various theories have been put forward from time to time. Mendelian theory, phylogenic theory and orthodontic theory are among the most dominant and widely accepted theories among all. The concept of discrepancy between the size of the tooth and space available in the jaws due to size variation occurring in the jaws is the most stressed one in all the major theories.⁵ Hence, In this study we evaluated the prevalence of impacted third molars and variation occurring in the type of impaction among Kathmandu population, which

itself is first of its kind in Kathmandu Population.

MATERIAL AND METHODS

This retrospective analysis was planned done by collecting the data from the Kantipur dental college and hospital in Kathmandu from March 2010 to June 2015. All the patients reporting in the dental OPD for removal of impacted third molars whose OPG was done in the college itself were included in the study. Analysis of 1250 panoramic radiographs of the dental patients was done and out of them panoramic radiographs of 893 patients with impacted third molar was selected for the study (Figure-1). The age of the selected subjects varied from 17 years to 48 years. Ethical approval was taken from the ethical committee of the institution before starting the retrospective analysis. Tooth which was not aligned or was not in physiologic occlusal place with other teeth was considered to be impacted. Complete detailed medical, dental, oral and demographic history of the subjects, who were included in the study, was obtained. Complete assessment of the patient's detail was done by two independent observers to avoid any variability in results. Winter's classification was used to divide the impacted teeth on the basis of angulations. Quek et al's⁶ methodology was followed for the measurement of the angulations of impacted teeth. Quek's method classified the impacted teeth into four main types described as follows:

Horizontal impaction: 80° to 100°

Mesioangular impaction: 11° to 79°

Vertical Impaction: 10° to -10°

Distoangular impaction: -11° to -79°.

STATISTICAL ANALYSIS

All the data was analyzed using SPSS software. Pearson Chi-square test was used to measure the level of significance.

RESULTS

Table-1 shows the occurrence of impacted teeth in relation to different age-groups. Out of 893, 505 impacted third molars were observed in the age group of 17-25 years. A decrease in number of impacted tooth was seen with increasing age-groups (Graph-1). A statistically significant results was obtained while comparing the prevalence of impacted teeth with increasing age

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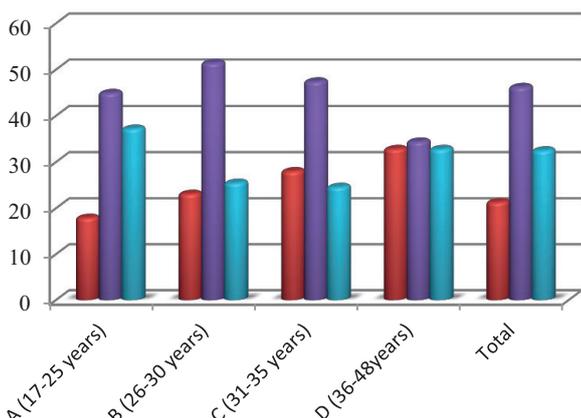
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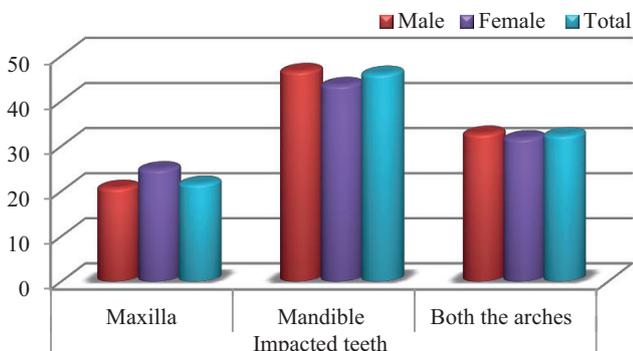


Figure-1: Panoramic radiograph of the patient

■ % age of Impacted teeth Maxilla ■ % age of Impacted teeth Arches
 ■ % age of Impacted teeth Mandible



Graph-1: Distribution of impacted teeth in relation to different age-groups



Graph-2: Distribution of impacted teeth in relation to gender

(p-value<0.05) (Table-2). Table-3 highlights the occurrence of impacted teeth in relation to gender. More number of impacted teeth (n=732) were observed in males. In males, impacted teeth were more common in mandibular arch as compared to maxillary arch (Graph-2). However, the results were statistically non-significant (Table-4).

DISCUSSION

A tooth which is unable to erupt physiologically into its functional anatomic position with time is said to be impacted. Normal age of occurrence of third molars is 18-25 years.⁷ More than one-third of third molars get impacted due to insufficient space. Adverse relation is established between the impacted tooth and the adjacent normally erupted teeth which increase the risk of development of potential complications.⁸ Treatment involving the pathologic and prophylactic extraction of impacted

Age group	Impacted teeth			Total
	Maxilla	Mandible	Both arches	
A (17-25 years)	90 17.9%	227 44.9%	188 37.2%	505 100%
B (26-30 years)	49 23.1%	109 51.4%	54 25.5%	212 100%
C (31-35 years)	33 28.0%	56 47.4%	29 24.6%	118 100%
D (36-48 years)	19 32.8%	20 34.4%	19 32.8%	58 100%
Total	191 21.3%	412 46.2%	290 32.5%	893 100%

Table-1: Occurrence of impacted teeth in relation to different age-groups

Test of Significance	Value	df	p-value
Pearson Chi-square	20.845 (a)	5	0.002 (s)

s: Significant

Table-2: P-value for occurrence of impacted teeth in various age-groups

Gender	Impacted teeth			Total
	Maxilla	Mandible	Both the arches	
Male	152 20.7%	341 46.6%	239 32.7%	732 100%
Female	40 24.8%	70 43.5%	51 31.7%	161 100%
Total	192 21.6%	411 46.0%	290 32.4%	893 100%

Table-3: Occurrence of impacted teeth in relation to gender

Test of Significance	Value	df	p-value
Pearson Chi-square	.748 (a)	3	0.812 (ns)

ns: Non Significant

Table-4: P-value for occurrence of impacted teeth divided on the basis of gender

third molar is the matter of current research.⁷⁻⁹ Impacted teeth can lead to impaction of food, pericoronitis, pain, tenderness etc. Therefore, impacted third molar prophylactic removal is becoming a common practice these days.¹⁰ Hence, we assessed the prevalence of impacted third molars and variation occurring in the type of impaction among Kathmandu population. 893 patients out of total initially assessed had impacted third molars as shown in Table-1 and Graph-1. as far as total impacted percentage was concerned, statistically significant results were obtained as shown in Table-2. Similar results were obtained by Haider et al who observed a prevalence of impacted third molar more than 30% in both males and females.¹¹ Approximately 81% of the total patients in the present study were males (Table-3, Graph-2). however, the results were statistically non-significant (Table-4). Our results were in correlation with the results obtained by Ioannis G et al who also found non-significant gender association with the prevalence of impacted third molar.¹² Prevalence of impacted third molar in our study was found to decrease with the advancing age with highest number of impacted third molar observed in first group. Similar results were obtained by Ioannis et al and Shetty et al who

noticed similar pattern of distribution of impacted third molar with increasing age.^{12,13} Mandibular arch had more number of impacted third molar as compared to maxillary arch (Table-1). Also in both males and females, higher number of impacted teeth was observed in mandibular arch. Mesio-angular and vertical type of impaction was found to be most common type of impaction in mandibular and maxillary arch respectively. Syed et al retrospectively analyzed the prevalence of impacted third molar in Saudi population and from the results observed a higher Incidence of tooth impaction is higher in the mandibular arch as compared to maxilla. They also found a higher incidence of third molar impaction in males with predominant type being the mesio-angular one.⁶ Khawaja et al tried to assess the pathologies associated with impacted third molars. They evaluated panoramic radiographs of 570 patients retrospectively and concluded that removal of impacted third molar should be done prophylactically to avoid future risk of associated pathologies.¹⁴ Schneider et al evaluated the anatomical variations in the position of the impacted mandibular third molar and concluded that the use of 3D imaging is recommended before surgical removal of impacted tooth due to the anatomical variations occurring in them.¹⁵ Bereket et al also retrospectively analyzed the impacted first and second permanent molars in the Turkish population. They evaluated the records of 104,408 patients and choose 170 patients who presented with impacted first and second permanent molar. They found that 91 were male and 79 were females with mean ages 22.69 ± 8.99 years. A total of 200 retained impacted molars were found in their study with 125 molars being vertically impacted and 17 being horizontally impacted, which has similar findings like in our study, They concluded that although impactions are rare in case of first and second permanent molars, early diagnosis is important to start the treatment protocol at optimal time.

CONCLUSION

From the above results, we conclude that higher incidence of impacted third molars occurs in mandibular region as compared to maxillary region. Also, a higher is seen in males with mesioangular impaction being the most common form of impaction. Future research with higher study group, prevalence of impacted third molar among different ethnic communities, variety of parameters are required to further do comprehensive study this field.

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Predictive Value of Transcutaneous Bilirubin Levels in Late Preterm Babies

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ABSTRACT

Introduction: Neonatal hyperbilirubinemia is a frequent cause of readmission in hospital during the neonatal period. The present prospective analytical study was designed to evaluate the incidence, course and risk assessment of jaundice in late preterm infants.

Material and methods: Inborn late preterm infants (post menstrual age of 34 0/7 to 36 6/7 weeks) were observed for significant jaundice till 14 days of birth. Relevant antenatal, natal and postnatal histories were recorded prospectively in a pre-designed Performa. Each baby underwent transcutaneous bilirubin (TcB) measurement twice daily during the 1st 48 hours after birth. TcB measurements and perinatal risk factors were compared between babies who did or did not develop significant jaundice after 48 hours of birth.

Result: 247 late preterm babies were enrolled; out of which 59% developed significant jaundice. Mean gestation was 35.09 ± 0.86 weeks. Incidence of jaundice was higher in lower gestational age groups (p = 0.0078). Large for gestation age, ABO incompatibility and previous sibling with jaundice predicted significant hyperbilirubinemia. Pre-discharge TcB at 24-48 hours was a highly significant predictor variable and was better than clinical risk factors alone for prediction of significant subsequent jaundice.

Conclusion: Late preterm infants have a high incidence of significant jaundice. TcB measurements taken between 24-48 hours can significantly predict whether the baby would develop significant jaundice after 48 hours of life.

Keywords: Late preterm; Significant jaundice; Transcutaneous bilirubin

predictive of subsequent hyperbilirubinemia and readmission.⁵ Several studies are available which have identified risk factors for significant post-discharge jaundice (i.e., requiring phototherapy or exchange transfusion as per hour-specific TSB nomogram of the AAP guidelines) but only a limited few are available which have evaluated the predictors in the late preterm infants. Hence the present study was conceptualized with the aim to evaluate the incidence, course and risk assessment of jaundice in late preterm infants.

MATERIAL AND METHODS

The study was conducted in the post-natal ward at Rohilkhand Medical College and Hospital, Bareilly from November, 2014 to November 2016. All (289) consecutively born late preterm babies, intramural, whether delivered vaginally or by cesarean section, were included in the study. The eligibility criterion was post-menstrual age of 34 0/7 to 36 6/7 weeks. Exclusion criteria were Rh incompatibility, major congenital malformations and sepsis. Gestational age was determined by Modified Ballard's Score and mother's last menstrual period. Relevant antenatal, natal and postnatal histories were recorded prospectively in a pre-designed Performa. In each neonate, TcB measurement was taken twice daily (7 AM – 9 AM and 7 PM – 9 PM). The readings were taken from the forehead using transcutaneous bilirubinometer (Bilichek-HHU, Respironics). Whenever the neonate appeared jaundiced or when the TcB was > 12 mg/dL, TSB was performed. TSB was calculated from the capillary sample using spectrophotometer (Unibeam). The decision to treat jaundice was based on the TSB levels. Neonates with significant jaundice were started on phototherapy as per the AAP guidelines.⁴ Infants with gestation 34 weeks and SGA infants were started on phototherapy at TSB levels 1mg/dL less than the treatment threshold on the AAP charts (this methodology was adopted from the study of Lavanya et al⁵). Babies discharged from the hospital were regularly followed in the outpatient clinic till day 14 of life or till appearance of significant jaundice. Study approval was taken from the Institute's Ethics Committee. Informed consent was taken from parents of every baby. Based on the hour of measurement, the TcB measurements were grouped into TcB 0-12 hours, TcB 13-24 hours, TcB 25-36 hours and TcB 37-48 hours. The clinical risk factors and the grouped

INTRODUCTION

Neonatal hyperbilirubinemia affects nearly 84% of term newborns¹ and is the most common cause of hospital readmission during neonatal period.² Severe jaundice is rare (< 2%) but can lead to kernicterus and permanent neuro-developmental delay.² Neonatal hyperbilirubinemia is usually detected by the presence of icterus, but this approach can be quite unreliable especially in the first 24-48 hours when the total serum bilirubin (TSB) may be too low to be visualized consistently.³ Transcutaneous bilirubinometry is becoming increasingly acceptable primarily because of convenience and non-invasive nature of its application. Modern day limitations have necessitated shortened stay in hospital for both mother and neonate, thereby reducing the time for hospital based professional assessment of infant feeding and detection of jaundice.⁴ According to 2004 American Association of Pediatrics (AAP) clinical practice guidelines on the management of neonatal hyperbilirubinemia, 2004, combining of pre-discharge hour-specific nomogram measurements of total serum bilirubin (TSB) or transcutaneous bilirubinometry (TcB) along with risk factors such as lower gestational age and exclusive breast feeding are considered most

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TcB measurements were compared between infants with and without significant jaundice after 48 hours of life.

STATISTICAL ANALYSIS

SPSS version 21 was used for the analysis. Descriptive statistics and chi-square test were used to interpret results. Continuous variables were presented as mean \pm SD and categorical variables as frequencies and percentages.

RESULTS

Two hundred eighty nine late preterm infants were born in the hospital during the study period, of which 247 were enrolled for the study. The male female ratio was 1.54:1. Two hundred and thirty four infants were followed till onset of significant jaundice or till day 14 of life (Figure-1). The mean gestation age was 35.09 ± 0.86 weeks and mean weight was 2289 ± 512 gms. Fifty four (23.07%), 79 (33.76%) and 101 (43.16%) neonates were of gestation ages 34, 35, and 36 weeks respectively. Twenty three (9.83%) neonates were small for age (SGA) and 18 (7.69%) were large for gestation age (LGA). Three (1.28%) infants were born of twin delivery. One hundred thirty nine neonates (59%) developed significant jaundice. The incidence of jaundice was highest at 34 weeks (68.52%), followed by 65.82% at 35 weeks and 49.5% at 36 weeks of gestation. ($p = 0.0078$). Mean duration of onset of significant jaundice was 54 ± 29 hours. Infants developing significant jaundice within first

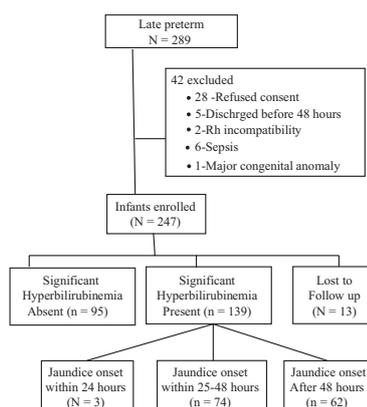


Figure-1: Enrollment and follow up of study subjects

24 hours were 1.21%; 29.96% infants between 25-48 hours and 25.1% infants after 48 hours of life.

The mean duration of phototherapy required was 52 ± 28 hours. The mean peak TSB was $14.8 \text{ mg/dL} \pm 2.8$; 45% of the jaundiced infants had TSB $> 15 \text{ mg/dL}$. In neonates who developed significant jaundice after 48 hours, the mean age of onset was 75 ± 26 hours, mean peak TSB was $14.6 \pm 2.6 \text{ mg/dL}$ and mean duration of phototherapy was 44 ± 21 hours.

Following risk factors were seen to be significantly associated with neonates who developed significant jaundice: ABO incompatibility, lower gestational age (34 and 35 weeks), LGA, history of jaundice in previous sibling and birth trauma (Table-1). The median TcB values were 1.4 mg/dL , 3.8 mg/dL , 6 mg/dL and 7.7 mg/dL at 0-12 hours, 13-24 hours, 25-36 hours and 37-48 hours of life, respectively. The mean TcB values at 13-24 hours were significantly higher in infants developing significant jaundice between 24-48 hours as compared to those developing after 48 hours ($4.8 \pm 2.1 \text{ mg/dL}$ vs. $4.0 \pm 1.9 \text{ mg/dL}$ ($p = 0.0224$).

Critical TcB levels, at 12-24 hours and 24-48 hours, of > 4.6 and $> 7.4 \text{ mg/dL}$ cut-off value respectively were selected based on sensitivity, specificity, positive predictive value and negative predictive value as shown in Table-2.

DISCUSSION

Hyperbilirubinemia is a common neonatal problem. Concern about neonatal hyperbilirubinemia is imperative, given the inherent risk of subsequent development of kernicterus. Newborns are physiologically predisposed to developing icterus and the risk is further compounded by prematurity. Over the years, several studies have been conducted to identify predictors of neonatal hyperbilirubinemia with the aim to limit unnecessary hospital stay and also to identify babies at risk for developing significant jaundice.

Out of the 234 late preterms enrolled for the study, 59% developed significant jaundice. This reiterates the fact that these infants need to be closely monitored for early recognition of jaundice. Similar incidence have been reported by other studies from India,^{6,7} whereas another study conducted in term and near term infants reflected an incidence of 26%.⁸ The higher

Variable	Significant hyperbilirubinemia		p value
	Absent (n = 95)	Present (n = 62)	
Birth weight (gms)*	2349 \pm 468	2368 \pm 590	NS (p = 0.8230)
Gestation (wks)*	35.38 \pm 0.69	35.22 \pm 0.65	§
Males	50 (52.63)	35 (56.45)	NS (p = 0.6387)
SGA	6 (6.32)	8 (12.9)	NS (p = 1568)
LGA	4 (4.21)	12 (19.35)	HS (p = 0.0022)
ABO incompatibility	2 (2.11)	7 (11.29)	S (p = 0.0385)
Sibling jaundice	0 (0)	5 (8.06)	S (p = 0.0189)
Maternal oxytocin	4 (4.21)	6 (9.68)	NS (p = 2998)
Birth trauma	0 (0)	1 (1.61)	NS (p = 0.8292)
Exclusive breastfeeding	64 (67.37)	35 (56.45)	NS (p = 0.2293)
Stools/d**	2 (1-3)	2 (1-3)	NS (p = 0.9343)
Meconium passage (in d)**	2 (1-5)	2 (1-4)	NS (p = 0.9343)
TcB $> 7.4 \text{ mg/dL}$ at 24-48 hours (n=71)	13 (18.31)	58 (81.69)	ES (p $<$ 0.0001)

*Mean \pm SD; numbers in parenthesis are percentages; ** values in median (range); NS = not significant; S = significant (p $<$ 0.01); HS = highly significant (p $<$ 0.001); ES = extremely significant (p $<$ 0.0001); § = p value between incidence at 34 wks and 36 wks; HS; p value between incidence at 35 wks and 36 wks; HS

Table-1: Risk Factors in Neonates With or Without Significant Jaundice Onset after 48 Hours

Variable	Sensitivity	Specificity	Positive predictive value	Negative predictive value
TcB level at 12-24 hours > 4.6 mg/dL	83.09%	87.37%	90.4%	78.3%
TcB levels at 24-48 hours > 7.4 mg/dL	93.55%	82.11%	81.69%	95.35%

Table-2: Sensitivity, specificity, positive predictive value and negative predictive values of TcB levels for prediction of hyperbilirubinemia

incidence in our study as compared to study by Sarici et al⁸ may be due to inclusion of infants of 34 weeks gestation. Another retrospective study done on well babies showed that infants of gestation age \leq 36 weeks, 36 1/7 weeks to 37 weeks, 37 1/7 weeks to 38 weeks had an odds ratio of 13.2, 7.7 and 7.2, respectively of developing significant jaundice as compared to babies > 40 weeks.⁵ Similarly in our study, the incidence of developing significant jaundice was highest in babies of 34 to 35 weeks gestation as compared to babies of 36 weeks gestation ($p = 0.0078$). The higher incidence of significant jaundice in late preterms is due to poor ligandin uptake of bilirubin by hepatocyte and decreased uridine diphosphate glucuronyl transferase (UDPGT 1A) activity in preterms.^{9,10} Similar to other studies,¹⁰⁻¹² our study showed no significant relation between sex of the infant and development of significant hyperbilirubinemia. In contrast few researchers^{13,14} reported male gender as a risk factor for jaundice.

In our study, assessment of pre-discharge risk factors showed that lower gestation age (34 and 35 weeks), large for gestation age (LGA), ABO incompatibility and previous sibling with jaundice were the clinical variables that were significantly associated with significant hyperbilirubinemia. Similar findings have been reported earlier.^{6,7,15,16}

Pre-discharge TcB at 24-48 hours was a highly significant predictor variable and was better than clinical risk factors alone for prediction of significant subsequent jaundice. Negative predictive value of 95.35% shows that measurement of TcB at 24-48 hours can very efficiently predict the risk of subsequent jaundice. Similar observations were reported by Lavanya et al.⁶ In a prospective cohort study, Keren et al found that combining pre-discharge TcB measurements along with gestational age improved the accuracy of prediction of subsequent jaundice.¹⁷ Since more than 50% of late preterm babies are at risk of developing significant jaundice, pre-discharge TcB levels should be routinely performed to decide which babies require delayed discharge or early follow-up for neonatal hyperbilirubinemia.¹⁸

CONCLUSION

Late preterm infants have a high incidence of significant jaundice. TcB measurements taken between 24-48 hours can significantly predict whether the baby would develop significant jaundice after 48 hours of life.

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Fine Needle Aspiration Cytology and CD4 Count Estimation in HIV Positive Patients with Lymphadenopathy

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ABSTRACT

Introduction: Lymphadenopathy is among the earliest manifestation of many opportunistic infections and malignancy. Hence there is a need for simple investigations like FNAC for evaluation of HIV lymphadenopathy. This study was undertaken to analyze the cytological patterns of lymph node lesions in HIV/AIDS patients.

Material and Methods: In this study a total of 660 patients with lymphadenopathy were included of which 597 were HIV negative and 63 were HIV positive. Lymph node aspirates were stained with Giemsa and Ziehl Neilsen stains. CD4 count were recorded. Tubercular lymphadenitis was further categorized. Acid-fast bacilli grading was done on Z-N positive smears. Each lesion was compared with CD4 count.

Results: There was increased prevalence of tubercular lymphadenitis in HIV positive patients. The most common opportunistic infection was tuberculosis. The maximum number of HIV negative patients were in the age range of 10-19 years, while 20-29 years of age group was the major group in HIV positive patients. Epithelioid cell granuloma with caseous necrosis was the commonest cytological picture in HIV positive patients, 37% show AFB positivity with 2/3 cases had grade IVAFB positivity. Maximum number of patients were found with CD4 count range of 201-300cells/ μ l.

Conclusion: Lymph node cytology was found to be a useful tool in lymphadenopathy cases for identification of opportunistic infection, non neoplastic and neoplastic lesions. Comparison of these lesions with CD4 count and AFB grading reflects immunity and disease activity aiding better treatment.

Keywords: lymphadenopathy, CD4 count, HIV patients

INTRODUCTION

The Human immunodeficiency virus (HIV) infection leading to acquired Immuno Deficiency syndrome (AIDS) is considered to be one of the major public health problem. According to UNAIDS report on the global AIDS epidemic (2012) 34 million people are living with HIV.¹

AIDS was first recognized in US in 1981. In 1983, HIV virus was isolated from lymphnode and in 1984, this virus was demonstrated to be causative agent of AIDS. In India first AIDS case was reported in a transfusion recipient in 1986. There are 2.39 million people with AIDS/HIV in India.²

With the identification of HIV is 1983, as a causative agent of AIDS, the CDC classified HIV infected individuals on the basis of clinical conditions associated with HIV infection and CD4 count.

Using this system, any HIV infected individual with a CD4+ cell count <200 cells/ μ l has AIDS by definition regardless of presence of symptoms or opportunistic disease.

Many individuals with primary HIV infection many have generalized lymphadenopathy. Lymphnode is most favoured site for initial infection during disease progression.^{3,4} All the lymphnodes can be easily sampled by the needle aspiration,⁵ Which can be further used for other ancillary studies.⁶

This study was performed with the aim to know the prevalence of different opportunistic infections in HIV/AIDS patients in comparison to general population, to study the frequency of TB in HIV/AIDS patients in comparison to other infection, to study CD4 count in HIV positive patients with lymphadenopathy and to find out correlation of different infections with CD4 count.

MATERIAL AND METHODS

The study was a prospective study conducted with study period from June 2014 to May 2015. A total of 660 patients with lymphadenopathy were included (based on inclusion and exclusion criteria), out of which 597 were of HIV negative and 63 patients were HIV positive, in the Department of Pathology, LLRM Medical College, Meerut. Prior to the study ethical clearance and informed consent were taken.

Inclusion criteria

1. Patients with lymphadenopathy of more than 1 cm size.
2. Patients of all age group and sex were included.

Exclusion criteria

1. Unwilling patients
2. Uncooperative patients

A detailed clinical history and clinical examination was conducted in all cases. Fine needle aspiration of lymph node with 22 bore needle and 20ml syringe was done to detect the cause of lymphadenopathy.

Following features were noted: -

1. *Type of aspirate* – Cheesy, Pus, Blood mixed, Nonspecific
2. *Cytomorphological features on Giemsa stain*
 - a. Epithelioid cells / epithelioid cell granuloma+ caseous necrosis
 - b. Caseous necrosis only
 - c. Acute and / or chronic inflammatory exudate + caseous necrosis
 - d. Any combination of a+b+c
3. *Zn stain for AFB positivity* – (Ananthanarayan and Paniker's microbiology-7th edition) AFB reporting was done
4. Culture and sensitivity were performed wherever necessary.
5. *CD4 count estimation:* Diagnosis of HIV was done by ELISA test followed by CD4 counts by BD FACS count system.⁷ Blood collected in K2 EDTA vacutainer tube. The BD FACS count system used for enumerating absolute lymphocyte counts (cells/ μ l whole blood) of CD3+T lymphocytes and CD4+T lymphocytes. % CD count is

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calculated by using the following formula. % CD4 count = $\frac{\text{Absolute CD4+T lymphocyte count}}{\text{Total Lymphocyte Count}}$

Absolute CD4+ T lymphocyte count: as obtained by the BD FACs count.

Total lymphocyte count can be obtained by a cell counter or alternatively obtained using the following formula.

Total lymphocyte count = $\frac{\text{Total number of lymphocytes (DLC)}}{100} \times \text{Total leucocyte count}$

STATISTICAL ANALYSIS

For data analysis, we used Statistical Package for the Social Sciences (SPSS) version 10. Age, gender, site of FNAC and cytomorphological patterns were expressed as frequency and percentage. Significance was estimated by chi square test.

RESULTS

The study was conducted with study period from June 2014 to May 2015 on 660 patients with lymphadenopathy, out of which 597 were of HIV negative and 63 patients were HIV positive, in the Department of Pathology, LLRM Medical College, Meerut.

Distribution of HIV positive / HIV negative patients with Lymphadenopathy according to age group

HIV negative patients were found in the age group of 1-89 years, whereas HIV positive patients were found in the age group of 1-69 years. For HIV negative group, maximum number of cases 165 (27.64%) were of 10-19 years and minimum number of patients 4 (0.67%) were of 80-89 years. For HIV positive group, maximum number of cases 26 (41.27%) were of 20-29 years and minimum number of patients 24 (38.10%) were of 30-39 years.

Distribution of HIV positive patients with lymphadenopathy according to site involved

In HIV positive group, most common site involved was cervical (42, 66.66%), followed by axillary(8, 12.70%), submandibular (5, 94%), post auricular (4, 6.35%), supraclavicular (3, 4.76%) and inguinal lymph nodes (1, 1.59%).

Distribution of HIV positive and negative patients with Lymphadenopathy according to diagnosis

Out of HIV positive patients, maximum cases (40/63) were of tubercular lymphadenitis followed by reactive hyperplasia (8/63), granulomatous lymphadenitis (8/63), pyogenic lymphadenitis (4/63) and lymphoma (1/63). Out of HIV negative patients, maximum cases (205/597) were of tubercular lymphadenitis followed by reactive hyperplasia (194/597), granulomatous lymphadenitis (75/597), lymphoma/malignancy (75/597) and pyogenic lymphadenitis (22/597).

Cytomorphological patterns of tubercular lymphadenitis in HIV patients

Out of 40 HIV positive patients with of tubercular lymphadenitis, most common Cytomorphological patterns observed was Epithelioid cell granuloma + caseousnecrosis (20,50%) followed by Epithelioid cell granuloma +caseous necrosis + acute/on chronic inflammation (10, 25%), Caseous necrosis + Acute/on chronic inflammation (7,17.5%), and Caseous necrosis (3,7.50%). Only 15 patients showed AFB positivity (Table-1).

Distribution of HIV positive patients with Lymphadenopathy according to sex and CD4 count

In this study, 48 male patients and 15 female patients. Maximum number of male patients (12) were seen in CD4 count range of 201-300/l and maximum number of female patients (9) were also seen in CD4 count range of 201-300/μl (Table-2)

CD4 count range in different Cytomorphological findings

Maximum number of TBLN (11), RHLN (5) Granulomatous (2) Pyogenic (2) were in CD4 count range of 201-300/l. One patient of NHL was in CD4 count range of <100/μl (Table-3).

Distribution of CD4 count in different Cytomorphological types of TBLN

In our study, total number of patients showing Epithelioid cell granuloma +Caseousnecrosis are 20 in which maximum number of 6 patients were inCD4 count range of <100/μl. total number of patients showing Epithelioid cell granuloma +Caseous necrosis and acute / on chronic inflammation are 10 in which maximum number of 4 patients were in CD4 count range of 201-300/μl and total number of patients showing Caseous necrosis and acute/on chronic inflammation are 7 in with maximum number

Cytomorphological features	No. of patients	Percentage
Epithelioid cell granuloma +caseous necrosis	20	50
Caseous necrosis + Acute / on chronic inflammation	7	17.5
Epithelioid cell granuloma +caseous necrosis + acute / on chronic inflammation	10	25
Caseous necrosis	3	7.50
AFB positivity	15	37.5

Table-1: Cytomorphological patterns of tubercular lymphadenitis in HIV patients

CD4 count range cells/μl	No. of patients	Male	Female	Percentage
<100	13	11	2	20.63
101-200	11	10	1	17.46
201-300	21	12	9	33.33
301-400	8	6	2	12.70
401-500	5	4	1	7.94
601-600	1	1	-	1.59
601-700	2	2	-	3.17
701-800	1	1	-	1.59
801-900	1	1	-	1.59
Total	63	48	15	100

Table-2: Distribution of HIV positive patients with Lymphadenopathy according to sex and CD4 count.

of 3 patients were in CD4 count range of 100-200/μl (Table-4).

Distribution of HIV positive patients according to mean CD4 count and disease

In our study, mean CD4 count in TBLN patients was 232.03/μl, whereas in RHLN mean CD4 count was 249.25/μl, and in pyogenic lymphadenitis mean CD4 count was 265.25/μl, in Granulomatous 376/μl One patient of NHL WAS with CD4 count 76/μl.2 cases show no opinion with CD4 count 165.5/μl.

DISCUSSION

Human immunodeficiency virus (HIV) belonging to subject of retroviruses called lentivirus is the causal agent of AIDS.

Lymphadenopathy is described in 75% of reported cases of HIV syndrome. In this study, 660 patients with Lymphadenopathy were taken, out of which 597 were HIV negative and 63 were HIV positive.

Out of HIV positive group, age group of 20-29 yrs. was most commonly involved (41.27%) followed by 30-39 years (38.14%) while in HIV negative group, age group of 10-19 years was most commonly involved (27.64%) followed by 20-29 years (23.95%). This study was similar to Vanisri et al⁸ (44.4%), Neelima et al⁹ (76% between 21-40 yrs) and Deshmukh et al¹⁰ (36+45.4 = 81.7%) between 21-40 yrs.

According to site, most common site was cervical lymph node (66.66%) followed by axillary and Submandibular group of lymph nodes (12.7% and 7.94% respectively). This is similar to studies by others.^{9,10}

Most common cytological diagnosis was tubercular lymphadenitis (40, 63-49%) followed by granulomatous (12.70%) and reactive lymphadenitis (12.7%) respectively in

HIV positive patients.⁸⁻¹¹ Most common cytomorphological pattern and HIV positivity in our study was epithelioid cell granuloma + caseous necrosis (20,50%) and 15 (37.5%) which is similar to other studies (Deshmukh,¹⁰ 40% Neelima⁹ 51.85%, Vanisri 7.6% Satyanarayana.¹²

In our study of 63 HIV positive patients highest CD4 count range was observed in pyogenic lymphadenitis (265.25/μl) followed by reactive (249.25 cases/μl), tubercular (232.02) and malignant (76/μl). While other studies show highest CD4 count in reactive lymphadenitis.^{9,12-14}

Chi-square test was used to find out statistical significance of tubercular lymphadenitis in HIV positive patient in comparison to HIV negative patients. This indicated that increase in prevalence of tuberculosis in HIV positive patients with lymphadenitis in comparison to HIV negative patients is highly statistically significant (<0.001).

CONCLUSION

There was increased prevalence of tubercular lymphadenitis in HIV positive patients which was statistically significant. The most common opportunistic infection was tuberculosis. The maximum number of HIV negative patients were in the age range of 10-19 years, while 20-29 years of age group was the major group in HIV positive patients. Epithelioid cell granuloma with caseous necrosis was the commonest cytological picture in HIV positive patients, 37% show AFB positivity with 2/3 cases had grade iv AFB positivity. Maximum number of patients were found with CD4 count range of 201-300cells/μl. Correlation of CD4 counts provides information about the immune status and stage of the disease. Thus FNAC is an effective diagnostic modality for HIV positive lymphadenopathy patients and helps

CD4 count (cells/μl)	Diseases						
	TBLN	RHLN	Gran LN	Pyo LN	NHL	No opinion	Total
<100	10	1	1	-	1	-	13
101-200	8	-	1	1	-	1	11
201-300	11	5	2	2	-	1	21
301-400	6	1	1	-	-	-	8
401-500	2	1	1	1	-	-	8
501-600	1	-	-	-	-	-	1
601-700	1	-	1	-	-	-	2
701-800	1	-	-	-	-	-	1
801-900	-	-	1	-	-	-	1
Total	40	8	8	4	1	-	63

TBLN: Tubercular lymphadenitis, RHLN: Reactivelymphadenitis, Gra. LN: Granulomatouslymphadenitis, Pyo. LN: Pyogenic lymphadenitis, NHL: Non Hodgkin's Lymphoma

Table-3: CD4 count range in different Cytomorphological findings

CD4 Count Cells/ μl	Cytomorphology				
	ECG+CN	ECG+CN +A/on ch. inf.	CN+A/on C. inf.	CN only	Total
<100	6	-	2	1	10
101-200	5	-	2	1	8
201-300	5	4	1	1	11
301-400	3	3	-	-	6
401-500	1	1	-	-	2
501-600	-	-	1	-	1
601-700	-	1	-	-	1
701-800	-	1	-	-	1
801-900	-	-	-	-	-
Total	20	10	7	3	40

ECG- Epithelioid cell granuloma CN= Caseous necrosis A/on C. inf. = Acute / on chronic inflammation

Table-4: Distribution of CD4 count in different Cytomorphological types of TBLN

in identifying majority of the reactive and neoplastic lesions and guides for the subsequent management of the patient.

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Study of Clinico-etiological Profile and the Complication Pattern in Patients with Chronic Liver Disease at Tertiary Care Centre

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ABSTRACT

Introduction: Knowledge of etiology, mode of clinical presentation and pattern of development of complications of chronic liver disease will help in designing optimal and cost effective control measures of the disease. The present study was performed to find out etiology, mode of clinical presentation and pattern of development of complications in patients of chronic liver disease.

Material and Methods: The study included 62 patients suggestive of chronic liver disease, attending gastroenterology OPD, and those admitted in medicine department of M.Y. Hospital, Indore. Detailed history, physical examination, clinical examination, abdominal ultrasound examination, Child-Pugh score and liver biopsy were performed.

Results: In present study, 54.8% patients belonged to age group of 20 to 40 years, 87.1% patients had history of abdominal distension, 69.4% had jaundice and 48.4% had history of gastrointestinal bleeding. As clinical sign of hepatic failure and portal hypertension, loss of body hair and splenomegaly was reported in 41.9% and 41.9% patients respectively.

Conclusion: As per the present study data, CLD was a common entity in Central India with male preponderance and affecting mostly people of middle age group, which required immediate social and medical intervention.

Keywords: chronic liver disease, child Pugh's scoring, abdominal distension, jaundice, gastrointestinal bleeding

disease (CLD), fulfilling the inclusion criteria and attending Gastroenterology OPD or were admitted in Medicine department of M.Y. Hospital, Indore.

A written informed consent from all the patients and Ethical Committee approval was obtained before starting the study.

Detailed history of patients along with assessment of risk factors known to be associated with CLD was recorded. Assessment of risk factors included family history to rule out hemochromatosis, Wilson's disease, α 1-antitrypsin deficiency, cystic fibrosis, history of excessive alcohol consumption (60-80 gm alcohol per day for men, 40-60 gm per day for female for 10 years or more), hyperlipidemia, diabetes mellitus, obesity, previous blood transfusion and parenteral exposure for chronic hepatitis B or hepatitis C and risk factors for autoimmune hepatitis and primary sclerosing cholangitis.

A detailed physical examination was done, specifically for finding the manifestations of liver disease which could result from loss of hepatocyte mass, bile duct obstruction or development of portal hypertension.

Patients with jaundice, due to increase in serum bilirubin, small liver or a liver of nodular contour due to established cirrhosis, gynaecomastia, testicular atrophy, palmar erythema and spider angioma were included.

Features suggestive of liver fibrosis and portal hypertension like ascites, edema, hypersplenism, portal systemic shunting resulting in distended superficial and periumbilical (caput medusa) abdominal veins, were taken into consideration at the time of physical examination. Upper GI endoscopy was done to see oesophageal varices and portal hypertensive gastropathy. Specific manifestation like Dupuytren's contracture in chronic alcoholics and Kayser-Fleischer rings in Wilson's disease were also searched for.

After detailed clinical examination biochemical and hematological examinations were done to evaluate liver function.

Apart from these, hepatitis B surface antigen (HBsAg) was done for chronic hepatitis B infection. Those patients who were not alcoholic, and HBsAg was negative but clinical examination and laboratory tests were favoring CLD, were subjected to other laboratory investigations like anti-HCV (for chronic hepatitis C infection), ANA, AMA, serum ceruloplasmin level, serum ferritin and α 1-antitrypsin to find out etiology.

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INTRODUCTION

Different study based on Indian data on several clinical aspects of chronic liver disease (CLD) like etiology, natural history, clinical presentation, treatment recommendations and its effect of public health.¹⁻³ But its trend and burden to different morbidity and mortality have never obtained seriousness as in other developed countries.³⁻⁵

Examining the trend of the disease over a time period becomes an important tool to observe the variation of its different aspect and provide the status of country's public health system.⁶⁻⁷

Getting the knowledge of exact disease burden of the country assist in cost effective and optimal use of control measures taken by the government of that country and it also provide the disease scenario particularly in low resource country like India.⁷

This is the reason, when there is a lack of such data; government has failed to develop effective policies which can help the patients to get rid of the disease such as optimal use of liver transplant.⁷

The present study was done to find out etiology, mode of clinical presentation and pattern of development of complications in patients of chronic liver disease.

MATERIAL AND METHODS

A hospital based study was done including 62 patients who presented with sign and symptoms suggestive of chronic liver

Liver biopsy was done in 8 patients. This included 2 patients who had SOL in liver with evidence of distant metastasis. Biopsy was done to prove that malignancy was of hepatic origin. Other six patients were those in whom minimal clinical and biochemical evidence of chronic liver disease was present, or where etiology was not definite. Once biopsy proved chronic hepatitis and/or cirrhosis in them they were included in our study.

Patients were also evaluated by abdominal ultrasound examination and where necessary Doppler flow studies were done.

The clinical findings were used in association with laboratory studies to calculate Child-Pugh Score.

The Child-Pugh score is calculated by adding the score of the five factors (ascites, bilirubin, albumin, prothrombin time and encephalopathy) and can range from 5 to 15. Child Pugh class is either A (a score of 5-6), B (7 to 9) or C (10 or above). Decompensation indicates cirrhosis with a Child-Pugh score of 7 or more (Class B and C).

Follow-up of the patients was done in Gastroenterology OPD throughout the study period of 1 year and their symptomatic response to treatment was noted. Whenever patients developed decompensation and complications meriting admission in hospital, they were admitted in the hospital and further work-up was done.

STATISTICAL ANALYSIS

All the data were analyzed using IBM SPSS- ver.20 software. Analysis was performed using chi-square test and independent sample student t test. P values <0.05 was considered to be significant.

RESULTS

In present study, most of the patients [34 (54.8%)] belong to age group of 20 to 40 years followed by 21 (33.9%) who were between the age group of 41-60 years. Out of 62 patients, there were 50 (83.33%) males and 12 (19.37%) females. The distribution of different characteristic of patients (history and clinical sign) was shown in the table-1.

Out of 60 patients whose serum alanine aminotransferase (ALT) and aspartate aminotransferase (AST) level was measured, 42 (70%) had abnormal ALT and 34 (56.7%) patients had abnormal AST.

Out of 58 patients whose serum albumin was measured, 25 (43%) had serum albumin level less than 3 gm/dL, while 21 (36.2%) had in between 3 to 3.5 gm/dL together constituting 79.3% who had defective synthetic function. Twelve (20.7%) patients, however, had normal synthetic function with serum albumin levels more than 3.5 gm/dL.

Out of 60 patients, 12 (20%) had severely compromised function with PT of patient more than 6 second longer than control value, 27 (45%) patients PT was 3-6 seconds longer than control value and 21 (35%) patients had PT within normal variation, i.e. PT (patient) – PT (control) < 3 seconds.

Out of 61 patients, 35 (57.4%) patients had serum bilirubin values less than 2 mg/dL, 10 (16.4%) had value in between 2 to 3 mg/dL and 16 (26.2%) patients had values more than 3 mg/dL. Out of 60 patients whose child Pugh's scoring was done, most of the patients had presented in advanced liver disease, 23

Parameters		N (%) (n=62)
History	Abdominal distension (ascites)	54 (87.1)
	Jaundice	43 (69.4)
	Gastrointestinal bleeding	30 (48.4)
	Peripheral edema	29 (46.8)
	Encephalopathy	15 (24.2)
	Decreased appetite	30 (48.4)
Clinical signs*	Loss of body hair	26 (41.9)
	Splenomegaly	26 (41.9),
	Spider angioma	21 (33.9),
	Parotid enlargement	11 (17.7)
	Gynaecomastia	10 (16.1%)
Data is expressed as number of patients (%), *Clinical signs of hepatic failure and portal hypertension other than ascites		
Table-1: Distribution of different characteristic of patients		

(38.33%) presenting in Class C and 26 (43.33%) presenting in Class B. Only 11 (18.33%) patients presenting in Class A child Pugh score.

Platelet count was done in 45 patients, 14 (31.1%) of patients had platelet less than 100,000 per microliter while 31 (68.9%) had platelets more than 1 lakh per microliter.

Out of 43 patients whose upper GI endoscopic evaluation was done, 37 (86%) had esophageal varices, 14 (32.6%) had portal hypertension gastropathy also and 6 (14%) had normal upper GI endoscopic study.

Out of 62 patients of CLD, chronic alcohol ingestion [24 (38.7%)] was the most common etiology followed by chronic hepatitis B infection [17 (27.4%)]. Four (6.5%) patients had chronic hepatitis B and had history of long-term alcohol intake. Two (3.2%) patients had chronic hepatitis C infection, 3 (4.8%) had Wilson's disease and 1(1.6%) had Budd Chiari Syndrome. Eleven (17.7%) patients were such whose etiology of CLD could not be determined.

DISCUSSION

Our study, a hospital based study where most of the patient are from low socioeconomic status, was an endeavor not only to search the mode of presentation of patients with CLD but also to find out their etiology in our region.

Male predominance (80.6%) was observed in present study and most of the patients (88.7%) were of middle age group, which is similar to the study done by Pal et al at Kolkata where 79% of patients were male and 54% of patients belonged to age group 31 to 50 years indicating that CLD is more common in male suggesting high risk of exposure to causative factors.⁸

Mode of presentation of patients with chronic liver disease was an important consideration taken in our study. Pal et al has reported ascites in 52% of patients followed by jaundice in 40% and GI bleeding in 24%, which is almost similar to the findings of present study.⁸ Thus in central India patients were presenting with rather more frank symptoms of CLD.

The etiology of chronic liver disease was an arena where much difference was noted in our study from those of Western Countries. In a large multicenter study done by Stroffoline et al searching for the etiology of chronic hepatitis in Italy studied 6210 patients consecutively admitted to 79 hospitals throughout Italy. They found chronic hepatitis C (62.6%) as most common etiological factor, chronic hepatitis B in 9.2% and history of

alcohol abuse was present in 19.2% of cases, but only 5.2% cases were without viral infection and had only alcohol abuse.⁹ Almost similar etiological profile was seen in present study.

Velosa et al from Portugal in a study of 988 patients of CLD, found viral etiology in 82%, metabolic in 2%, biliary in 2%, alcoholic in 11%, autoimmune in 1.5%, and idiopathic in 2%. Among viral group, hepatitis B virus infection in 65%, hepatitis C in 26% and hepatitis D was found in 8%.¹⁰

Khokhar from Islamabad in a study of 518 patients of CLD, biopsy proven chronic hepatitis was present in 354 patients. Out of these 86% had hepatitis C, 10.7% hepatitis B, 3.1% had both B and C.¹¹ Similarly a study of 44 patients by Acharya et al at AIIMS, New Delhi found 50% of patients had chronic Hepatitis B, associated hepatitis D with hepatitis B in 21%, hepatitis C in 15%, non-A, non-B other than Hepatitis C virus in 13%. 2% patients had autoimmune hepatitis B.¹²

The present study data showed that alcohol is the most common culprit for CLD in Central India. Further studies will be needed to establish what cause is; high susceptibility of study population to alcohol, high risk behaviour of the population, or both for getting advanced CLD due to alcohol in Central India.

Upper GI endoscopic evaluation study done by Pal J et al found 78% had esophageal varices and 13% had portal hypertensive gastropathy.⁸ Dangwal TR et al found 13 out of 29 children with CLD subjected to upper GI endoscopy had esophageal and/or gastric varices.¹³ Almost similar findings were found in the present study.

Laboratory results of serum aminotransferase levels showed elevated levels, signifying ongoing injury. Aspartate aminotransferase level was found to be elevated in less number of patients in comparison to ALT level.

Acharya et al had found hypoalbuminemia in more than half of the patients they studied.¹² In our study hypoalbuminemia (serum albumin level less than 3.5 g/dL) was seen in 79.31% patients whose serum albumin was measured (61 patients). This signifies that patients of CLD are reporting to physicians at late stages of the disease, when most of reserve capacity of the liver has been damaged and patients had been asymptomatic up to late stage. Similarly prothrombin time, another measure of synthetic function of liver was deranged in 65% of patients and 68.9% patients had platelet count more than 1 lakh. It was expected that after development of cirrhosis and splenomegaly, platelet count should decrease to levels below 1 lakh. Only 31.1% of our patients had platelet count in this range.

Child-Pugh Score and class, a marker of extent of liver damage was evaluated. In a study of 91 patients Pal et al found 51% of patients belonged to Child-Pugh Class B followed by class C in 35% and only 14% in class A.⁸ In present study class B and C together constituted 81.7% of the patient which is considered as fairly advanced liver disease. This means that most of the patients of CLD are asymptomatic in their initial stage and develop symptoms only when CLD had progressed a lot and come to seek care in fairly advanced stage.

Sample size of present study was less, raising a requirement of large randomized clinical trials¹⁴ to confirm the results.

CONCLUSION

CLD is a common entity in Central India with male preponderance and affecting mostly people of middle age

group. People presenting to clinics were at fairly advanced stage with frank symptoms of CLD like ascites, jaundice and history of gastrointestinal bleeding present in most of them. Few patients may also present with life-threatening condition of hepatic encephalopathy. Oesophageal varices are present in most of them and thus they will need prophylactic treatment to prevent variceal hemorrhage in future. Most of the patients of CLD were in Child Pugh Class (B+C), which is an indication for liver transplantation, as prognosis in them is guarded. They have suffered irreversible damage to such an extent that decompensation of liver function has occurred in them.

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Uncommon Presentation of An Uncommon Malignancy

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ABSTRACT

Introduction: Ectopic ACTH syndrome is a rare cause of Cushing's syndrome accounting for about 15% of all cases of Cushing's syndrome. Small cell lung carcinoma and bronchial carcinoid are the common cause of Ectopic ACTH syndrome. Surgery is the treatment of choice for Ectopic ACTH syndrome.

Case report: A 40 year old hypertensive male presented to the hospital with chief complaint of pain in both lower limbs and inability to get up from squatting position since 3 months. On evaluation the patient is found to have Cushing's syndrome with a mass in the lower lobe of left lung as source of ACTH. Biopsy of the mass revealed it to be bronchial carcinoid.

Conclusion: The case is reported in view of very low incidence of bronchial carcinoid and its rarity to present with features of Cushing's syndrome without any respiratory manifestations.

Keywords: Pain in lower limbs, ACTH, lung mass, Cushing's syndrome, Bronchial carcinoid.

INTRODUCTION

Cushing's syndrome refers to symptom complex resulting from excess steroid hormone production by adrenal gland.¹ The causes for excess steroid production can be in pituitary gland, adrenal gland or an ectopic site. Ectopic ACTH syndrome results from autonomous ACTH production from extrapituitary malignancies accounting for about 15% of all causes of Cushing's syndrome. Small cell carcinoma of lung and carcinoids account for majority of causes of Ectopic Cushing's syndrome.

The common clinical features of Cushing's syndrome are Moon facies, Buffalo hump, Central obesity, Diabetes mellitus, Hypertension, Purplish striae, Proximal myopathy and Electrolyte imbalances.² Chronic excess of cortisol in the body is associated with life threatening infections.

Localisation of the Ectopic site of ACTH is a diagnostic challenge. It has been reported that about 50% of Ectopic ACTH syndrome are undetectable by CT and MRI.⁷ FDG PET scan offers higher spatial resolution for detection of small lesions but its results are dependent on the tumor metabolism.⁸

CASE REPORT:

A 40 years old male known Hypertensive since 1 year on Tab Telmisartan 40 mg OD presented to internal medicine OPD with chief complaint of Pain in both calf muscles and inability to get up from squatting position since 3 months. He is a non smoker, occasional alcoholic (weekly twice). For the above complaints he was admitted in another hospital found to have hypokalemia, symptomatic treatment was given and discharged.

O/E: The patient was obese (BMI: 27), with acanthosis nigricans and proximal myopathy. Blood pressure: 150/ 90 mm hg. Other systemic examination was in normal limits.

During the hospital stay, routine laboratory tests revealed severe hypokalemia (k+ 2.7), Hb: 14.5 gm /dl TC: 12000, ESR: 16mm/hr, AST: 35, ALT: 37, HbA1C: 7.2%, Creatinine: 0.8, ECG,

2DECHO and CXR were in normal limits.

As the patient had refractory hypokalemia with urinary spot potassium (35.18), HTN, type 2 DM and proximal myopathy Cushing's syndrome was considered as one of the differentials and serum cortisol (6 am) was sent. Serum cortisol 6 AM: 43.38 that persisted to be high even after low dose of dexamethasone (1mg) the prior night. So a diagnosis of Cushing's syndrome was made and Serum ACTH levels were sent. ACTH was high (131) which favoured the diagnosis of ACTH dependent Cushing's syndrome.

To identify the source of ACTH production (Pituitary or Ectopic) an MRI brain (Figure-1) and high dose dexamethasone suppression test were done, which were in favour of Ectopic ACTH production. An FDG PET scan is done to localise the site of ectopic ACTH production that revealed a 6X5X4 cm (Figure-2) lobulated heterogeneously enhancing mass in the lower lobe of left lung parenchyma. Endoscopic ultrasound guided biopsy of the lesion (Figure-3) revealed it to be malignancy, with the aid of immunohistochemistry (Figure-4) it was proven to be Carcinoid.

	Serum cortisol
Initial	43.38
Low dose dexamethasone suppression	58.95
High dose dexamethasone suppression	76

DISCUSSION

The syndrome of Ectopic ACTH Secretion which relates to source other than pituitary or adrenals is rare. WH Brown first described it in 1928 as Diabetes of Bearded Women in a patient suffering from oat cell lung carcinoma.³ The definition of the syndrome was established by Meadar and Liddie in 1962 who were the first to demonstrate biologically active ACTH in a lung carcinoid tumor.

The case reported here is to emphasise the need of complete evaluation of patient presenting with hypertension and hypokalemia with Cushing's syndrome as one of the differential diagnosis.

In Cushing's syndrome hypertension and hypokalemia are attributed to mineralocorticoid like activity of cortisol but not due to excess mineralocorticoid. The local cortisol conversion to cortisone by the action of 11 beta-hydroxysteroid dehydrogenase is the rate limiting step for the mineralocorticoid activity of cortisol. When cortisol levels are higher the action of this enzyme is insufficient and mineralocorticoid effects appear.⁶ Ectopic

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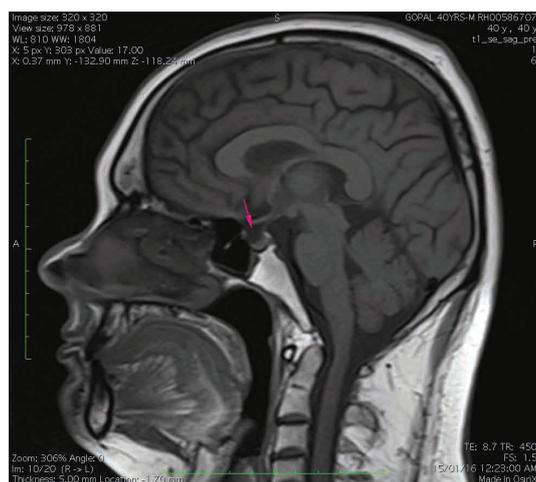


Figure-1: MRI of Pituitary (Arrow pointing normal pituitary)



Figure-3: EUS showing A 6 X 5 cms lesion in the lung

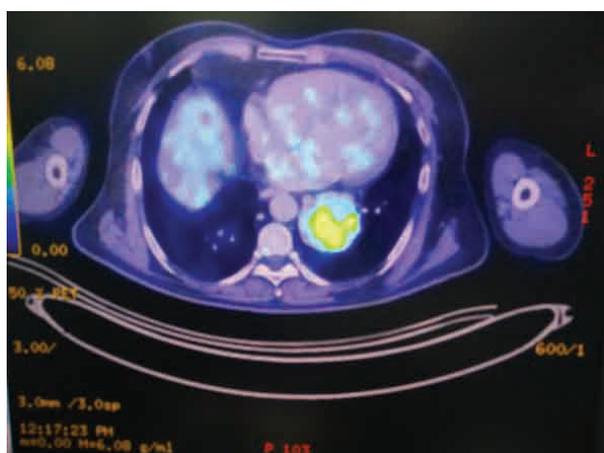


Figure-2 PET CT Showing Metabolically active Lesion in the left lower lobe of lung

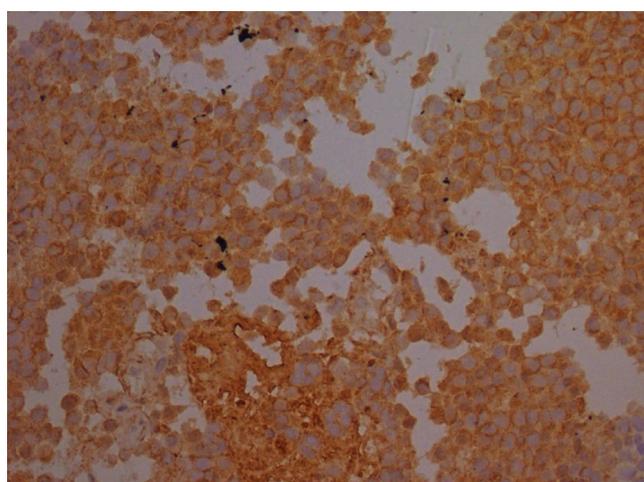


Figure-4: IHC suggestive of carcinoid tumor

Cushing's syndrome frequently presents a major diagnostic challenge. Ectopic source of ACTH production is located in the lungs in the majority of cases with small cell carcinoma and carcinoids being the commoner. Bronchial carcinoids account for about 10% of all causes of Ectopic ACTH syndrome. The incidence of bronchial carcinoids is 0.2 to 2 /100000.¹

Diagnosing Ectopic ACTH syndrome is difficult as Dexamethasone suppression test and CRH stimulation test have a high false positivity. Recent data suggest Inferior petrosal sinus sampling to be the most accurate in the differentiation of pituitary from extra pituitary sources of ACTH.⁴

In our case diagnosis of Ectopic ACTH syndrome was made based on

- High serum cortisol (43.38)
- High serum ACTH (131)
- Inability of high dose of dexamethasone to suppress serum cortisol.
- Normal MRI pituitary and CT abdomen(adrenals)
- A 6X5 cm metabolically active lesion in lower lobe of left lung parenchyma.

Imaging modalities are the cornerstone of Ectopic ACTH syndrome because removal of the tumor is the only potential curative treatment. It has been described that in 30 % to 50% of patients with ACTH dependent cushings syndrome the source of ACTH could not be identified by conventional imaging like

CT, MRI, PET, and SRS.^{7,8}

The patient mentioned above was subjected to FDG PET scan in view of high suspicion of malignancy (Positive family history and Weight loss of 6kgs in 1 month). He was planned for surgical excision of the carcinoid but the patient lost to follow up.

Bronchial Carcinoid presenting with features of Cushing's syndrome without respiratory symptoms is rare. Most common presenting features are cough, hemoptysis, wheeze, dyspnea. About 1-2% of carcinoids manifest with features of Cushing's syndrome.^{9,10} Excision of the tumor is the only potential curative modality.

CONCLUSION

The case is reported in view of rare occurrence of bronchial carcinoid and its rarity to present with features of Cushing's syndrome without any respiratory symptoms. By this case report we emphasise the need for complete evaluation of young hypertensives so that a treatable cause would not be missed.

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Evaluation and Management of Adult Patients with Bilateral Nasal Obstruction Secondary to Adenoid Hypertrophy using Endoscopic Adenoidectomy

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ABSTRACT

Introduction: Adenoid tissue is one of the first line immunological defense mechanisms of upper aero-digestive tract and reaches its maximal size between three and seven years of age. Atrophy occurs from the age of ten years and is usually completed by the age of twenty. However, in current clinical practice especially with advent of nasal endoscopy, adenoid tissue hypertrophy is not uncommonly found in adults. This study aims to assess adenoid hypertrophy in adult patients with bilateral nasal obstruction.

Material and Methods: Included patients were above age of twenty years, presenting with bilateral nasal obstruction and associated symptoms. All cases were evaluated clinically and further assessed by diagnostic nasal endoscopy, X-Ray Paranasal sinuses (PNS)/Nasopharynx, CT PNS. Out of these, 30 confirmed cases of adenoids satisfying inclusion and exclusion criteria were taken and surgically treated.

Results: Endoscopic adenoidectomy was performed in all 30 cases. Endoscopic follow up was done for a period of 6 to 18 months; only two patients had recurrence requiring revision surgery, and two cases required ventilation tubes. There was improvement in all of the preoperative symptoms, 22 cases became asymptomatic, 6 cases improved and 2 cases failed.

Conclusion: Enlarged adenoid in adults should be considered in the differential diagnoses of cases suffering from bilateral nasal obstruction, or presenting with a nasopharyngeal mass with aural problems. Endoscopic adenoidectomy is safe and reliable method of treatment helping in complete removal of adenoid tissue with good hemostasis and with no injury to Eustachian tube.

Keywords: Adenoids, Adults, Bilateral nasal obstruction, Hypertrophy, Nasal endoscopy

INTRODUCTION

Santorini described the nasopharyngeal lymphoid aggregates or 'Luschka's tonsil' in 1724 and Willhelm Meyer coined the term 'adenoid' in 1870. Adenoidal tissue is one of the first line immunity systems of the upper aero-digestive tract attaining maximal size between three and seven years of age. Atrophy begins from the age of ten years which is usually completed by the age of twenty.¹⁻⁴ Although conditions associated with adenoidal hypertrophy are generally considered to be a disease of childhood, to our present knowledge, no study has accurately examined the incidence of adenoidal hypertrophy in adults. In current clinical practice, with nasal endoscopy forming a routine part of clinical nasal examination, adenoidal tissue is not uncommonly found in adults. However, it is not possible to clearly distinguish neoplastic adenoidal tissue from benign hypertrophy based on the macroscopic appearance alone. This study aims to assess adenoid hypertrophy in adult patients with bilateral nasal obstruction with respect to clinical features and investigative findings. Also the effectiveness of transnasal

endoscopic adenoidectomy has been evaluated.

MATERIAL AND METHODS

The prospective study was done in accordance with the Helsinki Declaration of 1975, as revised in 2000. It was conducted on 30 adult patients based on inclusion and exclusion, aged above 20 years presenting with bilateral nasal obstruction along with enlarged adenoids after taking informed written consent. Inclusion criteria were of age 20 years and above, with past history of adenotonsillectomy and with endoscopically and radiologically confirmed adenoid hypertrophy. Benign and malignant lesions of the nasopharynx were excluded.

Routine blood investigations, urine for albumin, sugar and microscopy were undertaken. Radiology included X-ray lateral Nasopharynx and Computed tomography scan of nose and paranasal sinuses. Patients with aural symptoms also underwent pure tone average and impedance audiometry.

The 0 degree, 4 mm nasal endoscope (Karl Storz) was utilized to identify the nasopharyngeal mass. Mass either had smooth or an irregular surface. The origin of the masses was from the vault and /or posterior wall of the nasopharynx. Profuse retained secretions were found in front of the adenoid mass (Figure-2a) at the posterior aspect of the inferior meatus and nasal cavity in six cases (Table-2). Associated chronic sinusitis was found in six cases, secretory otitis media in two cases and bilateral chronic suppurative otitis media in two cases.

The patients were operated under general anesthesia in a supine position with the neck extended. The nasal cavities and nasopharynx were examined with a zero-degree nasal endoscope (4mm) without any vasoconstrictor packing. If the nasal cavity was congested, ribbon gauze soaked with 4% xylocaine or 0.05% oxymetazoline with adrenaline solution was used to pack nasal cavity for 5 minutes to shrink the nasal mucosa. A throat pack was also inserted to prevent any blood from entering the trachea. A Boyle-Davis mouth gag was inserted to open the mouth widely as during the classic adenoidectomy. A suitably sized Beckmann adenoid curette was placed transorally into the nasopharynx.

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Under nasal endoscopic guidance, the blade of the adenoid curette was placed just above the superior border of the adenoid (Figure-2b). The nasal endoscope was then taken out from the nose and the adenoid tissue was curetted using sustained force as described in conventional adenoid curettage. Any bleeding was controlled using transoral packing gauze for 3 to 5 minutes, cauterization was not needed at the adenoid area. The lateral part of the adenoid then removed transnasally using cutting forceps commonly used in the endoscopic sinus surgery. The midline adenoid bulk was then removed transorally by curettage as described previously. Post operatively patients were given oral antibiotics, analgesics and antihistamines. Nasal packing was removed in patients with septoplasty after 48 hours. Endoscopic follow up for a period of 6 to 18 months (average of 12 months) was done.

STATISTICAL ANALYSIS

Descriptive statistics was used to infer results. All symptoms and signs were calculated in percentage. All tables were computed using Microsoft word 2007 and charts using Microsoft Excel 2007.

RESULTS

This study was conducted on adult patients aged above the age of 20 years with bilateral nasal obstruction, 30 such cases of enlarged adenoids were found. There were 18 males and 12 females patients studied for a period of 18 months. All patients had bilateral nasal obstruction along with headache in eight cases, nasal tone and snoring in three cases, postnasal discharge, deafness and rhinorrhea in six cases. The duration of the symptoms ranged between two and ten years with average of six years. (Table-1)

Associated conditions in our series were four patients with history of previous adenotonsillectomy in childhood with one patient having history of septal surgery with partial turbinectomy, two patients with immunocompromised state (HIV), six patients had nasal allergy and eight patients had associated deviated nasal

septum.

All of the cases reported previous medical treatments in the form of antibiotics, antihistamines and/or decongestants (local or systemic).

Most common symptom was nasal obstruction while most common otological sign was retracted tympanic membrane. Most common anterior rhinoscopic finding was mild deviated nasal septum (Table-2). In all the cases endoscopic assisted adenoidectomy was performed under general anesthesia. All 30 patients underwent endoscopic adenoidectomy and postoperative period was uneventful. Endoscopic follow for a period of 6 to 18 months was done. Two patients had recurrence and required revision surgery whereas two cases required ventilation tubes.

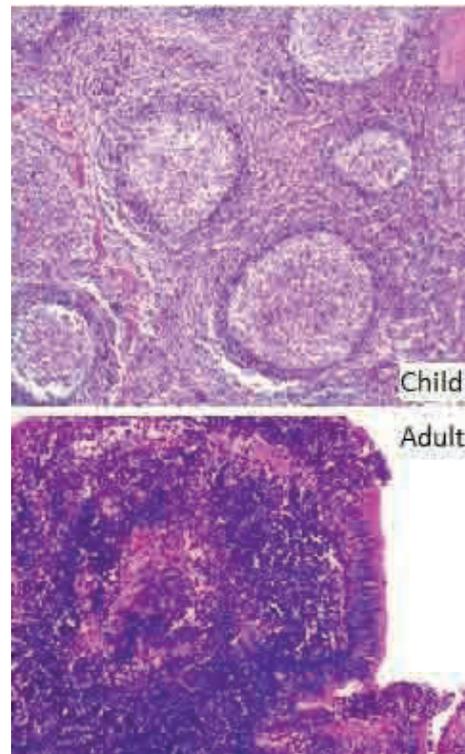


Figure-1: HPE appearance of child and adult adenoids

Sl. No.	Symptom	No.	%
1	Nasal obstruction	30	48.4
2	Head ache	8	12.9
3	Postnasal discharge	6	9.7
4	Rhinorrhea	6	9.7
5	Deafness/tinnitus	6	9.7
6	Nasal tone	3	4.8
7	Snoring	3	4.8
	Total *	62	100

*The total is more than 30 because the symptoms are overlapping
Table-1: Symptoms of adult adenoid

Sl. No.	Finding	No.	%
1	Mild deviated nasal septum	8	30.7
2	Hypertrophied inferior turbinates (pale)	6	23.07
3	Hypertrophied inferior turbinates (congested)	6	23.07
4	Muroid nasal discharge	6	23.07
5	Mucopurulent nasal discharge	Nil	0
	Total	26	100

Table-2: Anterior Rhinoscopic findings of adult adenoid

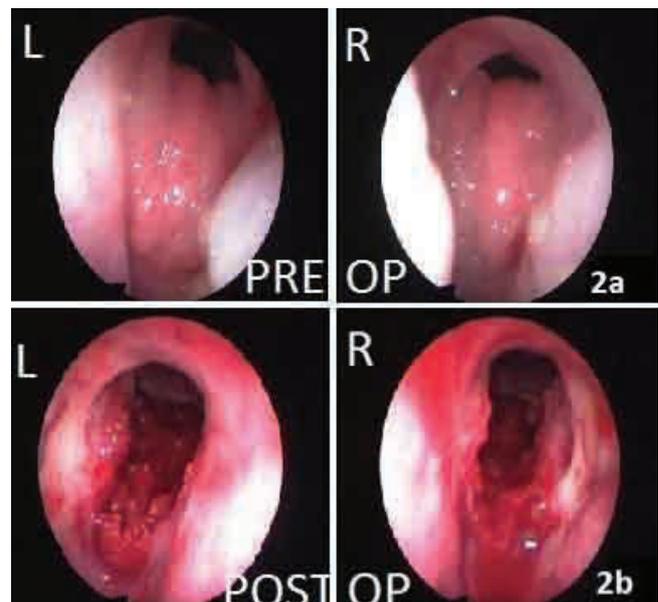


Figure-2: Nasal Endoscopic findings pre op and post op

On histopathological examination, the adenoids showed intense chronic inflammatory cell infiltration and secondary changes such as squamous metaplasia in the surface epithelium and fibrosis (Figure-1).

Subjectively, patients became asymptomatic in 22 cases; partial improvement was seen in six cases, whereas two patients showed no improvement at the end of follow – up.

DISCUSSION

Alaa A, Hamed Wahab¹ studied 18 cases aged 27-59 years with nasal obstruction and/or serous otitis media. All patients were treated by endoscopic nasopharyngeal mass resection and were found to have benign lymphoid hyperplasia on histopathology whereas immunohistochemical study revealed prominent cellular proliferation of B cell lineage, with IgA and IgG defect, and production of IgM, IgE indicating infection, type I hypersensitivity and surface barrier immunodefect.

Park SK et al,³ in retrospective study done on 18 adult patients who underwent adenoidectomy due to adenoid vegetation, showed adenoid to nasopharyngeal ratio in these patients from 7.5 to 9.0. The main symptom of the patients was snoring whereas in our study it was nasal obstruction and associated snoring was present in only 4.8%.

N Yildirim et al⁵ performed a study comparing etiology and pathological characteristics of adults and childhood adenoid hypertrophy and concluded that adults having adenoid hypertrophy represented a long standing inflammatory process rather than being a novel benign entity.

Roy F. Nelson,⁶ M.D., did a clinical study on 19 cases of adenoids in adults with definite pathological importance in twelve and possible significance in three. In six patients, tonsillectomy had been performed previously without attention to the adenoids. A considerable percentage (15.0%) of the adult patients in the present study gave a history of past adeno-tonsillectomy suggesting that there was inadequate removal of the adenoidal tissue at the previous surgery.⁵

James E Mitchell et al⁷ did a retrospective study on 110 adult patients who had biopsies of postnasal tissue. Primary symptoms of patients were otitis media with effusion in 42%, snoring or nasal obstruction in 43%, cervical lymphadenopathy in 11%, 2 cases of bleeding in post nasal space, 2 cases of post nasal drip, 2 cases incidental and one case of facial pain. Biopsies were reportedly benign in 92 (84%) patients. A malignant biopsy was found in 18 cases (16%). Differential diagnosis of malignancy was included in this study. The presence of a lymphoid mass in an adult nasopharynx is suspicious, especially when accompanied by unilateral middle-ear effusion, and nasopharyngeal cancer should always be ruled out in such cases. Ultra structural changes in lymphocytes in smoking-induced AH and malignant transformation in HIV related AH have been demonstrated.^{8,9}

Obstructive AH is usually associated with childhood and has been overshadowed by accompanying rhino pharyngeal disorders.^{10,11} Nasal endoscopic examination is major breakthrough in the diagnosis of sinonasal diseases; it could accurately diagnose the nasopharyngeal adenoid, its size, shape and degree of encroachment on the airway and Eustachian tube. Various mechanisms have been proposed to explain the lymphoid hyperplasia in the adult nasopharynx, including the persistence of childhood adenoids or re-proliferation of

regressed adenoidal tissue in response to irritants like smoke, dust or infections.¹⁰ Finkelstein et al¹² reported obstructive adenoids in 30% of heavy smokers. AH caused by viruses in adults with compromised immunity, patients of organ transplants or having human immune deficiency virus (HIV), is a well-known phenomenon.¹³

Developmental nasal septum deviation usually manifests after adolescence, affecting nasal physiology and predisposing the person to chronic Sinonasal inflammation and post-nasal drip. Nasal septum deviation may also indirectly cause low-grade chronic inflammation of the adenoids. On inspiration, inhaled air passes through thin nasal cavity and then released suddenly and changes direction downwards. As a result, the speed of the air stream becomes slower and the dust, bacilli or poisonous gases adhere or stimulate the nasopharyngeal wall more easily.¹⁴ In our study, the coexistence of obstructive AH and obstructive nasal septum deviation in 25.0% of adult group is noteworthy.

The significant association between AH and otitis media with effusion in the childhood group is unsurprising: it is well known that children are more susceptible to middle-ear inflammation owing to their shorter and less tortuous Eustachian tubes.¹⁵ Although some investigators attributed the enlargement of the nasopharyngeal tonsil in allergic disorders, others denied any significant role of the nasopharyngeal tonsil in allergic reactions.^{2,3} Enlarged nasopharyngeal tonsils in adults has some differences from that in children macroscopically the mass had smooth or irregular surface. The histological features of childhood adenoids are largely consistent with hyperplasia, characterized by an increase in the volume and number of germinal centres.¹⁶⁻¹⁸ In contrast, the surface epithelium of the adenoids removed from adults showed intense chronic inflammation, fibrosis and squamous metaplasia (Figure-1).

In a study by Reda H. Kamel et al¹¹ on 35 adults in Cairo University, Egypt, showed marked improvement in 94% of patients without major complications similar to ours with 100% improvement. Endoscopic follow up for 17 months identified recurrence in two cases similar to our study (recurrence in two cases over 18 months). He further concluded that enlarged adenoid tissue in adults has some histopathological differences from that in children and transnasal endoscopy was safe and reliable, which we concur to the fact that subjectively, patients became asymptomatic in 22 cases, partial improvement was seen in six cases in our study after endoscopic adenoidectomy. Limitations of our study were the small sample size and the patient symptomatic improvement was measured subjectively.

CONCLUSION

Enlarged adenoids in adults should be considered in the differential diagnosis of cases suffering from bilateral nasal obstruction, or presenting by a nasopharyngeal mass with aural problems. Histopathologically it can be termed as chronic hypertrophic nasopharyngitis or chronic adenoiditis. Enlarged adenoids in adults have some macroscopic and microscopic differences from that in children.

Endoscopic adenoidectomy is safe and reliable. The nasal endoscope helps in removal of the enlarged adenoid tissue completely with good hemostasis with no injury to Eustachian tube opening and complications associated with conventional techniques can be prevented.

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Interlocking Nail in Diaphyseal Fracture of Tibia –A Clinical Study

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ABSTRACT

Introduction: Closed reduction internal fixation with intramedullary interlocking tibial nail is currently the treatment of choice for fractures of shaft of tibia with advantages of early stabilization, early mobilization, with high union rates, less infection rate and implant failure. Aim of the current research was to study diaphyseal fractures and to assess functional outcome of patients with tibial shaft fracture treated with intramedullary interlocking tibial nail.

Material and Methods: A prospective study of 30 adult males and females age group presenting with tibial shaft fracture to Orthopaedic Department of Rohilkhand Medical College were admitted and evaluated from July 2014 to July 2015. Patients fulfilling our inclusion criteria and those who were surgically fit, were included in the study and treated with intramedullary interlocking tibial nail. Johner and wruh's criteria was used to assess the functional outcome.

Results: The results were fair in 6.67%, excellent in 76.67%, good in 30%.

Conclusion: Fracture shaft of tibia are commonly seen in road traffic accident and are common in young people. Tibial intramedullary interlocking nailing has advantages as it preserves periosteal blood supply, maintains length, rotation, alignment, lowers the infection and malunion. Closed internal fixation with intramedullary interlocking tibial nail is a standard surgical procedure for management of tibial diaphyseal fractures. Ambulation without external immobilization can be done early and it also reduces the hospital stay and patient can resume his work activities early as tolerated.

Keywords: Closed nailing, Interlocking, Diaphyseal fractures of tibia.

INTRODUCTION

A tibial shaft fracture occurs commonly due to trauma, commonly in middle-aged and young people. Less prevalent in childrens and older people. Commonest site of long bone fractures is tibial shaft because of its superficial location.¹

Most common long-bone fracture is tibial shaft fracture encountered by most of the orthopaedic surgeons. Around 26 tibialdiaphyseal fractures per 100,000 of the population per year seen in average population. Females are less commonly affected than males, as the male incidence is about 41 per 100,000 per year and incidence of females is about 12 in 100,000 per year. The average age seen in tibial shaft fracture population is about 37 years; in females 54years and in males 31 years.²

One third of tibial surface is subcutaneous therefore open fractures are common in tibial shaft. Due to hinge joints at the ankle and knee, no adjustment occur for rotatory deformity after a tibial shaft fracture. Non union, infection and delayed-union and are common complications after open tibial shaft fractures. Rapid restoration of bone continuity and early callus formation are the main aim for diaphyseal fracture of tibia. Intramedullary interlocking tibial nailing is preferred over other methods. It's a

closed procedure, the periosteum is not disturbed, less incidence of infection, no disturbance of hematoma and soft tissue injury. Treatment aim of tibial shaft fractures are to re-establishing pre-injury anatomy and lower complication rates. Several methods have been used for treatment of this fracture. Closed reduction and cast immobilization have previously been regarded as the standard treatment for low-energy tibial shaft fractures. However, during the last few decades, locking intramedullary (IM) nail has become a popular method for treating tibial shaft fractures.³ The Aim of this study was to study the diaphyseal fractures and to assess functional outcome of patients with tibial shaft fracture treated with intramedullary interlocking tibial nail.

MATERIAL AND METHODS

Adult males and females age group presenting with tibial shaft fracture to Orthopaedic Department of Rohilkhand Medical College were admitted and evaluated from July 2014 to July 2015. Ethical clearance and informed consent were taken prior to study. Patients fulfilling our inclusion criteria and those who were surgically fit, were included in the study. Prospective study of 30 cases was done.

Inclusion criteria

- Greater than 18years of age.
- Acute fractures of diaphysis of tibia.
- Compound grade 1 and 2 fractures (Gustillo Anderson type) and Closed fractures.
- Segmental fractures
- Communited fractures.

Exclusion criteria

- Less than 18 years of age.
- Compound Grade 3 fractures (gustillo Anderson).
- Pathological fractures, fracture non-union and delayed union.
- Patients not willing and medically unfit for surgery.

The patients were selected based on the history, clinical examination, radiography.

The orthopedics trauma association (OTA), AO classification of tibialdiaphyseal fractures was followed for typing the tibial fracture. All the selected patients were treated with intramedullary interlocking nail and regular follow up for a

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period of six months was maintained at 4 weeks interval. The postoperative follow up and assessment was based on Johner and Wruh's criteria

Grading were done as poor, fair, good or excellent according to Johner and Wruh's criteria (Table-1).

STATISTICAL ANALYSIS

Data was evaluated based on the descriptive statistics. Microsoft word 2007 was used to generate tables and graphs.

RESULTS

In our study total 30 patients were included between age group of 18-69years (figure-1). Average age of the patient in the study was 36.2years. Left tibia was affected in 53.33% of cases. Road traffic accidents were the main mode of injury in 86% of cases (Table-2). 76.67% of the fractures were closed and 23.33% were open (Gustillo-anderson). Majority of fractures were located in the middle-third (40%) in 12 patients and in lower-third in 10 patients (33.3%). Type A 60 % was the most common in 18 patients. Oblique fractures was 33.33% and spiral and transverse are 26.66%. □Fibula was fractured in 80% of cases.Average time duration from injury to surgery is 3.6 days. Females required smaller sizes of nail 8mm and 9mm and males required larger than females 10mm. Female required less length nail less than 340mm and males required more length nail >340mm. Reamed closed intramedullary interlocking nailing is done in all the cases. We started full weight bearing at 18 weeks around while partial weight bearing in 80% at 4-8 weeks and in 8-12 weeks in remaining 20% in our study. Five of our patients required dynamisation. Average duration of hospital stay is 13.01 days. The average healing time was 20.13 weeks. □In our study superficial infection is seen in 3% of patients and anterior knee pain in 10% of patients and fat embolism is seen in 3.33% of patients and shortening is seen in 6.67% of patients

and delayed union is seen in 6.67% of patients. In our study deformities is seen in 13.33% of patients out of which coronal deformities is seen in 4 patients and in that 4 patients one patient also has saggital deformity. In our study 23 patients (76.67%) had excellent, 5 patients (23.3%) had good, 2 patients (6.67%) had fair functional outcome (Table-3).

DISCUSSION

Thirty patients were included in the study, who were admitted to the Orthopaedics Wards of Rohilkhand Medical College, Bareilly Uttar Pradesh. This group patients comprising of male and female in the age group of 18 to 69 years were included in this study.

It includes open injuries, closed injuries as well as different patterns of fractures treated by closed method. In this study, the patients fall in 18-29 years of age group. There were 13 patients in this age group in our study. The average age of the patient in our study was 36.2 years. Fractures of shaft of tibia were commonly seen in the younger people because they are physically active and are also engaged in different outdoor activities, and that's the reason for high-velocity injuries.

Arne Ekeland et al concluded in a study, the patients average age was 35 years.⁴ The average age was around 37 years in a study by Court Brown et al in 1995 in a study.⁵

In this study, males predominated the females. There were 25 male patients (83.33%) and 5 female patients (16.67%). The incidence of males is higher because of their more outdoor activities, while women are involved in household activities.

Court Brown et al observed incidence in his study of around 18.7% and 81.3% in females and males⁵ while Hooper et al observed around 18%and 82% incidence among females and males.⁶ Our study of 83.33% males, the incidence is higher when compared to above studies, whereas 16.67% females in our study is lower when compared to other studies.

Sl no	Criteria	Excellent (Left=Right)	Good	Fair	Poor
1.	Non-unions, osteitis, amputation	None	None	None	Yes
2.	Neurovascular disturbances	None	Minimal	Moderate	Severe
3.	Deformity				
	Varus/ Valgus	None	2-5°	6-10°	>10°
	Anteversioin/ Recurvation	0-5°	6-10°	11-20°	>20°
	Rotation	0-5°	6-10°	11-20°	>20°
4.	Shortening	0-5mm	6-10mm	11-20mm	>20 mm
5.	Mobility				
	Knee	Normal	>80%	>75%	<75%
	Ankle	Normal	>75%	>50%	<50%
	Subtalar	>75%	>50%	<50%	--
6.	Pain	None	Occasional	Moderate	Severe
7.	Gait	Normal	Normal	Insignificant limp	Significant Limp
8.	Strenuous activities	Possible	Limited	Severely limited	Impossible
9.	Radiological Union	Consolidated	Consolidated	Union	Not consolidated

Table-1: Johner and Wruh's criteria for evaluation of functional outcome

Mode of injury	Number of patients	Percentage
RTA	26	86.67%
Fall	4	13.33%
Total	30	100%

Table-2: Mode of injury

Functional outcome	Number of patients	Percentage
Excellent	23	76.67
Good	5	13.33
Fair	2	6.67
Poor	0	0
Total	30	100.00

Table-3: Functional outcome

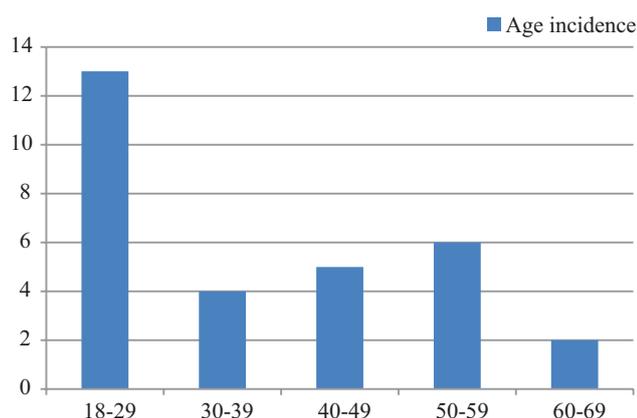


Figure-1: Graph showing age incidence

The incidence of fracture shaft of tibia due to road traffic accidents seemed to be higher in our study (86.6%) compared to Court Brown et al in whose study, the incidence was around 37.5%.⁷ But in this study, also the road traffic accidents was commonest mode of injury followed by fall. This is because of poor road quality and avoiding traffic sense, leading to a higher incidence of road traffic accidents in our country.

In our study, 12 (40%) patients the location of the fracture was in the middle-third of the shaft of tibia, followed by the lower third in 33.33% of the cases. Lawrence B Bone et al noted in his series 53.5% were middle-third fractures.⁸ The tibia in middle-third is more subcutaneous and rigid in nature make it more vulnerable to the injuring force.

Our series had an higher incidence of oblique fractures in 33.33% of cases, transverse fractures made up 10% cases. Oblique and transverse fractures made 43.33% fractures (13 patients). This is comparable to Court Brown et al reported 37.2%.⁹

Fracture of fibula along with the shaft of tibia in our series were in 80% of cases, Court Brown et al reported fracture of fibula in 77.7% of the cases.⁹

18 weeks was the average full weight bearing time. In communitated fractures full weight bearing was delayed in few patients. Lawrence B.Bone et al in his study concluded that in unstable fractures delayed weight bearing was done.⁸ In our series, majority of fractures united in 16 patients were within 20 weeks. The average union time was 20.1 weeks. Court Brown et al⁹ and Arne Ekeland et al⁴ reported average union time at 16.7 and 16 weeks.

Lawrence B.Bone et al observed 6.25% rate of infection.⁸ Arne Ekeland et al noted infection rate of 4.4%⁴ and Blachut PA et

observed 1% rate of infection.¹⁰ In our study, superficial infection rate was 3% and it healed with dressings and antibiotics.

In our study 10% patient reported anterior knee pain. In these patients the nail was abutting the soft tissues and bone structures like tibial tuberosity, patellar tendon and menisci damage causing anterior knee pain. Hernigou P et al, who noted improper entry of nail into medullary canal, may cause anterior knee pain.¹¹ Jarmo AK Toivannen et al observed anterior knee pain intibial intramedullary interlocking nailing.¹²

In our study 3 patients had valgus deformity of 2 – 5 degrees and varus deformity of 2-5 degrees is seen 1 patients, anteversion of 0- 5 degrees is seen in 1 patient. Arneekeland et al observed varus deformity in 4 patients and valgus deformity of 6-10 degrees in 6 patients and, anteversion of 6 – 10 degrees is seen in 3 patients.⁴

In our series final outcome was done using the Johner and Wruh's criteria, at 6 months taking into account the following symptoms of pain, gait, deformity, shortening, range of motion of knee, ankle and subtalar joints, neurovascular disturbances, radiological union and presence or absence of non-union, ability to do strenuous activities. Grading of functional outcome was done according to poor, fair, good and excellent.^{13,14}

In our series, 76.67% (23 patients) have got excellent, 16.67% (5 patients) have good and 6.67% (2 patients) with fair functional outcome. Arne Ekeland et al reported 64.4% excellent, 28.8% good and 4.4% as fair.⁴

CONCLUSION

Fracture shaft of tibia are commonly seen in road traffic accident and are common in young people. Tibial intramedullary interlocking nailing has advantages as it preserves some endosteal blood supply and whole periosteal blood supply, maintains length, rotation, alignment, lowers the infection and malunion.

Well established standard surgical procedure for management of tibial diaphyseal fractures is Closed internal fixation with intramedullary interlocking tibial nail under c arm guidance. Ambulation without external immobilization can be done early with this operating procedure in most of the cases. It also reduces the hospital stay and patient can resume his work activities early as tolerated.

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Is Chronic Rhinosinusitis and Status of Pharyngeal End of Eustachian Tube Link-Up: All Smoke No Fire?

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ABSTRACT

Introduction: Chronic Rhinosinusitis is one of the commonly encountered problems in otorhinolaryngology practice. Aim was to study the effect of Chronic Rhinosinusitis on pharyngeal end of Eustachian tube opening by nasal endoscopy, and to emphasize the need for proper diagnostic endoscopic evaluation in Eustachian tube dysfunction.

Material and Methods: Eighty three patients of Chronic Rhinosinusitis, in the age group of 18-65 years, were identified. Eighty three patients were selected as control group having asymptomatic deviated nasal septum and no subjective or objective evidence of chronic rhinosinusitis. The changes at the pharyngeal end of the Eustachian tube were assessed by endoscopy, according to the types of changes, graded from I to V.

Results: Evaluation revealed that Chronic Rhinosinusitis causes changes at the pharyngeal end of the Eustachian tube in 81.92% (68/83) cases. Type I (normal Eustachian tube) was seen in 18.08% (15/83). Type II changes were seen in 71% (59/68) cases, type III changes were seen in 13.23% (9/68) cases. In control group normal ET orifice was seen in 74.69%, Type II changes were seen in 18.07% and type III changes in 7.22% cases.

Conclusion: Chronic Rhinosinusitis cause changes at the pharyngeal end of Eustachian tube, in the form of congestion, mucosal oedema and blockage of tube. This in turn can lead to middle ear disease. Nasal endoscopy should be done in all the cases of chronic rhinosinusitis, to examine nose, nasopharynx and pharyngeal end of Eustachian tube.

Keywords: Chronic rhinosinusitis, Pharyngeal orifice of Eustachian tube

INTRODUCTION

Chronic rhinosinusitis (CRS) is one of the commonly (16.3%) encountered problem in Otorhinolaryngological practice.¹ Various diseases of the nose and paranasal sinuses may affect function of Eustachian tube (ET) and consequently the middle ear. Sinus inflammation causes alterations in normal pathways for secretions out of sinus system. The normal secretion pathways usually bypass the orifice of Eustachian tube in the nasopharynx. Excessive or infected mucus can be transported directly over the tubal orifice to cause its obstruction and promote ascending infections in the middle ear. Messerklinger was able to demonstrate that there are two major routes for secretions from the paranasal sinuses. The mucus streams from out of the frontal, maxillary and anterior ethmoidal sinuses pass through the frontal recess and the ethmoidal infundibulum. This mucus is then transported over the posterior free margin of the uncinate process onto the medial surface of the inferior turbinate. This stream normally passes anterior and inferior to the tubal orifice.

This secretion route is then also joined by the mucus coming from septal mucosa. The second route for secretions combines the mucus from the posterior ethmoidal cells and the sphenoid sinuses. These are drained posterior and superior to the tubal orifice.² The secretions then pass along the lateral pharyngeal gutter and pyriform fossa.

In sinusitis the quality and quantity of mucus is altered to either mucopurulent or purulent. Secretions pass over the pharyngeal end of ET and it can lead to inflammation of ET, hypertrophy of lymphoid tissue collection (tubal tonsil hypertrophy). This results in obstruction of ET leading to various middle ear pathologies.

The study was under taken to know the condition of pharyngeal end of ET in patients having CRS. The nasal endoscopy allows a direct visualization of the tubal orifice. The evaluation of pharyngeal end of ET was done with the help of nasal endoscope.

MATERIAL AND METHODS

This is a prospective, comparative diagnostic study, carried out at a tertiary care center after taking informed consent. All the cases of CRS were diagnosed clinically using AAO – HNS 2007 criteria.³

Inclusion criteria

1. Patients of Chronic Rhino Sinusitis, on the basis of detailed history and clinical examination, who were not responding to 12 weeks of medical treatment.
2. Patients who were suffering from at least two of the following symptoms.
 - Nasal obstruction
 - Anterior and /or posterior nasal discharge
 - Headache / facial pain
 - Abnormalities of smell

Exclusion criteria

1. Subjects less than 10 years of age
2. Previous history of sinonasal surgery
3. Sinonasal malignancy
4. Cystic fibrosis
5. Known case of autoimmune disease
6. Known case of debilitating disease
7. Patients who declined to participate

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To add objectivity to the diagnosis, certain measures were added to the above selected patients. Inflammation documented by one or more of the following findings –

1. Purulent (not clear) mucus or edema in middle meatus or ethmoidal polyp,
2. Polyp in nasal cavity or middle meatus, and /or
3. Radiographic imaging demonstrating inflammation of paranasal sinuses.

Sample: Eighty three patients who fulfilled the subjective and objective criteria were included in this study. All selected patients were subjected to Nasal Endoscopy and CT Paranasal sinuses.

Control Group- 83 patients were selected as control group. These were the patients having asymptomatic deviated nasal septum and no subjective or objective evidence of CRS (as per AAO-HNS 2007 criteria).

For our study, we used Maxer’s rigid 4 mm Endoscope with deflection angles of 0 degree to 70 degrees with Maxer’s Endovision Telecam deluxe camera system with monitor. Topical decongestant 4 % Xylocaine with 1 in 1 Lac adrenaline solution was used on cottonoid strips which were inserted in both nasal cavities.

Diagnostic Nasal Endoscopy was performed in three passes. Presence of discharge, polyp, edema, or Scarring, and various anatomical variations were noted. The Eustachian tube opening was examined for following changes, as described by Jose Evandro Andrade Prudente de et al (2007)⁴

- Type 1 Normal Eustachian tube opening
- Type 2 Inflammatory ostium, congested edematous mucosa, (In allergy- pale mucosa), mucopurulent secretions at tubal orifice
- Type 3 Tubal ostium has a lymphoid accumulation of tissue, which forms tubal tonsil.
- Type 4 Hypoplastic ostium.
- Type 5 Cicatricial ostium.

STATISTICAL ANALYSIS

Data collected and transferred to SPSS statistical software package for analysis. Descriptive statistics were used to interpret results.

RESULTS

A total of 83 patients of CRS were selected for this study during

ET status	CRS group (n=83)	Control group (n=83)
Type I	18.08% (15)	74.69% (62)
Type II	71% (59)	18.07%(15)
Type III	10.8%(9)	7.22%(6)
Changes are statistically significant $p < 0.005$		
Table-1: ET Changes in CRS and Control group		

the study period of one year. There were 47 males and 36 female aged between 18 to 65 years. In this study, we wanted to ascertain the role of chronic rhino sinusitis in causing changes at pharyngeal end of the Eustachian tube.

Diagnostic Nasal Endoscopy was done in all 83 cases of chronic rhino sinusitis 55 patients had unilateral sinusitis and 28 had bilateral sinusitis.

Nasal Endoscopic findings were as follows-

- Septal deviation was the most common anatomical variant- 61(73.5%) cases
- Enlarged Bulla with prominent agar nasi- 29(35%) cases
- Concha bullosa- 23(27.7%) cases
- Paradoxical middle turbinate- 23(27.7%) cases
- Polypi in middle meatus- 15(18%) cases
- Medialised uncinate process- 13(15.6%) cases
- Accessory ostium- 17(20.5%) cases
- Discharge in middle meatus- 50(60.24%) cases
- Enlarged bulla- 3(3.6%) cases

Status of Pharyngeal End of ET in CRS patients- Changes at the pharyngeal end of Eustachian tube were seen in 81.92% (68/83) cases. The Eustachian tube showed:

- Type I Normal Eustachian tube was seen in 15 (18.07%) cases.
- Type II changes in 59 (71.1%) cases, out of which-
 - Inflamed, congested and/ or oedematous opening in 48 (57.8%) cases,
 - Secretions at tubal orifice with blockage of tubal opening in 11(13.25%)
- Type III Changes in the form of tubal tonsillar enlargement in 9 cases (10.8%)

Status of pharyngeal end of ET in control group

Finding of ET orifice (pharyngeal end) on nasal endoscopy were as follows:

- Type I (Normal) - 74.69 % (62/83)
- Type II 18.07% (15/83)
- Type III 7.22% (6/83)

Comparison of ET status in CRS group and control group is depicted in table-1

Otoscopy Findings and ET Ostium condition: In CRS group bilateral ear discharge was present in 20 patients (40ears) and unilateral ear discharge in 6 patients. Total number of discharging ear was 46. On examination 26 (31.32%) patients had a central perforation in tympanic membrane while 23 (27.7%) patients had a retracted tympanic membrane. Alterations of ET Ostium in forty six discharging ears were as follows:

- Type I (Normal ostium) – 30.43% (14/46)
 - Type II (inflamed, oedematous ostium) – 60.86% (28/46)
 - Type III (Tubal tonsil hypertrophy) – 8.69% (4/46)
- Bilateral retraction was present in thirteen patients (26 ears) and unilateral retraction was present in 10 patients. Total number of

ET condition	Present Study		Jose et all study	
	COM (46)	Retraction (36)	COM (42)	Retraction (29)
Type I (normal)	30.43%	25%	67%	55.2%
Type II (inflamed)	60.86%	63.88%	7%	13.8%
Type III (tubal tonsil)	8.69%	11.11%	19%	24%
Type IV (hypoplastic)	0	0	2%	6.8%
Table-2: Alteration in ET ostium in Jose et al study and present study.				

ears having retracted drum were thirty six. Alterations of ET in these thirty six ears were as follows:

Type I 25% (9/36)

Type II 63.88% (23/36)

Type III 11.11% (4/36)

CT scan PNS Findings

- Deviated nasal septum - 61 (73.5%) patients.
- Prominent agar cells -30 (36%) patients,
- Concha bullosa - 24 (28.9%) patients,
- Polyp in middle meatus- 15 (18%) patients,
- Medialized uncinat process with mucosal thickening - 14 (16.8%) patients,
- Enlarged bulla - 4 (4.8%) patients,
- Maxillary sinus haziness was seen in 62.25%, ethmoid sinus haziness in 54.50%, frontal sinus haziness in 24.50% and sphenoid sinus haziness in 19.75% patients.

All the patients were appropriately treated for CRS with FESS and medical management.

DISCUSSION

In chronic inflammation, there is an increase in size and number of goblet cells. The mucus secreted by the paranasal sinuses is cleared by motility of the cilia, which are 50 – 200 per cell and they beat at the rate of 700 to 800 beats per minute, moving at the rate of 1cm per minute.²

In patients with CRS, the etiology being anatomical variants (leading to stasis of secretions), allergy, viral, bacterial and fungal infections, there is alteration in the quality and quantity of the secretions.

In CRS the purulent or mucopurulent discharge leads to alteration of the mucosal lining of pharyngeal end of ET with edema and inflammation of subepithelial lymphoreticular network, leading to blockage and obstruction of ET. This leads to reduced ventilation and changes in mucosal lining of the middle ear cleft. In present study normal ET orifice was seen in 18.07% cases of CRS, while in control group normal ET orifice was present in 74.69% subjects.

Jose Evandro Andrade Prudente de et al also did nasal endoscopy to study pharyngeal orifice of ET in patients having ear disease. Comparative chart showing alteration in ET ostium in Jose et al study and present study is depicted in table-2.

In present study all the patients were having CRS and that could be the reason for more number of subjects having changes at pharyngeal end. Status of nose and paranasal sinuses is not mentioned in their study.

Xia Z, Wang Z et al⁵ performed videolaryngoscopy to see morphological changes of pharyngeal ostium of the ET. In patients of CRS abnormal ostium was found in 80% cases.

Takahashi et al⁶ studied pharyngeal end of ET in secretory otitis media by nasal endoscopy in children and adults. In adults he found edema of the orifice (type II) in 26.9% cases, edema with mucopurulent discharge at orifice (type II) in 23.1 % cases and atrophy of orifice in 10.3% cases. While in children type II ostium, edema and discharge in 72.7% and only edema in 10.4%. Hypertrophy of peritubal tonsil (type III) in 16.9% children. Status of nose and PNS is not mentioned in his study also. We did not find any study mentioning direct relation of rhinosinusitis and morphological changes in pharyngeal end of ET.

Nasal endoscopy was repeated after treatment of CRS.⁷ In patients who came for follows up. We could not provide exact data regarding alterations at pharyngeal orifice of ET after treatment as number of patients were less at follow-up.

CONCLUSION

Chronic Rhinosinusitis is the most important focal sepsis causing changes at the pharyngeal end of Eustachian tube, in the form of mucosal edema, congestion and tubal tonsil hypertrophy. This results in blockage of tube. This in turn can lead to middle ear disease. Nasal endoscopy should be done in all the cases of CRS, to examine nose, nasopharynx and pharyngeal end of ET. This study does not encompass other diagnostic tests for Eustachian tube dysfunction, we suggest that Tympanometry should be done in all the cases in which changes of pharyngeal end of Eustachian tube is seen. We also recommend repeat nasal endoscopy after appropriate management of CRS. We conclude that chronic rhinosinusitis does alter the status of pharyngeal end of Eustachian tube.

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Autopsy Based Audit of Medical Intensive Care Unit Deaths - Two Year Study in Western India

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ABSTRACT

Introduction: Dissection and examination of a dead body along with its internal structures is known as autopsy or Post-Mortem. Autopsy rates have been declined worldwide, but recent retrospective intensive care unit (ICU) data indicate major discrepancies between more than 25% of clinical diagnosis. There is paucity of literature which correlate between clinical diagnosis made at autopsy, especially in patients in intensive care units (ICUs). Hence, we aim to correlate the clinical impression of the disease process with the histopathology based final cause of death in adult patients dying in medical intensive care unit (MICU).

Material and methods: 110 patients were included in this retrospective analysis. Only autopsies with age of 12 years and above were included in the study. The analysis was done to compare the ante mortem clinical diagnosis and post-mortem (PM) (final) cause of death to assess whether there were any discrepancies between these. Goldman classification was used to classify cases showing discrepancies between clinical diagnosis and final cause of death.

Results: Most common infectious cause of death in the present study was Pneumonia. Out of all non-infectious causes, the most common was death due to CNS involvement. Out of total 110 medical autopsies included in the study, autopsy rate in hospital varied between 23% to 37%. In 2011 there were 1480 total autopsies out of which 481 (32.50%) were pathological (Medical) where as 999 were medico legal autopsies.

Conclusion: Post mortem examination is crucial in identifying unexpected diagnosis even in patients receiving close monitoring and intensive care

Keywords: Autopsy, Post-Mortem

INTRODUCTION

Dissection and examination of a dead body along with its internal structures is known as autopsy or Post-Mortem. Indications of autopsy include determination of death's cause and observation and establishment of disease and mechanisms of disease process. The autopsy is derived from the Greek word "Autopsia", meaning "the Act of seeing for oneself". Autopsy technique is frequently used in describing newer diseases and assessment of newer methods in the operative and diagnostic fields.¹ For the care of acutely ill adult and geriatric patients, Medical Intensive Care Unit (MICU) has been formed. Severity of the illness of the patients decides the mortality rates in ICU. Studies quotes that mortality rate in ICUs have been reported to vary with reaching the maximum level upto 40%.² Autopsy rates have been declined worldwide, but recent retrospective intensive care unit (ICU) data indicate major discrepancies between more than 25% of clinical diagnosis.³ there is paucity of literature which correlate between clinical diagnosis made at autopsy, especially in patients in intensive care units (ICUs).⁴ Hence, we aim to correlate the clinical impression of the disease process with the histopathology based final cause of death in

adult patients dying in medical intensive care unit (MICU).

MATERIAL AND METHODS

This retrospective study was carried out in the pathology department at a tertiary care and referral hospital in Mumbai from January 2011 to December 2012. 110 cases of the medical autopsies of medical intensive care unit (MICU) deaths were included in the study. Only autopsies with age of 12 years and above were included in the study. Ethical approval was taken in written from the ethical committee of the hospital by pre-informing them about the study protocol. The clinical details recorded including—clinical history general and systemic examination findings, ante-mortem investigation, and treatment in brief. Pathological findings includes Gross and microscopic examination of important organs including Brain, Heart, Lungs, Liver, spleen, kidneys, pancreas and intestine. H and E staining method was used for microscopic assessment of autopsy specimens. The analysis was done to compare the ante mortem clinical diagnosis and post-mortem (PM) (final) cause of death to assess whether there were any discrepancies between these. Goldman classification was used to classify cases showing discrepancies between clinical diagnosis and final cause of death.

STATISTICAL ANALYSIS

SPSS version 21 was used to generate the tables. Descriptive statistics were used to infer results.

RESULTS

Out of total 110 medical autopsies included in the study, autopsy rate in hospital varied between 23% to 37%. In 2011 there were 1480 total autopsies out of which 481 (32.50%) were pathological (Medical) where as 999 were medico legal autopsies. In 2012, pathological autopsies were 415 (26.40%) out of 1572 total autopsies. Autopsy Rate in MICU patient was 27.77% 31.65% in 2011 and 2012 respectively. In our study maximum autopsies were performed in middle age group ranging from 21-40 years 67 (60.90%). The minimum age was 12 years. In general population, males outnumbered females, however in our study, females 73 (66%) were more

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than males. As the duration of MICU stay was considered maximum numbers of autopsies were performed in patients with MICU stay of > 48 hours (60%). The minimum MICU stay was 30 min and maximum stay was 45 days. There were total 37 (33.64%) cases of total study population that showed

discrepancy between the clinical diagnosis and PM. Findings. There were 73 (66-36%) cases of total study population where PM. findings were in agreement with clinical diagnosis. Table-1 shows the infectious cause of death. Most common infectious cause of death in the present study was Pneumonia. Out of all non-infectious causes, the most common was death due to CNS involvement as shown in Table-2. Table-3 highlights the Post-Operative Deaths. Figure-1 shows brain specimen prepared for autopsy. Figure-2 shows Millitary Tuberculosis associated infection in ICU Deaths.

DISCUSSION

One of the most reliable methods of validating clinical diagnosis is Autopsy. Diagnostic discrepancies between the frequency of ante-mortem to post-mortem have been investigated by various workers and have been reported to range from 6 to 60%. However, there are only few such studies in adult ICUs and are in the pediatric ICU.⁵ Majority of the autopsies 67 (60.90%)

Infections	Cases (n=38)	Percentage (%)
Septicaemia	7	18.42
Pneumonia	8	21.05
Malaria	1	2.63
Dengue/ Leptospirosis	4	10.53
Tuberculosis	6	15.79
Meningitis	2	5.26
Hepatitis	5	13.16
Myocarditis	2	5.26
Others	3	7.9
Total	38	100

Table-1: Infectious cause of death.

System wise Non-infection Causes of death	Number of cases (n=72)	Percentage (%)
CNS	20	27.78
Pregnancy related complication	13	18.05
CVS	11	15.28
RS	11	15.28
Hepatic System G I System	4	5.56
Hemolymphatic system	1	1.39
Renal system	5	6.94
Respiratory + Renal	5	6.94
Malignancy	1	1.39
Other (DIC and multiorgan failure)	1	1.39
Total	72	100

Table-2: Non-Infections causing death

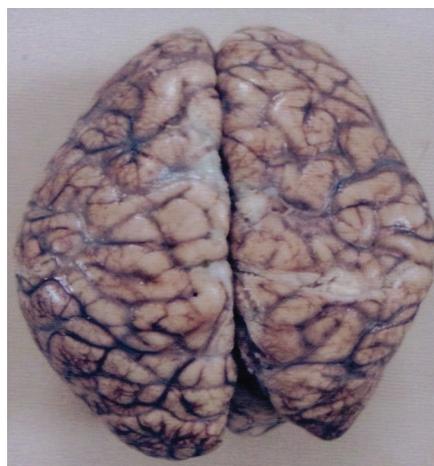


Figure-1: Brain specimen for autopsy

Operation Performed	Number of cases	Post-mortem cause of death
Clipping of intracranial	5	Raised ICT and haemorrhage
	5	Raised ICT and Cerebral edema
Aneurysm	2	Raised ICT and Cerebral infarction
CNS Tumours – Total Excision	3	Raised ICT and Cerebral edema
	1	Intracranial haemorrhage and cerebral infarction
	1	Respiratory failure following intrapulmonary haemorrhage
Decompression craniotomy	1	Raised ICT, cerebral edema, pyogenic meningitis and SDH
D12-L1 Decompression	1	ARF millitary TB in liver and spleen
D1-D4 Laminectomy excision of epidural tumor	1	ATN and Cerebral edema
Bronchial artery embolization	1	Respiratory failure and ARDS
Caesarean section	1	ARDS and DIC
	1	Sickle cell Crises
	1	Cardiac Failure due to rheumatic MS
Hysterectomy for fibroids	1	Renal failure
Incision and Drainage of Axillary abscess	1	Septicemia, Acute on Chronic Renal Failure
TIPS (shunt between portal vein and IVC) in case of BCS with Portal HTN	1	Pulmonary Embolism
Exploratory laparotomy and inter naliliac artery embolisation for broad ligament hematoma	1	Hypo-volumic shock, ATN and DIC
Expl. Laparotomy and obstetric hysterectomy for uterine rupture	1	Hypo-volumic shock following uterine rupture
Total	29	

Table-3: Post- Operative Deaths



Figure-2: Millitary Tuberculosis

in our study were in the age group of 21 to 40 years. Campion et al⁶ in their prospective study reported a significant drop in autopsy rate from 60% for those aged 16 to 34 yrs, to 23% for those aged > 85 Years in the Indian study done by sarode et al.⁷ maximum autopsies were performed in the age group 20-45 years (61.50%). This study is in comparison with this study but in comparison with the western world study done by Perkins et al⁸ which shows that maximum autopsies were performed in older age group i.e. 45years which shows discordance with this study. In our study majority of the autopsies were performed on females 73 (66%) as compared to males 37 (34%) material mortality is important issues and accounts for sizable number of autopsies in our institute as compared to study by Viktora D Mayer et al² and john Roosen et al⁹ which shows maximum number of males in their study population which is in discordant with our study. 72 cases out of all the subjects in our study, cause of death was non infectious origin and in rest 38 (34.55%) cases the cause of death was of infections origin. Similar results were obtained by Alan et al.¹⁰ Who observed non-infectious factors as the most common cause of death. Among the non infectious causes of death, maximum number constituting 20 (27.78%) cases were of CNS lesions. These findings comparable with study done by Calliope Maris et al¹¹ in their study also majority of patients were with neurological problems. There were 13 (18-05%) cases of death due to pregnancy related complications. This explains the increased ratio of female autopsies in our study. In our study, there were 29 post operative cases (26.36%) admitted in MICU. Majority of them were CNS lesions 18 cases and 5 cases were of obstetric complications. It is comparable with study by Calliope Maris et al,¹¹ which had 19.5% post-operative cases.

Out of 110 Cases the ante mortem impression and post-mortem diagnosis matched in 73 (66.36%) cases the overall discrepancies were found in 37 (33.64%) cases. There were 32 (29.9%) study population, which fall under major (Class I and II) discrepancy category in our study. Using Goldman system^{12,13} of classification of discrepancies such cases were classified into 4 groups. This finding comparable with many recent and old studies on MICU deaths. In our study, infections were the most commonly missed group of diagnosis 45-94% and formed the maximum class I discrepancies (12 cases) which is comparable with study by Nadrous et al¹⁴ with a total of 26

missed infection Calliope Maris et al also found infections as major missed diagnosis in their study. In this study tuberculosis was most common discrepancies, four cases of Goldman class I and two cases of Class II which is comparable with a study by Fabio Tavora et al¹⁵ found tuberculosis as major undiagnosed infection.

Pneumonia was missed twice in our study both were class I discrepancies which in concordance with study by Goldman et al.¹² All in their study bacterial pneumonia was missed infection and accounting for 26-29% also in a study by Petersen et al¹⁶ pneumonia was major missed diagnosis. In our study only one case of fungal infection of class I discrepancy which was missed clinically which is in concordance with study by Nadrous et al.¹⁴ also in concordance with study DU et al.¹⁷ Only one case of pyogenic meningitis which was class II discrepancy in a study by Hassani et al¹⁸ meningitis was missed in two out of forty three cases. Septicemia was missed in three cases (Two class I and One Class II discrepancy). There were two cases of acute myocarditis and both were class I discrepancies. Acute gastroenteritis – Class I discrepancy constituted one case. Complication of Acute febrile illness (AFI). In our study among non- infection cases maximum number of discrepancy cases was from cardio respiratory system which is comparable with study done by Alan Combes et al.³ They found 48 cases of misdiagnosis of Cardio respiratory system. In our study; we found two cases of pulmonary thromboembolism missed pulmonary embolism was the most prevalent discrepancy in studies done by Fabio Tavora et al.¹⁵ In our study one case in which IHD (MI) was missed clinically studies by Alan Combes et al,³ and Alan et al¹⁰ found MI linfar as major misdiagnosis. In our study we found 2 cases of cerebral edema under class I Goldman classification.^{12,19} Single case of lung adenocarcinoma with metastasis in liver and spleen was missed. There are two cases of Acute respiratory distress syndrome (ARDS) class II discrepancy. Acute hemorrhagic pancreatitis (class II discrepancy) was missed in a single case. There was one case in are study which was diagnosed as acute MI but on autopsy found to have aortic dissection (Class II discrepancy). There were no correlation found between duration of MICU study and discrepancies. From the above discussion factors contributing to discrepancies are mainly low sensitivity of investigation, low level of suspicion, Short duration of hospital stay (< 24 hrs), Atypical presentation disease, Inadequate or incorrect interpretation of clinical information provided by patients.

Limitation of Study

However, the present study had certain limitations. Post mortem examinations in the present study were indicated in only in those cases in which diagnosis was uncertain. Therefore, there may exist falsely high incidence of missed diagnosis. Goldman's criteria used in the present study, is not simple and straight forward procedure. Also discrepancies may arise as few autopsies performed in the present study were partial. This study is retrospective analysis and the diagnostic work up of each individual was not critically reviewed.

CONCLUSION

From the above results, it can be concluded that post mortem examination is crucial in identifying unexpected diagnosis even in patients receiving close monitoring and intensive care. The

post mortem examination should not be seen as a means of providing evidence of clinical malpractice rather as a positive educational tool to improve patient care in an attempt to reduce the number of clinically missed diagnoses. For patients dying in ICU, Autopsy should be considered.

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Pancytopenia – A study of Clinico-Haematological Profile in Adults with its Bone-Marrow Co-Relation in a Tertiary Hospital of Bihar

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Ran Vijoy Narayan Singh⁴

ABSTRACT

Introduction: Pancytopenia is characterized by reduction in all the three formed elements of blood i.e., RBC, WBC, Platelet. Disease varies according to age, nutritional status and geographical distribution. Aim of the study was to evaluate the etiological and clinico-haematological profile of patients with pancytopenia and to study the utility of Bone marrow examination.

Material and Methods: This was a five year retrospective study in a tertiary teaching institute of Bihar. 817 pancytopenic adult patients with age group between 18-82 years were studied. Their clinical workup, peripheral smear and bone marrow aspiration smears were meticulously analyzed.

Result: Megaloblasticaemia 31.9%, Acute leukemia 30.5%, Aplastic anaemia 29.9%, Kalazar 6.9%, Non-Hodgkin's Lymphoma (NHL) 0.48%, Multiple Myeloma (MM) 0.24% and Gauchers disease 0.12% were reported.

Conclusion: It is important to workup all cases of pancytopenia to treat the reversible diseases and to reduce mortality and morbidity in serious diseases.

Keywords: Megaloblasticaemia, Acute Leukemia, Aplastic anaemia, Kalazar

INTRODUCTION

Pancytopenia is common among patients attending hospital.¹ Pancytopenia by itself is not a disease but is the result of various diseases.² The presenting symptoms can be due to anaemia, leucopenia or, thrombocytopenia leading to fatigue, dyspnoea. Thrombocytopenia can lead to bruising and mucosal bleeding. Leucopenic features are uncommon as the presenting symptom, but during the course of the disease becomes a life-threatening condition.³ In pancytopenia, all the three formed elements of blood is reduced below the normal range.⁴ Pancytopenia may be due to different diseases and the disease varies according to geographical distribution and genetic difference.⁵

Etiology of pancytopenia can vary from transient marrow suppression due to viral cause to marrow infiltrating life threatening malignancy. So treatment modalities also varies.¹ Bone marrow aspiration plays a significant role in recognising the etiology of pancytopenia.⁶ Cause may be primary or secondary to bone marrow.⁷ Depending upon the disease entity bone marrow can be hypocellular, normocellular or hypocellular. Early diagnosis reduces the mortality and morbidity in the patients.⁸ Cause of pancytopenia can be from simple treatable disease to serious life threatening condition. So, it is important to evaluate these patients to provide them appropriate and correct treatment.

Aim of the study was to evaluate the etiological and clinico-hematological profile of patient with pancytopenia and to study the utility of Bone-marrow examination.

MATERIAL AND METHOD

This was a retrospective study carried out at the Department of Pathology of tertiary teaching Hospital from Jan 2011 to Dec 2015 for a period of 5 years. As this was a retrospective study no ethical issues were present. Patient consent was also not needed. A total of 1318 cases of pancytopenia were present out of which 817 were of adults and the rest children.

Patients above 18 years considered adults. Patients on chemotherapy and immunosuppressive treatment were excluded from the study. Clinical profiles of all patients and their complete blood counts including Haemoglobin concentration, RBC count and total and differential leucocyte count, platelet count, MCV, MCH, MCHC and PCV estimated by automated haematological cell counter. Reticulocyte count and findings of peripheral blood smear stained by Leishman stain was examined. Bone marrow aspiration was done and its slide was examined.

Sensitivity of bone marrow aspiration to diagnose pancytopenia was 99.6%. Only 2 cases of non Hodgkin's lymphoma and 1 case of gaucher's disease could not be diagnosed by bone marrow aspiration only. Special stains were needed for their diagnosis.

STATISTICAL ANALYSIS

Microsoft word 2007 was used to generate tables. Descriptive statistics were used to interpret results.

RESULT

A total of 817 cases were studied. Out of which 512 were male and 305 were female. Age was between 18-82 years with a mean age of 41 years. Pallor was the most common presenting symptom followed by fever and hepatomegaly. Table-1 shows the percentage of presenting symptom.

Our study showed that megaloblastic anaemia was the most common cause of pancytopenia followed by acute leukaemia and aplastic anaemia. There was one case of Gaucher's disease, four cases of Non-Hodgkin's Lymphoma (NHL) and 57 cases

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of Kalazar.

DISCUSSION

Pancytopenia may be due to varied condition and its etiology differs in different population, different methodology and diagnostic criteria, genetic difference, nutritional status, prevalence of infection and exposure to toxic drugs.⁴

Khunger et al in India study of 200 cases reported megaloblastic anaemia in 72%, aplastic anaemia in 14%.⁹ Savage et al in Zimbabwe studied 134 patients identifying megaloblastic anaemia to be the most common followed by aplastic anaemia and acute leukaemia. Our study also had similar pattern of disease distribution. Khan et al in Pakistan showed acute anaemia to lead followed by aplastic anaemia and then megaloblastic anaemia.¹⁰ Imbert et al in France studied 213 cases and found malignant myeloid disorder in 42%, lymphoid disorder 18% and aplastic anaemia 10%.¹¹ Jha et al in Nepal studied 148 pancytopenic patients and found hypoplastic bone marrow in 29%, megaloblastic anaemia 23.6%, haematological malignancy 23.6%.⁸

Common clinical presentation was pallor, fever, petechial haemorrhage, Organomegaly. Khan et al showed 81% cases with pallor followed by fever, then bleeding manifestation.¹⁰ This was similar to our study which show 97.9% pallor followed by fever and bleeding manifestation. Naseem et al showed fever (65.5%) most common followed by pallor and hepatomegaly.¹² Megaloblastic anaemia was diagnosed by examination of peripheral blood which showed macrocytes with hyper-segmented neutrophils. Due to retarded DNA maturation there is depression on all the series of cells. Bone marrow aspirate were hyper-cellular with increased erythropoiesis and presence of megaloblasts.¹³ Megaloblastic change is characterised by sieved nucleus chromatin, asynchronous nuclear maturation and bluish cytoplasm. Giant metamyelocytes are also seen. Megakaryocytes is depressed (Figure-1).

Aplastic anaemia were characterized by pancytopenia in peripheral smear and bone marrow showing hypocellular fatty patchy marrow.¹⁴ Aplasia can be congenital or acquired. Causes of hypoplasia were not evaluated in our study.

Acute leukaemia showed in peripheral smears to be sub-leukaemia leukaemia with reduced in all 3 type of cell. Blast were more than 20% in both peripheral and bone marrow aspirates.¹⁴ 172 cases were of acute myeloid leukaemia and 73 cases were of acute lymphatic leukaemia.

Kalazar cases showed pancytopenia in peripheral blood with increase plasma cell in marrow and *Leishmania donovani* (LD) bodies both intracellular and extracellular (Figure-2). NHL cases had lymphadenopathy with marrow infiltration. Multiple myeloma has typical osteolytic bone lesion with myeloma cell in marrow. One case of Gaucher's disease was also diagnosed. In our study, megaloblastic anaemia was found to be the commonest disease entity leading to pancytopenia in Bihar. Bihar is among the poorest of the poor northern state¹⁵ so, nutritional deficiency diseases are prevalent here. 40.69% of the people are below poverty line.¹⁵ Bihar has the highest fertility rate (3.7)¹⁶ and folic acid, which is an essential nutrient and its demand increases during pregnancy,¹⁷ leading to its deficiency and resulting in megaloblastic anaemia. As our Institute, despite being a tertiary care centre caters not only the need of referral

Symptom	No. of cases	%
Pallor	800	97.9
Fever	490	59.9
Petechial H'age	343	41.9
Lymphadenopathy	130	15.9
Hepatomegaly	482	58.9
Splenomegaly	343	41.9

Table-1: Showing the percentage of presenting symptom

Disease	No. of cases	%
Megaloblastic Anaemia	291	35.61
Acute leukaemia	245	29.9
Aplastic Anaemia	220	26.92
Kalazar	57	6.9
Non-Hodgkin's Lymphoma	4	0.48
Multiple Myeloma	2	0.24
Gaucher's disease	1	0.12

Table-2: showing distribution of etiological causes of pancytopenia

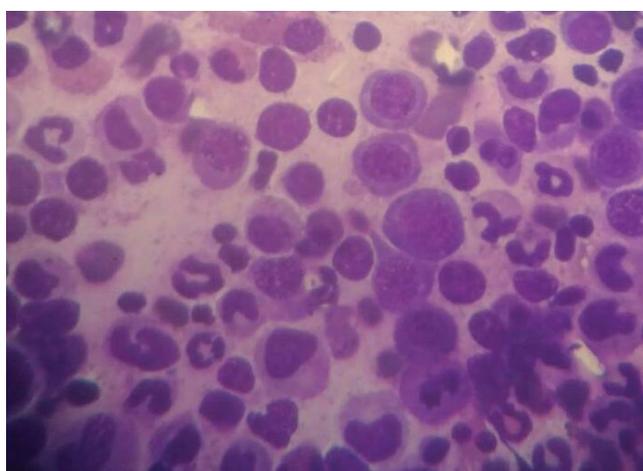


Figure-1: Bone marrow smears showing megaloblasts (Leishmanx400x)

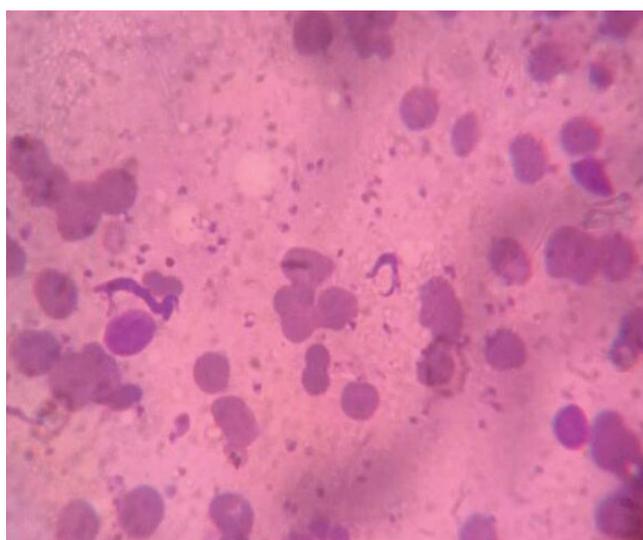


Figure-2: Bone marrow smears showing LD bodies (Leishmanx1000x)

patients, but also to the patients who common directly without any referral along with this, many free of cost services are provided to the economically backward sections of the society. So a large population, representative of the general population,

is encountered in our Institute.

CONCLUSION

Pancytopenia is a very common problem encountered in our setting. It mainly presents as weakness, fatigue and pallor. As its etiology is varied so peripheral blood smear and bone marrow aspiration helps us to make a conclusive diagnosis. Megaloblastic anaemia, which is a highly treatable disease, was found to be the commonest underlying cause of the pancytopenia among the adult population in Bihar. This can be attributed to the fact that the large segment of the population belongs to economically backward section. This together with the high fertility rate leads to high prevalence of nutritional deficiencies, which are fully treatable and preventable.

So, it is essential to work up all cases of pancytopenia so that curable disease can be segregated and treated. Rapid diagnosis also helps to reduce morbidity and mortality in serious disease by early intervention. Peripheral blood smear examination and bone marrow aspiration gives a fairly accurate diagnosis of pancytopenia in a short time period and may prevent unnecessary burden on already stressed laboratory in a developing country like ours.

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A Study on Aphthous Ulcer and its Association with Stress among Medical Students of an Indian Medical Institution

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ABSTRACT

Introduction: Aphthous ulcer or Recurrent aphthous stomatitis is one of the most common mucosal disorders of the mouth. The exact etiology of aphthous ulcer is uncertain, but precipitated factors include stress, trauma, food sensitivity, and genetic predisposition. Previous studies have suggested that stress and anxiety have a role in the onset and recurrence of aphthous ulcers. Study was aimed to estimate the prevalence of Aphthous ulcer among medical students and to find out its association with stress.

Material and methods: A cross sectional study on 106 medical students of an institution in Kerala was carried out. It was a questionnaire based study. Questionnaire contained questions about aphthous ulcers and questions on perceived stress by modified perceived stress scale. Statistical analysis was done using SPSS 20. Student t test and chi square test were used and a p value of <0.05 was taken as significant.

Result: The prevalence of aphthous ulcers among medical students was high (62.3%). Family history was significant among the ulcer experienced group (p=0.004). Perceived stress scores were high among the medical students especially among the ulcer experienced group (p=0.001). 49 students (46.2%) were under high stress out of which 39 were with ulcer.

Conclusion: Medical students show a high prevalence of aphthous ulcers. Study revealed that they are having increased stress which is more so in the ulcer experienced group which indicates that stress may be the precipitating factor for aphthous ulcer in the vulnerable group.

Keywords: Aphthous ulcer, Recurrent aphthous stomatitis, Perceived stress

INTRODUCTION

Aphthous ulcers or recurrent aphthous stomatitis (RAS) are common inflammatory lesions of the oral mucosa. The estimated prevalence of oral ulcers worldwide is 4%, with aphthous ulcers being the most common, affecting as many as 25% of the population worldwide.¹

RAS occurs usually in the non-keratinized areas like lips, ventral surface of the tongue, buccal mucosa, floor of the mouth and soft palate.² They are usually painful, shallow round ulcers with an erythematous halo covered by a yellowish-gray fibromembranous layer.³ Stanley classified RAS into 3 types.⁴ Minor, Major and Herpetiform ulcers. 80% of RAS are minor RAS or mild aphthous ulcers. They are small ulcers of 8-10mm size, 1 to 5 in number, affecting nonkeratinised oral mucosa and heal in 10-14 days without scarring. Major aphthous ulcers (10-15% of RAS) are larger than minor ones (>1cm) and may involve the keratinised oral mucosa such as the hard palate, fauces etc. They may take up to 6 weeks to heal and often leave a scar. In Herpetiform ulceration, there are groups of small ulcers more than 10, may be up to 100 in number of 1-3mm in diameter. These ulcers may coalesce to form large ulcers and last for about

10-14 days and most of them heal without scarring even though they have a potential to scar.³ This variant is commonly seen in women and has a late onset when compared to other variants.⁵ The etiology of RAS is uncertain, and both environmental and genetic factors are indicated. The precipitating factors include stress, physical or chemical trauma, infection, allergy, genetic predisposition, or nutritional deficiencies.^{6,7} Studies of Ship et al⁸ and Miller et al⁹ showed association between RAS and stress whereas studies of Ferguson et al¹⁰ and Heft and Wray¹¹ did not show any association between them. Studies reveal an increased prevalence of RAS in students and also with higher level of education. This finding supports the role of stress and anxiety in occurrence of RAS among educated patients, especially during the time of examination.

How the stress causing RAS is not fully understood. It has been suggested that increased levels of salivary cortisol or of reactive oxygen species in the saliva initiates the lesions.^{12,13} A genetic alteration of pathways linked to stressful responses may also be involved.¹⁴ RAS has also been linked to immune system changes, namely the modifications that affect multiple immune system components like the distribution, proliferation and activity of lymphocytes and natural killer cells, phagocytosis, and production of cytokines and antibodies which may partially explain the role of stress in the etiology of RAS.^{13,14}

Study was aimed to estimate the prevalence of Aphthous ulcer among medical students and to find out its association with stress

MATERIAL AND METHODS

A cross-sectional study was carried out among 106 medical students of Azeezia Institute of Medical Sciences and Research, who are about to complete their first and second year of MBBS. The study was conducted in March 2015. After getting ethical clearance, an informed consent was taken from the participants and sampling was done using systematic random sampling method. Those students who were having serious systemic illnesses or taking medication which causes immunosuppression like steroids were excluded from the study. The data were collected using questionnaires. The questionnaires had two

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sections. The first section contained personal information and questions related to aphthous ulcers, such as ulcer experience, number of episodes in the last 1 year, number of ulcers in each episode, duration of each episode, site of ulcer, symptoms and remedial measures, associated conditions, self-reported periods of stress, tobacco consumption and family history.

The second part dealt with 10 questions about perceived stress using a modified perceived stress scale (PSS) by Cohen.¹⁵ It consists of four positively stated items (items 4, 5, 7, and 8), the responses of which are reversed (e.g., 0 = 4, 1 = 3, 2 = 2, 3 = 1 and 4 = 0) and they are added to the responses of the rest of the items which gives an overall stress score. Stress scores in those with or without aphthous ulcers were compared.

STATISTICAL ANALYSIS

Statistical analysis was done using student t test and Chi square test with the SPSS 20 version software.

RESULTS

Study was carried out in 106 medical students out of which 62.3% (66 students) reported that they had experienced oral ulceration (Figure-1).

Among those who complained of ulcer episodes, 14 were suffering at the time of the study, 11 of them had ulcer 1 month back, 16 of them between 3 and 6 months and 25 of them had more than 6 months back (table-1). Frequency of ulceration was once in 6 months for majority (37) and the rest used to experience it on once in a month to once in 3 months duration (table-1). Majority (56) were having a single ulcer during each episode and lasting for 3-5 days (41). Predominant area of occurrence was cheek (33) followed by lips and gums (12 each). Slight (41.6%) to moderate pain (37%) was frequently observed. Majority of the participants did not take any medication (38) whereas a good proportion (20) had used vitamins and topical gels and very few had sought some home remedies (8). None of them were exposed to tobacco in any form. Positive family history was reported by about 19% of the study participants which was statistically very significant ($p=0.004$). Out of the 66 participants who experienced ulcer, 43 were females and 23 were males. It did not show any significance statistically ($p=0.805$). Among the 106 participants, 78 reported to have some form of stress out of which 24 (15 with ulcer and 9 without ulcer) had exam as the main cause of stress. For 9 (6 with ulcer and 3 without ulcer) of them change of food, 6 (5 with and 1 without ulcer) of them loss of near and dear ones and 24 (19 with and 5 without

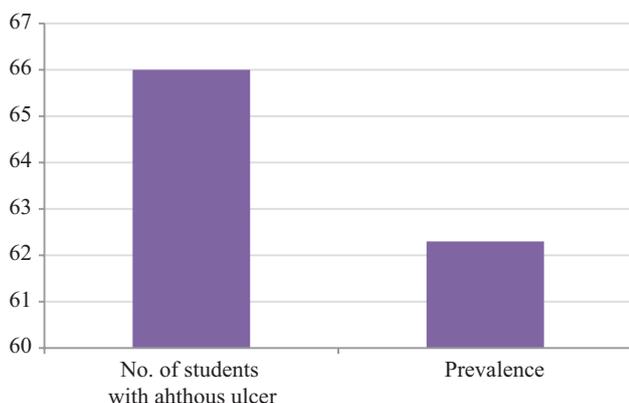


Figure-1: Prevalence of aphthous ulcer among medical students

ulcer) of them 2 or more of these were the causes of stress. For 16 of them none of the above mentioned were the cause for the stress (figure-2). There was no statistical significance noted between self reported stress among ulcer-experienced and ulcer-nonexperienced individuals ($p=0.337$). Statistical analysis did not show any significance between ulcer and cause of stress ($p=0.092$). 21 students with ulcer reported to have an associated vitamin deficiency and 4 of them had associated fever and gastric ulcer 2 had skin problems. But in majority of them (31 with ulcer and 28 without ulcer) it was not associated with any other conditions. On statistical analysis it was found significant with a p value of 0.008 which indicates that aphthous ulcer is not associated with any other conditions. When PSS scores of ulcer experienced individuals were compared with that of ulcer-nonexperienced group, it was statistically very significant

Factors associated with aphthous ulcers			
Aphthous Ulcer experience		Number	%
Time of last ulcer	Experiencing presently	14	13.2
	1 month	11	10.4
	3 months	8	7.5
	6 months	8	7.5
	>6 months	25	23.6
Frequency of ulceration	Once in a month	15	14.2
	Once in 3 months	14	13.2
	Once in 6 months	37	34.9
No. in each episode	1	56	52.8
	3-6	9	8.5
	>6	1	0.9
Duration of the ulcer	0-2 days	18	17.0
	3-5 days	41	38.7
	6-10 days	7	6.6
Area of occurrence	lips	12	11.3
	cheek	33	31.1
	gums	12	11.3
	tongue	2	1.9
	Multiple areas	7	6.6
Medication	Vitamins/topical gels	20	18.9
	Home remedy	8	7.5
	No medication	78	73.6
Associated with any condition	Fever	4	3.8
	Skin problems	2	1.9
	Gastric ulcer	4	3.8
	Repeated infections	1	0.9
	Vitamin deficiency	21	19.8
	Diabetes mellitus	0	0
	Hormonal change	0	0
	Trauma	0	0
	Other conditions	2	1.9
	none	31	29.2
Family history	Yes	18	17.0
	No	48	45.3
Associated with stress	Yes	51	48.1
	No	14	13.2
Form of stress	exam	24	22.6
	Loss of near and dear ones	6	5.7
	Change in food	9	8.5
	Others	16	15.1
	Multiple reasons	24	22.6

Table-1: Factors associated with aphthous ulcers

($p=0.001$) which showed that the perceived stress scores were high among the medical students especially among the ulcer experienced group. 49 students (46.2%) were under high stress according to perceived stress scale out of which 39 were with ulcer. 40 students (37.7%) had stress in the average range, but among them 21 were with ulcer and 19 without ulcer (figure-3).

DISCUSSION

In the present study the prevalence of aphthous stomatitis was 62.3% (figure-1). Similar studies have been reported from India as well as other countries. Studies of Handa et al from Jaipur reported a prevalence of 26% and a study of Naito et al from Japan revealed a prevalence of 31%.^{16,17}

As our study population was medical students, we can attribute this high prevalence rate of aphthous ulcer in this study to stress because compared to other professional courses medical students endure more stress due to the nature of the medical curriculum. Apart from that students appear to be under some stress due to the fear of impending exams or compulsion to complete assignments given. In this study 46.2 % (49 students) of the students were under high stress as indicated by the high PSS score (figure-3). There are a number of studies suggesting association of anxiety, depression, and psychological stress with RAS.^{9,18,19} Huling LB, recorded daily stress of events in 160 cases of patients of RAU through telephone follow-up,¹³ which found that stressful events may involved in initiation of new RAS episodes. On the contrary study of Pedersen A on 22 patients in 1989 found no association between stress and RAU and concluded that standardized circumstances are needed to demonstrate such associations using increased keratinization of the oral mucosa.²⁰

There are studies showing the role of stress in the development of RAS especially in those who have an underlying anxiety trait.^{12,21,22} A report by Kasi PM et al in 2007 showed that significant levels of stress were identified among medical graduates, which led to their management of stress using negative coping mechanisms.²³ As a result of stress habits like biting the cheeks and lips may develop which will injure the oral mucosa and cause oral ulcers.

In our study none of the students reported to be using tobacco. This is not completely reliable because the students may not have revealed the history of smoking for fear of scrutiny by faculty. It has been suggested that cigarette smoking prevents aphthous ulcers, and it has been proposed that a component of tobacco which is systemically absorbed might be responsible for protecting against aphthous ulcer. Smokeless tobacco was found to be protective, suggesting nicotine as the protective factor.²⁴

Among the participants, females had higher RAS prevalence compared to males, which is similar to study reported by Handa *et al.*, where females are more commonly affected than males.¹⁶ The Mean stress scores of females were more compared to males in this study, which is similar to study reported by Singh et al²⁵ in which female nursing students perceived more stress than male students.

In the present study even though there was increased stress among medical students we could not find a difference in stress experienced between first year and 2nd year MBBS students. This is in contrary to the studies of Handa et al¹⁶ and Singh et

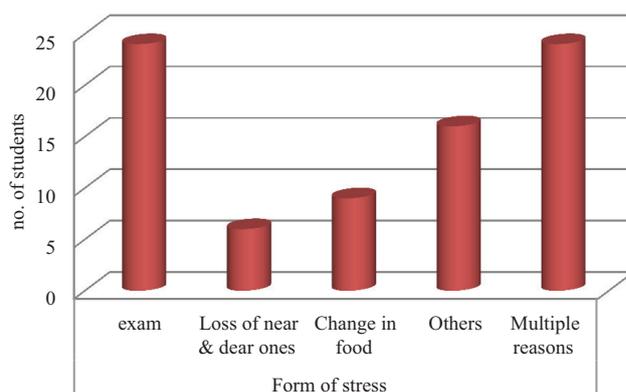


Figure-2: Form of stress among medical students with aphthous ulcers

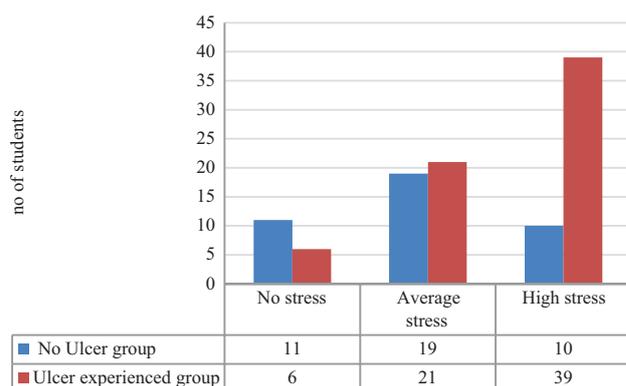


Figure-3: Relation between aphthous ulcer and stress according to PSS score

al²⁵ who reported that higher class students felt more stress when compared to juniors. The reason for increased stress among 1st year students may be because first year is a transitional period from school to professional education and they are finding it difficult to cope up with the vast curriculum.

Recurrent aphthous ulcers occur commonly on areas like the buccal mucosa and labial mucosa, floor of the mouth, ventral surface of the tongue and soft palate.²⁶ In majority of the participants (33) of the present study, the ulcer was observed on the cheeks. Majority (56) were having a single ulcer during each episode and lasting for 3-5 days (41 students). Similar observations were seen in the study of Safadi in 2009 in a study on Jordanian dental students who noticed that two – thirds of the subjects, ulcers lasted for less than a week.²⁷

In our study 38 of them did not take any treatment measures. But a good proportion of the participants (20) were resorted to the vitamin supplements and topical gels as majority of the clinicians prescribe these during ulcer episodes and a few of them the home remedies (table-1). A statistically significant relation was seen between family history and ulcer ($p=0.004$). It has been proposed that patients with a positive family history of RAS may develop oral ulcers at an earlier age and have more severe symptoms than those with no such history.^{28,29} We should aim to decrease the symptoms when treating and also to prolong duration of ulcer free periods. Patients should also be advised to maintain good daily oral hygiene. Measures should be taken to decrease the stress among medical students which not only decrease their suffering but also improve their academic performance.

CONCLUSION

In this study we found that prevalence of aphthous ulcers was high among medical students and the self reported stress was also very high among them. When we evaluated with modified perceived stress scores (PSS), we found a significant association between stress and aphthous ulcer which was confirming the above said finding. As it is clear about the high stress among medical students, some interventions are required to reduce the stress among medical students.

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Laparoscopic Versus Open Appendectomy: An Analysis of the Surgical Outcomes and Cost Efficacy in a Tertiary Care Medical College Hospital

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ABSTRACT

Introduction: This study aimed to compare the surgical outcomes and cost efficiency of laparoscopic versus open appendectomy.

Material and Methods: A retrospective analysis of 100 patients who underwent appendectomy in a Medical College Hospital from January 2011 to June 2015 was undertaken. Patients were divided into two groups of 50 each, and variables were analyzed including patient demographic data, operative time, duration of post operative pain and hospital stay, post operative complications and total costs. The results were analyzed by using statistical package for social services (SPSS, version 11.0, Chicago IL), Students t test, Chi square or Fischer's exact test as appropriate.

Results: Laparoscopic and open appendectomy were performed in 50 patients each. There was no statistical significance ($p=0.8293$) in the mean operative time (LA=73.36 mins, OA = 63.67 mins). Mean duration of postoperative pain was much less for the laparoscopic group (1.81 days) and statistically significant ($p=0.0014$). The incidence of complications was much lower after laparoscopic surgery (4%) in comparison to open surgery (12%). Length of hospital stay was significantly lesser ($p=0.0010$) while mean total cost was significantly higher ($p=0.0001$) in the LA group.

Conclusion: As laparoscopic appendectomy is associated with fewer complications, shorter hospital stay, almost similar operative time, lower rate of intraabdominal abscess and marginally higher cost of treatment when compared to open appendectomy, it can be recommended as the preferred approach of treatment for acute appendicitis.

Keywords: Laparoscopic appendectomy (LA), open appendectomy (OA), complications, hospital stay, operative time, overall costs

INTRODUCTION

Appendicitis is the most common cause of surgical abdomen in all age groups¹ with a lifetime risk of 6%.² Open appendectomy (OA), first described in 1894 by McBurney, performed through the right lower quadrant muscle splitting incision has for long been applied as the Gold standard procedure.³ This procedure has mainly remained unchanged for about 100 years due to its favorable efficacy and safety.

In 1983, Kurt Semm, a German gynaecologist, introduced the use of laparoscopic techniques with the first large study of laparoscopic appendectomy (LA) reported by Pier et al in 1991.^{4,5} Although initially a controversial procedure, accumulating evidence supports the use of laparoscopic appendectomy for the treatment of appendicitis.^{2,6} The putative advantages of laparoscopic approach are quicker and less painful recovery, early oral intake, fewer postoperative complications and better cosmesis.⁴ It also allows better assessment of other intra abdominal pathologies.

But nevertheless, its superiority over OA is still being debated as most of the advantages are of limited clinical relevance due to the small sample sizes and the high risk of type II errors (failing to observe a difference when in truth there is one).⁷

Intra-abdominal abscesses are a concern when performing laparoscopic appendectomies in case of complicated appendicitis. A meta analysis conducted on children with appendicitis revealed that intra abdominal abscess formation was more common following LA, although this was not statistically significant.⁸ In adults, LA has been associated with a higher rate of intra abdominal abscesses with a consequent higher rate of readmission and interventions.⁹ However one study using a nationwide inpatient sample database in the US revealed that laparoscopic appendectomies were associated with lower morbidity, lower mortality, shorter hospital stay and a reduction in hospital charges.¹⁰

This retrospective study was aimed at comparing the treatment outcomes between LA and OA, and to determine the feasibility of LA especially in terms of safety, duration of hospital stay and cost effectiveness in the setup of a Medical College Hospital where most of the patients belong to the lower socioeconomic strata.

MATERIALS AND METHODS

This retrospective study was conducted in a tertiary care medical college hospital between January 2014 and June 2015 with a follow up period of 6 months. Ethical clearance was obtained by the Ethics Committee of the institute before commencement of the study. 100 patients reporting to the surgical OPD with features of acute appendicitis were included in our study, excluding patients below 12 years, pregnant women, patients unfit for GA/laparoscopy and those having generalized peritonitis. After obtaining an informed consent, all patients were subjected to a preoperative work up including routine investigations, USG abdomen, erect X ray abdomen, renal and liver function tests as well as any other tests required by the anesthesiologists. The subjects were then randomised into the open appendectomy and laparoscopic appendectomy groups, comprising of 50 patients each. All patients received one preoperative course of

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antibiotics (3rd generation cephalosporin or fluoroquinolone with Metronidazole) and were taken up for surgery under GA only.

Surgical techniques for open/ conventional appendicectomy

Surgery was done either through McBurney’s muscle splitting or Lanz’s skin crease incision. Appendix was identified, mobilised, mesoappendix ligated, appendix removed and base was transfixed.

Surgical techniques for laparoscopic appendicectomy

Surgery was done using three ports - one 10 mm at the umbilicus and two 5 mm ports in the suprapubic and left iliac regions. After identification of appendix, base was clamped using 2 endoclips and appendix divided.

All specimens were sent for histopathological examination. All patients were observed in the postoperative ward for 24 hours, and then shifted. Oral feeding was commenced on appearance of bowel sounds. Wounds were dressed on second postoperative day and sutures removed on the 7th postoperative day (in uninfected wounds). Discharge, in case of uncomplicated patients of open surgery was done as per patient’s preference but at least after completing one bowel movement. All patients underwent minimum of 2 follow-ups - first after 1 week and 6 months later.

Comparable data was tabulated and analyzed statistically to reach a conclusion regarding the surgical outcomes of both procedures.

STATISTICAL ANALYSIS

The data was analyzed using Statistical package for social services (SPSS, version 11.0; Chicago IL, USA). Continuous variables like age, hospital stay and operative duration were presented as Mean + SD, while categorical variables such as gender and postoperative complications were expressed as frequency and percentages using 95% confidence interval.

Student’s t test was used to compare the means of continuous variables while categorical variables were compared using Chi-square or Fischer's exact test, as appropriate. Probability equal to or less than 0.05 (p<0.05) was considered significant.

RESULTS

Of the 100 patients included in the study, 50 (50%) patients underwent open surgery and 50 (50%) patients underwent laparoscopic surgery. There was one conversion to OA (2%) because of dense adhesions. One case of OA (2%) was converted to midline incision, as appendix could not be identified through Gridiron incision.

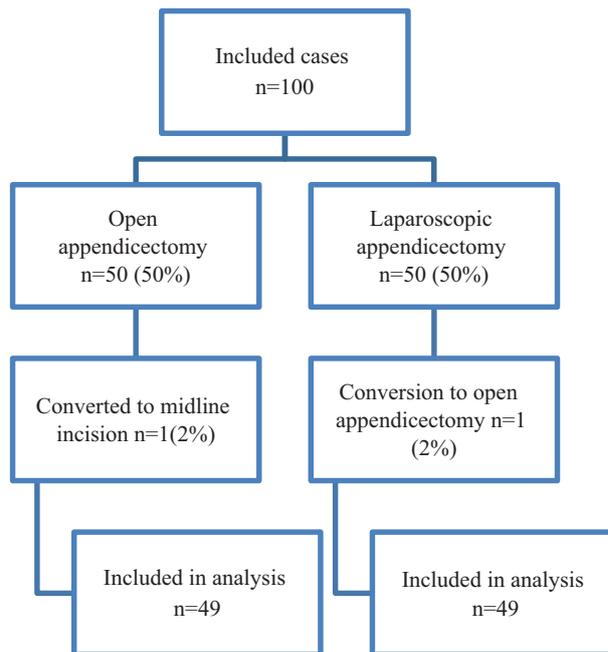


Figure-1: Study profile

	LA Group (n=50)	OA Group (n=50)	p value
Mean age (in years)	25 (18-46)	24 (18-50)	1.000
Gender			
Male	25 (50%)	27(54%)	1.000
Female	25(50%)	23(46%)	1.000
Total count (in cells/cumm)			
Uncomplicated cases	12.3(4.8-25.5)	13.2(4.9-22.6)	0.812
Complicated cases	20.2 (4.8-25.5)	20.5(4.9-22.6)	0.826
Intraoperative findings			
Inflamed appendix	49 (98%)	44(88%)	0.827
Gangrenous appendix	1 (2%)	3(6%)	
Perforated appendix	0	1(2%)	
Meckel’s diverticulum	0	1(2%)	
Intestinal worms	0	1 (2%)	

Table-1: Patient demographics and presentation

	LA Group	OA Group	Difference	P value
Mean operation time (in minutes)	73.36	63.67	9.69	0.8293
Mean duration of postoperative pain (in days)	1.81	4.79	-2.98	0.0014*
Post operative complications rate	4%	12%	-8%	1.000
Mean hospital stay (days)	3.65 (2-7)	6.87(3-12)	-3.22	P=0.0010 *
Mean total cost (Rs)	17079	11766	5313	0.0001**

*Statistically significant; ** Highly significant

Table-2: Clinical outcomes

Demographic Profile

Patients from both the groups were found comparable in terms of age, gender, clinical presentation and investigative findings. Of the total operated patients, 52 were males (52%) and 48 were females (48%). The age ranged between 18 and 50 years in the OA group (mean- 24 years) while similarly the laparoscopic patients were between 18 and 46 years (mean- 25 years).

All patients presented with right iliac fossa pain with 23 % having fever and 28% having vomiting. All three cardinal symptoms of pain, fever and vomiting were seen in only 10 %. 60 % of the patients had a total leucocyte count above 11000 cells/cu mm. (normal reference range: 4000-11000 cells/cu mm). While in the other 38% patients, although the total count was within normal range, diagnosis of acute appendicitis was based on clinical suspicion and USG confirmation. Hence in this study, a raised total count had a sensitivity of 61.22% (CI: 0.50-0.70). However, all patients who subsequently had a gangrenous or perforated appendicitis had a significantly higher total count (> 16000 cells/cumm). Hence total count, though a useful marker, can provide only a clue to the diagnosis and a normal count can by no means preclude the diagnosis of acute appendicitis.

On USG abdomen, the typical finding of “an aperistaltic blind ending noncompressible tubular structure” was present in 62 % patients while only probe tenderness was detected in 6% patients and appendix was not visualized in 29% patients. Even in inconclusive patients, surgery was performed based on elevated total count and clinical diagnosis. Hence USG alone as a means of diagnosis had a low sensitivity in this study.

Intraoperatively, 44 patients in the open group (88%) and 49 patients (98%) in the laparoscopic group showed inflamed appendix, while a total of 4 patients (4%) had gangrenous and one patient (1%) had perforated appendicitis. 2 patients of the open group (4%) had a concomitant pathology of Meckel's Diverticulum and intestinal worms, with diverticulectomy and evacuation of worms done respectively (Table-1).

Surgical Outcomes

The mean operative time was 63.67 minutes (range: 50-150 minutes) for the OA group and 73.36 mins (range 60-180 mins) for the LA group, with no statistically significant difference ($p=0.8293$). The longest duration of time in LA group was in the single case of conversion (2%) due to dense adhesions between appendix and caecum and in the OA group (2%), which was converted to midline incision due to non-identification of appendix through the McBurney's incision. The patients of the LA group had significantly lower duration of postoperative pain (mean - 1.81 days) compared to a mean of 4.79 days in the OA group. This finding was statistically significant ($p=0.0014$).

There was no mortality during this study but we had a total postoperative morbidity of 8 % (8 cases). 5 patients (10%) had wound infection and one (2%) patient with intra abdominal abscess (all in the OA group), were all managed conservatively. The only complications seen in the LA group were 2 (4%) patients with paralytic ileus. All values were not statistically significant ($p=1.0000$).

Mean hospital stay was found to be statistically shorter ($p=0.0010$) for the LA group (Mean 3.65 days) in relation to the OA group (Mean 6.87 days). 97 % of patients resumed normal lifestyle after removal of sutures. The mean expenditure

at the time of discharge of the OA group was Rs 11, 766 (SD-Rs 403.25) whereas for the patients of the LA group, the mean expenditure was Rs 17079 (SD-Rs 463.41). With the p value <0.0001 , it was found to be statistically highly significant. 3 patients (6%) of the OA group had to be readmitted after discharge of which 2 patients (4%) had purulent discharge from scar (treated conservatively for 7 days with daily dressing and iv antibiotics) and one patient (2%) reported 18 months after surgery with features of intestinal obstruction. This patient underwent laparoscopic adhesiolysis and was discharged after 7 days.

DISCUSSION

Excellent results following laparoscopic appendectomy and easier availability of instruments for laparoscopic surgery in recent years has made laparoscopic appendicectomy a popular choice of surgery amongst many patients for both simple and complicated cases of acute appendicitis. The rate of LA between 1998 and 2008 increased from 20.6% to 70.8%, becoming the prevalent approach to treat acute appendicitis since 2005.¹¹

In addition to the clinical benefits described in several studies, the laparoscopic approach allows a full exploration of the peritoneal cavity,¹² thus representing an important diagnostic tool in case there is only suspicion of acute appendicitis. Several diseases like PID, endometriosis, ovarian cysts, ectopic pregnancy, cholecystitis, colonic perforation may mimic appendicitis.¹³ A definitive diagnosis is obtained in 96% of patients undergoing LA compared with 72% of those undergoing open procedures.¹⁴ LA has been proposed as a preferred technique in obese patients and in elderly patients.¹⁵ In these patients, the laparoscopic approach is associated with reduced hospital stay, less post op morbidity and lower cost compared to open approach.

Despite the obvious advantages described, the advantage of LA still remains a matter of debate because of concerns about possible longer operative time, higher rate of post op intra abdominal abscesses and higher costs compared to OA. Because of all of the above, the open approach appears to be still widely used in clinical practice.

In the present study, the duration of both LA and OA were comparable (difference of 9.69 minutes) which was not found to be statistically insignificant. This can be attributed to the fact that being a teaching hospital all open surgeries were performed by surgical residents under supervision and all LA were done by experienced specialists. The longer duration of laparoscopic surgery can be explained by the fact that LA involves additional steps of gas insufflation, trocar entry and diagnostic confirmation and technically more complex dissection in case of complicated appendicitis. A world wide spread of training in lap technique lead to a significant reduction in difference of operative time compared to open procedures after 2000, as evidenced by several meta analyses.^{16,17}

In the present study, pain was assessed both subjectively and objectively by the tabulation of analgesic use. Several studies have reported less pain in the first 48 hours after lap appendectomy.^{18,19} and in our series too, the same observation was made throughout the hospital stay. Smaller incision and minimal tissue handling maybe the reason for decreased post operative pain perception in LA. Another interesting observation has been the patient's perception of pain after appendectomy.

In one study done by Ortega et al,²⁰ linear analogue pain scores were recorded in 135 patients blinded to the procedure of operation by special dressing and pain score was very less in lap group compared to open. Those who underwent lap appendicectomy were more vocal of pain although it was of a lower intensity. This could have risen from the explanation that laparoscopic procedures are painless or a lower level of endorphins is released or due to lower peritoneal injury from pneumoperitoneum.

Our results showed an overall 3.49-day reduction in recovery time for LA compared to OA (p= 0.0022). Early return to full activity is accepted as an obvious advantage of LA, which was supported by a large-scale Meta analyses conducted by the Cochrane colorectal Cancer group review.⁷ The trocar incisions of LA contribute to minimum trauma to the abdominal wall and less pain, allowing faster recovery. A trend towards less difference in return to normal activity was noted in studies done before and after 2000.²¹

The present study confirmed a significant lower incidence of post operative complications in the patients treated by lap approach (4.08% versus 12.24% for OA cases). These results are in agreement with previous reports, which vary from 5.7% to 25.8% for OA and 3% to 19% for LA.^{7,18,22}

Although the infection of surgical wound is not per se a life threatening condition, it worsens the quality of life in the early postoperative period and prolongs the convalescence and recovery time. In our study, there was not a single case of wound infection after LA and most of the literature supports this view.¹⁷ The extraction of specimen with a bag through a trocar port rather than directly through the surgical wound as in OA can explain this reduction in incidence. Moreover the smaller size of the laparoscopic incisions reduces the probability of infection especially in obese patients

The occurrence of intra abdominal abscess after LA represents a potentially life threatening event. Several meta analyses of randomized controlled trials published in recent years.^{7,16,17} have shown an increased risk of intraabdominal abscess after LA. This may be attributed to improper laparoscopic techniques; CO 2 insufflation may promote mechanical spread of bacteria in peritoneum, aggressive handling of infected appendix, use of irrigation fluids leading to contamination of peritoneal cavity. In this study, however, no patient in LA group and one patient in OA group developed intra abdominal abscess, the difference being statistically insignificant. Three possible causes of our results in this aspect maybe because of the small sample size, only one case of perforated appendix and higher laparoscopic skills of experienced surgeons.

In this study 4% of patients in the LA group and no patients in the OA group developed paralytic ileus, which did not reach statistical significance. This finding is mirrored in other studies. But some studies have reported statistically significant post operative ileus in the LA group due to reduced manipulation of the ileum and the caecum in the hand of a skilled surgeon, minor abdominal trauma and less pain due to the small incisions of the trocars.^{17,23}

Post operative ileus along with pain and wound infection may hamper the mobility of the patient, in turn prolonging the hospital stay and increasing the cost of the treatment. The study shows that the length of hospital stay was 3.49 days for LAP

patients (P=0.0022), which was statistically significant. The result is comparable to the results of Wei et al and other recent cohort studies.²⁴⁻²⁶

This reduction of length of hospital stay has a direct impact on costs. Although the cost of LA is higher than OA, the difference in total cost between the two procedures is decreased by shorter length of stay and earlier return to work life.²⁷

The debate about cost comparison between the two groups still exists, and our study too found that LA cost the patients approximately Rs 5313 higher than OA (which was statistically highly significant, p=0.0001). Heikkinen TJ et al²⁸ reported a randomized study for cost effectiveness of LA while Wei et al²³ in their meta analysis including 8 RCTs performed an analysis of the costs across different countries and age groups using the hospital cost ratio to compare. The total hospital costs for LA were 11% higher (for both simple and complex cases) than OA but the difference was not found to be statistically significant. Though the overall costs were higher, significant cost savings were seen due to rapid convalescence and because of no hidden costs as seen in the OA group due to longer hospital stay, cost of treatment of complications and readmission, delayed return to livelihood and loss of earnings.

In our study, there were 3 cases (all from OA group) of readmission in the follow up period during the course of the study. Two were cases of wound infection discharged after antibiotics and dressings, and the third was a case of small bowel obstruction (needed laparoscopic adhesiolysis). Reports show that incidence of small bowel obstruction is as high as 2.8%²⁸ as opposed to 1 % in our study, and equal in both groups. Our lower incidence may be due to insufficient follow up period (onset is described commonly in first 4 years after surgery).

The limitation of our study is its retrospective nature. The follow up period was limited to only 6 months postoperatively. Hence we could only focus on immediate and primary outcomes, and could not take into account the long-term complications (like obstruction and incisional hernias), and their effect on health care costs. Due to restriction of time, the sample size was small compared to other studies. Our hospital caters mostly to patients belonging to low socio-economic strata; hence bias on the choice of treatment could have affected some of the results. Surgical residents performed most of the surgeries in OA group in comparison to senior surgeons operating in the LA group. So some of the outcomes of the OA group could have been affected due to the learning curve.

CONCLUSION

In our study, we compared the outcomes between laparoscopic and open appendicectomy for treatment of acute appendicitis in a Medical College Hospital. Laparoscopic surgery was found to be superior in terms of lesser post-operative pain, shorter hospital stay, fewer wound infection and cases of intra-abdominal abscess. The length of both procedures was not significantly different and fewer readmissions were seen in the LA group.

The only disadvantage of LA was the marginally higher cost to OA group, but the hidden costs increases the total cost of treatment in OA group both in terms of expenditure and delayed return to work.

Our study has proved that provided surgical experience and

equipments are available, laparoscopic appendectomy is safe and equally efficient compared to the conventional technique and can be recommended as the preferred approach for the treatment of acute appendicitis.

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Evaluation of Factors Responsible for Failure of Exclusive Breast Feeding for First 6 Months-Hospital based Study

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ABSTRACT

Introduction: Exclusive breast feeding (EBF) is an essential part of early infant feeding. Promotion of EBF is the single most cost-effective intervention to reduce infant mortality in developing countries. However in India, a large number of infants are not exclusively breast fed as per infant feeding recommendations. Understanding the factors influencing EBF is crucial to promote this essential feeding policy in infancy. This study was carried out to identify factors affecting EBF among mothers attending Government General Hospital of a Tertiary care centre.

Material and Methods: Hospital-based cross-sectional study was conducted from Jan 2012 to Sept 2013 involving a total of 2000 parents with the help of a proforma containing predesigned questionnaire. Demographic data of parents, obstetric details of mother, birth weight of baby, details on antenatal advice about breast feeding practices, other details like prelacteals, duration of exclusive breast feeding, awareness on bottle feeding and reasons for non exclusive breast feeding were noted. The data collected was tabulated and statistically analysed.

Results: Out of 2000 children taken up for study, 1133 (56.65%) were exclusively breast fed. The prevalence of predominant and partial breast feeding was 11% (220/2000) and 29.8% (596/2000) respectively. 51 children were not breast fed. Factors promoting EBF with statistical significance were parity of the mother, antenatal advice, mode of delivery, birth weight, breast feeding initiation time and prelacteals.

Conclusions: EBF rates were higher in multiparous women, mothers aged >20 yr, babies in whom prelacteals were not given and breast feeding was initiated within 1 hour of life.

Keywords: exclusive breast feeding, prevalence, prelacteals, misconceptions

INTRODUCTION

EBF for 1st 6 months is the most appropriate infant feeding practice and its benefits are well established.¹ WHO recommends exclusive breast feeding for 1st 6 months of life and continued breast feeding upto 2 yr of age or beyond. This is the most cost effective intervention to reduce infant mortality in developing countries. With optimal breast feeding practices, children are less prone to diseases such as diarrhea, pneumonia and otitis media in addition to significant benefit on brain development and long term protection against childhood obesity, diabetes and cardiovascular diseases.² Realising the high prevalence of inappropriate child feeding practices and the importance of exclusive breast feeding, the Govt of India included specific goals in the 10th five year plan to improve infant feeding practices in order to reduce infant mortality rate (IMR) and malnutrition and promote integrated early child development. Its aim is to increase the initiation of breast feeding within 1 hr of birth to 50% from the current level of 15.8% and to increase the exclusive breast feeding rate in the 1st 6months to 80% from the current level of around 46%.²

Though there have been global movements towards protecting, promoting and supporting breast milk as a part of optimal feeding practice among newborn babies, there exists many discrepancies between what has been recommended and what is being practiced in reality.³ There are number of factors like undesirable socio-cultural beliefs, poor knowledge of exclusive breast feeding and many other variables which are intrinsically related to breast feeding practices of the mother.⁴ This fact justifies the need for a regional study that could suggest necessary interventional steps based on knowledge of local realities. The present study was undertaken with this objective to know prevalence of EBF and to study various factors responsible for failure of EBF for the first 6 months and to study average duration of EBF in this region.

MATERIAL AND METHODS

This study was a cross sectional hospital based study conducted in the Department of Pediatrics in Govt. General Hospital, Rangaraya Medical College, Kakinada from Jan 2012 to Sept 2013. Sample size was 2000. Parents attending with their children in the age group of 1-2 year were interviewed in the local language with the help of a proforma containing predesigned questionnaire. Written informed consent was taken from all the parents who participated in the study and institutional ethics committee approval was obtained before undertaking the study. Data regarding demography, educational status of mother and father, parity, mode of delivery and birth weight were recorded. Details of antenatal advice on breast feeding, breast feeding initiation time, prelacteals, duration of EBF, awareness on bottle feeding and reasons for non exclusive breast feeding were noted.

STATISTICAL ANALYSIS

Data was presented as mean and standard deviation (SD) using IBM SPSS version 20. To compare the significance of association between breast feeding practices and the variable, Chi-square test was employed and p value <0.05 was considered statistically significant.

RESULTS

In the present study average duration of EBF was 5.07months. Out of 2000 children taken up for study, 1133 (56.65%) were

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exclusively breast fed. There was no statistically significant difference in the prevalence of breast feeding among males and females. The prevalence of predominant and partial breastfeeding was 11% (220/2000) and 29.8% (596/2000) respectively. 51 children were not breast fed (Table-1).

Prevalence of EBF was higher in mothers of ≥ 20 yr of age (57.4%) than in mothers of <20 yr of age which was statistically significant with a p value of <0.05 . The proportion of rural mothers practicing EBF was 57.7% (869) while proportion of urban mothers practicing EBF was 53.3% (264). The association between residence and EBF was found to be statistically insignificant with p value of >0.05 . 57% and 56.7% of Hindu and Christian children were exclusively breast fed whereas only 30% of Muslim children were exclusively breastfed. The association between religion and EBF was statistically insignificant. 59.6% of illiterate mothers and 55.4% of literate mothers exclusively breastfed their children for >6 mo. The association between maternal education and EBF was statistically insignificant with a p value of >0.05 .

Factors promoting EBF which were statistically significant include parity of the mother, antenatal advice, mode of delivery, birth weight, breast feeding initiation time and prelacteals. The various factors assessed for their effect on EBF shown in Table-2.

Reasons for failure of exclusive BF for first 6 months were given in table-3. Maternal misconceptions (308 ie 35.52%), was the commonest reason for non EBF followed by local practitioners advice ((242 ie 27.9 %) and others advice (107 ie 12.34%). Baby factors like feeding difficulties, prematurity etc account for only 8%. Out of 2000 parents, only 34.5% (690) were aware of the risks of bottle feeding.

DISCUSSION

The overall prevalence of EBF in our study was 56.6%. This is closely correlating with the results of Rajesh et al,^{5,6} whereas the prevalence of EBF according to NFHS-3 was 46%.⁷ This shows a relatively better breast feeding practices in our area. In the present study, there is no statistically significant difference between the prevalence of EBF in male and female children (52.33% and 47.60%). Similar results were reported in the study done by Ukegbu et al⁸ (35.7% and 38.9%) whereas EBF was more prevalent among male children in the study done by Rajesh et al. In the present study, EBF is practiced mostly by mothers of ≥ 20 yr of age (57.4%) which was also reported by Ukegbu et al. But in the study by Rajesh et al, EBF was more prevalent among mothers of <20 yr of age (87%).

EBF is also found to be more prevalent among illiterate mothers in the present study which correlates with the study by Rajesh

Status	Number	%	Male	%	Female	%	Total
Exclusive BF	1133	6.65%	593	55%	540	58.5%	1133
Predominant BF	220	11%	146	13.5%	74	8.02%	220
Partial BF	596	29.8%	318	29.5%	278	30.1%	596
No BF	51	2.55%	21	1.95%	30	3.25%	51

Table-1: Prevalence of exclusive, partial, predominant and no breast feeding

Factor	EBF	%	Non EBF	%	Total	p value
MATERNAL AGE						
≥ 20 yr	1055	57.4	783	42.6	1838	<0.05
<20 yr	78	48.1	84	51.9	162	
Urban	264	53.3	231	46.7	495	>0.05
Rural	869	57.7	636	42.3	1505	
Hindu	865	57	653	43	1518	>0.05
Muslim	6	30	14	70	20	.
Christian	262	56.7	200	43.5	462	
Literate	780	55.4	628	44.6	1408	>0.05
Illiterate	356	59.6	241	40.4	597	
Primigravida	219	49.8	221	50.2	440	<0.01
Multigravida	917	58.8	643	41.2	1560	
Antenatal advice						
Given	976	59	677	41	1653	
Not given	162	46.7	185	53.3	347	<0.01
Normal delivery	952	59	662	41	1614	
LSCS	185	48	201	52	386	<0.01
Weight of baby						
Normal	823	55.2	667	44.8	1490	<0.05
LBW	314	61.6	196	38.4	510	
BF initiation time						
<1 hr	505	63.1	295	36.9	800	
1-6 hr	372	60	249	40	621	<0.01
>6 hr	256	48.5	272	51.5	528	
Prelacteals Given	287	47	323	53	610	<0.01
Not given	844	63	495	57	1339	

Table-2: Various factors affecting EBF rate

Factors	Number	Percent (%)
Feeding difficulties	50	5.77
Prematurity	12	1.39
Surgery	19	2.2
Misconceptions	308	35.52
Maternal illness	54	9.7
Maternal stress	16	1.85
Maternal psychosis	2	0.23
Breast problems	17	1.96
Working mother	2	0.23
Local practitioner advice	242	27.9
Advice by others	107	12.34
Adoption	7	0.80
Temp separation from mother	4	0.46
Not known	7	0.80

Table-3: Reasons for Non EBF for first 6 months

et al. The proportion of multiparous women practicing EBF is greater than in primiparous women which correlates with the study by Ukegbu et al. This could be due to better awareness and confidence to breast feed in multiparous women. In the present study, mothers who received antenatal advice practiced EBF more commonly which is also shown in the study by Rajesh et al. In the present study, more number of babies delivered by normal vaginal delivery were exclusively breast fed which was also reported by Rajesh et al. This is probably due to delay in initiation of breast feeding following caesarean section. EBF is more prevalent in LBW babies, probably due to continuous monitoring and emphasis on breast feeding of LBW babies by health care personnel. In the present study, EBF is more prevalent in babies who were initiated feed within 1 hr of birth (63.1%) than in babies in whom breast feeding initiation was delayed. This correlates with the study by Rajesh et al.

The main reasons for failure of EBF in our study misconceptions (35.52%) which is similar to the study done by Nayak et al⁹ followed by other factors like lack of knowledge that EBF should be continued for first 6 mo, improper advice (27.9%) by local practitioners and other family members (12.34%). Majority of the mothers (65%) were not aware of the risks of bottle feeding. The average duration of EBF in this study was 5.07 months. Most of the mothers were under the impression that breast feeding alone is not sufficient after 4 mo and complementary feeds should be introduced at 4-6 mo age for proper growth of the infant.

The prevalence of EBF in the present study is higher than the national level indicating better feeding practices in our area. However there is a scope for improvement in EBF rate as a large proportion of infants are not exclusively breastfed during the first 6 months despite what is recommended in the national and global infant and young child feeding (IYCF) guidelines probably due to failure of mass education programmes on nutrition guidelines to reach people residing in all parts of the country with a special focus on lactating mothers. Hence, ongoing multi-sectoral approach at national level with periodic reinforcement in certain areas is required to bring about social and behavioural changes regarding optimal infant feeding practices at health centres and community level in order to reach the goal of EBF as the most appropriate infant feeding practice. Some of the measures to promote EBF by breast feeding

propagation programmes is to identify, counsel and provide extra support to at risk mothers who are found to be more likely to discontinue EBF early like primiparous and caesarean section mothers. Education programmes on breast feeding should be taken up in all antenatal, postnatal and immunisation clinics. Contraindications for BF are very and all health care personnel should be well versed with the contraindications to BF and advise mothers to continue BF even while on medications for diseases like tuberculosis or suffering from minor illness like fever. Awareness regarding correct breast feeding practices like EBF for first 6 mo, early initiation of breast feeding within 1 hr after birth, avoidance of prelacteals and knowledge about adequacy of breast milk to lactating mothers, has to be reinforced during each visit to health centre or during the house visit by health workers. Lactation failure is a major problem in mothers when baby is sick or LBW and admitted for prolonged period in NICU. Majority of these babies tend to be on formula feeds after discharge from health facility. Special effort to sustain lactation by counselling these mothers to initiate frequent expression of breast milk soon after admitting the baby prevents lactation failure thereby improving the EBF rate among these babies once they recover and able to take direct breast feeding. Mass media communications like radio, TV and posters can be used to increase awareness regarding EBF and to remove misconceptions in the general public.

Limitations: As this is a hospital based study, it does not represent the true situation in the community. Most of the children included in the study were sick and often come from poor socio economic status. Since study group was children between 1-2 yr, there could be a chance of recall bias by parents as they had to recall from their memory and answer the questions.

CONCLUSION

In spite of the well-recognized importance of EBF, the practice is not widespread in the developing world. EBF rates in our study were higher in multiparous women, mothers aged >20 yr, babies in whom prelacteals were not given and breast feeding initiation done within 1 hr of life. Though the prevalence of EBF in the present study is higher than the national level indicating better feeding practices in our area, it is far behind the national target of 80% set by Govt of India implying the fact that promotion of IYCF programmes nationwide continue to require investments and commitment in order to have maximum impact on children's lives.

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Effectiveness of Supplementing Didactic Lectures in Cardiovascular Physiology with Intermittent Sessions of Discussions in Improving Academic Performance

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ABSTRACT

Introduction: Medical undergraduate students condemn Human Physiology as 'hard'. Routine didactic lectures are insufficient for adequate learning outcomes in all students with varying preferences for methods and durations of learning. This study evaluates the effectiveness of supplementing didactic lectures in improving academic performance of students.

Material and Methods: In this educational intervention study the routine lectures in CardioVascular Physiology were supplemented with intermittent sessions of discussions for willing students of first year medical (n=77) and Bachelor Cardio Vascular Technology course (n=10) students. Case histories, diagrams, videos and / graphs were used for discussing 6 topics. Assessment of effectiveness was done by 10 Multiple Choice Questions given as Pretest and Posttest for each of 6 discussion sessions. An interview was conducted for same topics, with slightly different questions, to assess deeper understanding for those who attended all sessions (n=41). Stress levels were assessed using Perceived Stress Questionnaire PSQ and scored by adding responses of 30 items on Likert scale. Statistical analysis was done using SPSS 16.

Results: There is a statistically significant improvement in mean percentage scores of Posttest (76.73%, 75.8%) compared to Pretest (44.03%, 51.5%) scores of medical and BCVT students ($P < 0.001$ by paired t test). Stress scores were low for majority and coping measures seemed adequate. Association of post test performance with having a relative in medical field was significant for medical undergraduates (Fischer's test 0.048).

Conclusion: Supplementation of didactic lectures with short, interactive, discussion sessions improves academic performance. Better understanding of Physiology will facilitate grooming of better future clinicians. Medical undergraduates have some stress but not significant to affect their academic performance.

Key words: didactic lectures, questionnaire, discussion, active learning, stress scores, stress relievers.

In this era of technological advancements it is important to incorporate different teaching methods to rein in the interest of students. So the need to combine passive pedagogical and active andragogical approaches to teaching.² Interactive small group discussions encourages students to ask questions, improves understanding and communication skills.³ A sound language knowledge is important as textbooks are in English.² Also a sex-based difference in learning and listening styles is known, with females preferring live lectures to recorded materials.^{4,5}

There is no one best way to teach everything to all students. Routine didactic lectures may be insufficient for adequate learning outcomes for all as they differ in their preferred method and duration of learning.

Different methods have been tried previously-For disorders of Gastro Intestinal Tract and Endocrine System, students learnt better with oral presentations and "patient-doctor" role play.⁶ For endocrinology Method of Loci (MOL) a mnemonic device to arrange and recollect memorial content facilitated learning.⁷ Problem-based learning (PBL) is beneficial to study in depth, find answers to problem situations, have better clinical knowledge and reasoning but coverage of topics was less.^{8,9} So the preference for Case-based learning CBL a structured, guided inquiry.¹⁰ Blended Web Based Learning WBL-PBL course with immediate automated marking and feedback improves student performance in same teaching time.^{11,12} Interactive Computer-Aided Learning (CAL) via online sites with Face-to-face teaching overcomes time/place constraints of a classroom.¹³⁻¹⁶ A horizontally and vertically integrated curriculum provides required knowledge, attitude and skills.^{17,18} Even separation of theory and practicals with clearly defined and different learning objectives, leads to better problem-solving skills and understanding.¹⁹

This study attempts to find the effectiveness of supplementing didactic lectures in sustaining interest of students, facilitating learning thus leading to improved academic performance. Also to find from students itself why they find Physiology *difficult*.

INTRODUCTION

Of the basic science subjects in first year of medical undergraduate course, students somehow find Physiology "hard" to learn.¹ The paramedical course students have similar opinion. This may be due to, the nature of the discipline and the prior knowledge of student accumulated over schooling years.¹ Immediate changeover from school routine with pedagogical teaching to a hectic professional course, leads to problems in finding individual appropriate methods of coping with daily learning; both theory and practical. Deadlines of exams leads to more memorization and less understanding of concepts. In didactic (routine) lectures, the predominant method of teaching, students are passive. Lack of routine student feedback process leads to a wait till examinations to assess learning.

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MATERIAL AND METHODS

This pilot study evaluates the effectiveness of supplementing the routine lectures to facilitate learning taking only CardioVascular System for discussion.

Prior clearance was obtained from Institutional Research Committee IRC (No: B3/1573(A)/2010/ TDMCA dated 06/11/2013) and Institutional Ethics Committee IEC (EC 68/2013, No:B3/1573/2010 /TDMCA dated 28/11/2013) of Govt.T.D.Medical College, Alappuzha, Kerala. Funding of Rs. 39723 was granted by State Board of Medical Research SBMR unit, Govt.T.D.Medical College, Alappuzha, Kerala (order no:A1/4442/2013 G.T.D.M.C.A dtd 9.12.2013 and 26.3.2014). This educational intervention study was open to the entire batch of students (MBBS-150 and BCVT-5) as recommended by IRC but was targeted for those requiring academic improvement. As expected the following students who gave a written consent were included- first year medical undergraduates (MBBS students) of 2013 who scored below 50% in first exam (n=72) and supplementary batch students of 2012 (n=5) and Bachelor Cardio Vascular Technology (BCVT) students 2013 (n=5) and 2014 (n=5).

Following questionnaires were used to collect information from students.

General information questionnaire, Perceived Stress Questionnaire PSQ (for Stress evaluation), Evaluation questionnaires - Multiple Choice Questions MCQs for 6 selected topics; 1-Cardiac muscle and Conducting system of heart, 2-EKG, 3-Cardiac cycle, 4- Cardiac output, 5-Hemodynamics and functional anatomy of vasculature and 6-Blood pressure.

Each 1hour session started with 10 MCQs given as Pretest, followed by a discussion for the topic with help of few projected diagrams, graphs, videos and/ case based discussions(35min). Same set of 10 questions was then given as Post test. Both were scored out of 10 marks. Though 77(72 regular +5) MBBS and 10 BCVT students came for initial sessions only 41 MBBS students attended all the sessions and they were individually called later for Interview session. Slightly different questions were asked to assess deeper understanding; took minimum of 40 min for each student.

As study was done in the college Lecture hall after the routine lectures, light refreshment was provided from the project funding. Few students gradually dropped out, citing different reasons -other tests and seminars in between, tiring after routine schedule and other personal inconveniences.

STATISTICAL ANALYSIS

Data collected were analysed and interpreted using SPSS 16. Paired *t* test was used to find significant difference between mean percentage scores of pretest and post test. To find association between mean percentage post test score and categorical variables (various factors like stress scores, tuition dependence, syllabus studied in school etc) Chi square and Fischer's test was used.

RESULTS

General information questionnaire

Majority of medical undergraduates (MBBS) and BCVT students had studied under Kerala State syllabus, had academic support in form of tuitions in Xth and XIIth classes(Table-1).

Majority of MBBS students scored above 90% in Xth and XIIth. Majority faced the struggle of expected adjustment problems, self management of daily chores and time management as 85.7% MBBS and 100% BCVT students were staying in Hostel.

Premedical entrance - Coaching was specifically taken by 94.8%, exam was cleared in first attempt by 16.9%, in more than 1 attempt by 83.1%, decision of course selection was taken because of Own and/or Parent's interest by 85.7% of MBBS students. While all BCVT students got selection in the first attempt based on XIIth marks and selection of course was because of own interest for majority.

Ambition of 71.4% MBBS students was to become a good doctor, serve society etc and the rest aimed for Post Graduation, better lifestyle etc. Comparison of first mentioned response shows that majority- aspired to become a good doctor 59.7%, do postgraduation/super speciality 40.3%; thus all were motivated and interested in course. Majority of BCVT students wanted to become good technicians and get good jobs.

Among parents of MBBS students - 48% fathers and 50.6% mothers were- graduates, postgraduates or professionals and majority mothers, irrespective of level of education were housewives (only 25 were employed). Education of parents does influence the interest, awareness and motivation of student regarding a professional course.

Of MBBS students 23.4% had relatives in medical field who could guide them on different aspects of a professional course.

Among parents of BCVT students -5 fathers and 4 mothers were graduates, postgraduates or professionals. All mothers were housewives. Only 2 students had relatives in the medical field.

For evaluation of presence of stress, Perceived Stress Questionnaire PSQ²⁰ was administered around time of first sessional examination. It was based on subjective perception, emotional, cognitional response of person to a validated list of 30 item questionnaire. Each item/query had to be graded from 1 to 4 on a Likert scale. Items were divided into four factors indicating scales; Factor I – worries (stress reaction), II- tension (perceived stressor), III- joy and IV- demands.

An overall score was calculated from sum of score of all factors with score of the scale "joy" being inversed as it is positively coded. Higher scores indicate more stress.

Scores obtained were divided into the following ranges; 41-50 as Very low, 51-60 as Low, 61-70 as Medium, 71-80 as High, 81-90 as Very High and 91-99 as Extreme Stress.

Majority of students had medium to high stress 46.7% of MBBS and 70% of BCVT. To check for association of stress with academic performance, scores of 41-70 were taken as Low stress and 71-99 as High stress. 70% of BCVT students had Low stress. Similarly majority of MBBS students 61% had Low

	MBBS (n=77)	BCVT(n=10)
State syllabus in X th	58.4%	90%
State syllabus in XII th	58.4%	100%
Above 90% score in X th	74%	30%
Above 90% score in XII th	67.5%	50%
Support of tuitions in X th	54.5%	50%
Support of tuitions in XII th	64.9%	70%

Table-1: Percentage of MBBS and BCVT students who studied in state syllabus, scored above 90% and took academic support of tuitions in class Xth and XIIth. All are academically good.

stress but exam related stress was mentioned by majority. Taking first mentioned response as major source of stress it was seen-for MBBS students (n= 77) this was Exam related (41) and Inability to cover portions (14) and for BCVT students diversely due to Inability to cover portions, feeling homesick, adjustment problems, radiation exposure concerns in Cathlab etc. Grouping reasons like Inability to cover portions, Exams related, difficulty in Anatomy, Physiology, high expectations all together as Exam stress; this was mentioned by 85.7% of MBBS and 30% BCVT students.

Stress incident reporting: There were no specific stress causing incident / incidents reported.

Stress was *relieved* mainly by Talking to parent/ friend or by listening to music in 59.7% MBBS and 80% BCVT students.

Evaluation questionnaire: The scores of each student out of 60 was converted to % and values obtained for Pretest and Posttest. Mean % scores were 44.03 and 76.73 for MBBS (n=77) (Table-2) and 51.50 and 75.80 for BCVT (n=10) (Table-3). Comparison by Paired t test using 95% Confidence Intervals shows a highly significant improvement from Pretest to Post test % scores $P < 0.001$ for both groups. In Interview group (n=41) Pretest, Posttest and Interview mean % scores were 46.41%, 78.71% and 47.56% respectively (Table-5). Statistically significant improvement is seen in post test but not in interview scores. Possibly immediate recall is good but long term retention and in-depth learning is not satisfactory.

Taking above 65% scores as high and below 65 % as low, association of Post test performance was compared with various factors like stress scores, tuition dependence, syllabus studied in school etc, using Chi square or Fischer's test. Significant association was seen only with having a relative in medical field for MBBS group (Fischer's test 0.048).

An informal verbal feedback taken from Interview group (n=41) showed majority took down class notes regularly 65.8%, sometimes by 31.7% and not done by 2.4%. Self notes were not made by 48.7% (because of lack of time and inability to cover portions), sometimes made by 24.3%, only near exam time by 14.6% and regularly made by 12.1%. Habit of reading text was present in 36.5%, text and notes in 41.5% and only near exam time by 14.6%.

Unfortunately majority studied only on verge of exams and mostly from thinner guide type books for rapid coverage of topics. Up-to-date coverage of daily portions taken in lectures was not possible for majority 97.6%. Self study was preferred by majority of students 58.5%, combined study by 19.5%. Only for exams, combined study was done by 4.87%, both self and combined study by 17%. As expected self study seems the most preferred method.

If a topic was not understood, majority just memorized it 39%, some tried reading again 34.1%, 7.3% each; either asked others

or left the topic.

The most difficult topics in CVS for majority were cardiovascular reflexes, BP and shock (31.7%), followed by ECG (24.3%) and then cardiac cycle (21.9%).

The most difficult subject for majority was Physiology 51.2%, followed by Anatomy 34.1% and Biochemistry 12.19%.

All mentioned that initially they had difficulty in managing time. Anatomy being given more time by majority, uncovered portions of other two subjects piled up and could not be covered the week prior to exam when they seriously started reading. There was no definite time plan to cover all portions daily. This lead to dependence on guide like books having question with answer discussed format. With less understanding it was difficult for students to sequentially put together concepts, leading to low academic scores. Unfortunately this lead to lack of confidence, disinterest in the subject and condemnation of Physiology as *difficult*. Few students were unable to find their personal, effective and time efficient method to study.

Feedback regarding study: The study was rated as Useful by majority of students. Only 2 responses for '*All reasons for study not being useful*' - show that it was necessary for a student to put his/her effort and have read the portion prior if the discussion was to be a useful supplement.

Majority wanted - small groups for such discussion (< 20) citing better interaction, other systems to be included and extension of such discussions for coming fresh batches of students.

An informal verbal Feedback of entire MBBS batch showed that for majority of first MBBS students the most difficult subject was Physiology (Table-5) and the most difficult system was Nervous system (CNS) (Table-6).

DISCUSSION

Physiology the foundation for future better clinicians, requires integrating knowledge from different disciplines (physics, chemistry, biology) and many levels of organization (molecular,

MBBS	Mean	S.D	SEM	P value
Pre test%	44.03	11.373	1.296	< 0.001
Post test%	76.73	10.351	1.180	

Table-2: Mean % score, standard deviation and standard error of mean of MBBS (n=77) students in pretest and posttest. Post test performance following discussion shows significant improvement by paired t test with $P < 0.001$.

BCVT	Mean	SD	SEM	P value
Pre test%	51.50	15.911	5.032	< 0.001
Post test%	75.80	11.830	3.741	

Table-3: Mean % score, standard deviation and standard error of mean of BCVT(n=10) students in pretest and posttest. Post test performance following discussion shows significant improvement by paired t test with $P < 0.001$.

Interview n=41	Mean	S.D	SEM	Paired t test	P value
Pretest %	46.41	10.759	1.680	Pre -Posttest	< 0.001
Post test %	78.71	8.116	1.267	Pre -Interview	0.558
Interview %	47.56	14.018	2.189	Post- Interview	< 0.001

Table-4: Mean % score in pretest, posttest and interview of the Interview group (n=41) MBBS students who attended all 6 sessions of discussions, with standard deviation and standard error of mean. Last column shows P values obtained by paired t test for Pretest-Posttest, Pretest-Interview and Posttest-Interview. Highly significant improvement is seen in post test performance.

Most difficult subject	Frequency	Percentage
Anatomy	55	38.5
Physiology	71	49.6
Biochemistry	17	11.8

Table-5: Most difficult subject for first MBBS students (n=143), from an informal verbal feedback, taken after their Physiology University practical viva voce examination.

Most difficult system	Frequency	Percentage
CNS	95	67.8
Endocrine	14	10
CVS	11	7.8
Respiration	10	7.14
Gastrointestinal	7	5
Renal	2	1.4
Special sense	1	0.7

Table-6: Most difficult system in Physiology for first MBBS students (n=143), from an informal verbal feedback, taken after their Physiology University practical viva voce examination.

cellular, organ, organism).^{21,22}

Teacher-centered lectures provide a base of organized knowledge, which student should integrate for more active learning.² There cannot be a sudden complete shift from the prescribed lectures but supplementation via interactive sessions can bring conceptual and academic improvement in students by facilitating active learning. This is not a novel concept.

As no single method of teaching can ensure thorough understanding, blended learning is need of the hour to rethink the design and delivery of teaching.¹¹ In the struggle to meet deadlines, gaps in concepts are easier to fill if there is guidance for example from a relative in medical field or maybe discussions disguised in name of tutorial.

Examples of innovative teaching methods are physioquiz, computer-assisted learning, undergraduate projects, seminars, concept mapping by mental models and making models using play dough for ever confusing nervous tracts.²³

Computerized simulation sustains interest, makes understanding easy,²⁴ especially in surgical procedures²⁵ though effectiveness in medical education has been questioned. Only active learning leads to lasting meaningful learning.^{26,27} Even articulating explanations to self/peers or discussing doubts with teachers helps. Peertutored discussions are more preferred being interactive and interesting.²⁸ A problem-based integrated curriculum for CVS had previously showed benefit.²⁷

Even in this study supplementary discussions with diagrams/videos/case histories have shown significant immediate improvement in academically interested students as seen in post test scores. But expected improvement in Interview scores is not seen; adequate depth in learning has not been achieved. Possibly smaller groups are required for more interaction. Also time required for a student to assimilate concepts varies and there is no substitute to their spending time with difficult topics, consistent hard work and effective time management.

In the routine schedule itself time can be allotted for refreshing diagrams/ tables discussing cases histories or situations. Student can thus become prepared to interpret different novel case settings.

Academic improvement, in learning and understanding of

Cardiovascular system Physiology is seen with supplementary discussions. But motivation and interest of the student is required to spend time, find cause-reason relations and integrate understanding of physiological mechanisms. Medical undergraduate students face some stress and failure of coping strategies can lead to a spectrum of depressive symptoms.²⁹ Monitoring and appropriate support system is required for those few unable to cope with stress.³⁰ Stress amongst medical students, in this study is low for majority and does not have a significant effect on post test performance.

Since the association of post test performance of students was significant only for having a relative in medical field, it shows the importance of guidance in different aspects of medical profession. Teacher can guide the student to the correct route (facilitate learning) but student has to find his/her own way (active learning). It is but hard to distinguish between the independent and dependent variables in Educational research.

This study can be extended to other systems, with more interactive smaller groups.

CONCLUSION

All medical undergraduates are academically good. Majority have some stress but not significant to affect academic performance; coping measures seemed adequate. Exam related stress can be handled better possibly with better time management, daily coverage of topics and guidance; be it from a relative in medical field or from teacher. There is no alternative to student's own effort, interest, motivation and individualized method to learn. Further studies with smaller groups for better interaction, has to be done to make Human Physiology *easy* for students.

Statistically significant academic improvement is seen by supplementing the routine didactic lectures with short sessions of discussions. Such interactive, sessions will help to fill lacunae in understanding of Physiology, making it interesting, easy and thus facilitate the grooming of better future clinicians.

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Role of Seton in the Management of Fistula-in-ANO

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ABSTRACT

Introduction: A seton is a foreign body which is passed through the fistula and tied at its exit to the skin. The classical treatment for perianal fistulas is to either fistulotomy or fistulectomy. Aim of the research was to study the role of seton in the management of fistula- in -ano. To find out what necessitates the use of seton in fistula-in-ano

Material and Methods: This study is a prospective study conducted at Kerudi hospital and research centre Bagalkot, Karnataka. The present study has undergone descriptive and inferential statistical analysis. Chi-square/ Fisher Exact test has been used to find the significance of study parameters on categorical scale.

Results: At the end of 1 month, 63.6% of the patients who underwent fistulotomy had their wounds healed while in seton group 46.7% of the wounds healed and in fistulectomy group 57.1% of the wounds had healed and the values were not found to be statistically significant ($p=0.592$).

Conclusions: This study has shown that seton is an effective tool for the treatment of complex anal fistulas. The median follow-up period is more than 1 year, and the success rate appears to be high. Overall quality of life is improved in all the patients in whom seton was placed, with not much of post operative complications-pain or pruritus. Patients were satisfied with the treatment offered.

Keywords: fistula- in -ano, seton, fistulotomy, fistulectomy.

INTRODUCTION

Fistula-in-ano is one of the commonly encountered surgical problems with prevalence of 1.2 to 2.8/10000.¹ It is characterized by severe pain and discharge. They arise following infection near the anal canal, or secondary to specific conditions of the intestines like Crohn's disease, tuberculosis. By meaning 'cryptoglandular abscess' means abscess arising from the anal glands. Because of the close association of abscess and fistula in aetiology, anatomy, pathophysiology, therapy and morbidity, it is appropriate to consider both entities as one, i.e., abscess-fistula or a fistulous abscess. It is also appropriate to consider an abscess as the acute and a fistula as the chronic state of anorectal suppuration.

The classification of fistula-in-ano, as described by Parks et al. is based on the location of its tract in relation to anal sphincter muscle: intersphincteric, transsphincteric, suprasphincteric, or extrasphincteric.² The term complex fistula is modification of the Park's classification, which falls in any one of these conditions, that is, the tract crosses >30% to 50% of the external sphincter, anterior tracts in females, multiple tracts, recurrent, or the patient has pre-existing incontinence, local irradiation, or Crohn's Disease. Due to the involvement of the anal sphincter, the treatment of complex fistula poses a high risk for impairment of continence.^{3,4}

The treatment of perianal fistulas is diverse because no single technique is universally effective. Surgery is the mainstay of treatment of anal fistulas. The principles of anal fistula surgery

are to eliminate the fistula, prevent recurrence and preserve sphincter function.⁵

Fistulotomy can treat simple and low anal fistulas safely, but in case of complex fistulas management needs to be balanced between the outcome of cure of fistula and anal continence. During fistulotomy there is a risk of sphincter muscle damage, and this might lead to varying degrees of an unacceptable risk of anal incontinence (AI).⁶⁻⁸ The amount of damaged muscle, pre-existing sphincter damage, and scarring of the anal canal are the main dependent factors which decide the degree of anal incontinence. Several alternative treatment strategies have been practiced in order to preserve the sphincter mechanism, including draining setons, cutting setons,⁸⁻¹¹ rectal mucosal or full-thickness advancement flaps,¹²⁻¹⁴ rerouting,¹⁵ two-stage seton fistulotomy,¹⁶ fistulectomy, anal fistula plug,¹⁷⁻¹⁹ ligation of the intersphincteric fistula tract (LIFT),^{20,21} fistulotomy with reconstruction of the sphincter mechanism,²² or fibrin glue.²³ Recently, Video-assisted Anal Fistula Treatment (VAAFT) have been introduced, which is a minimally invasive and sphincter saving technique for treating complex fistulas.²⁴ The studies related to this, are still preliminary and need longer follow-up for validation.

In our study, we used cutting seton and evaluated our experience in managing fistulas. Aim of the study was to know the role of seton in the management of fistula- in -ano. Objectives included in the study were to find out what necessitates the use of seton in a patient having fistula-in-ano by pre-operative assessment with endoanal ultrasound and intra-operative findings, to calculate the frequency of putting seton in patients of fistula- in -ano by comparing with patients in which seton is not placed, to evaluate the effectiveness of fistula healing when seton is placed by periodic follow up and to calculate the recurrence rate and incontinence rate associated with seton use.

MATERIAL AND METHODS

This study is a prospective study conducted at Kerudi hospital and research centre Bagalkot, Karnataka from May 2012 to October 2013, after getting approval from the hospital research and ethics committee. Informed consent taken for all the patients.

Material

Sixty- six patients with complaints, clinical signs suggestive of

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primary fistula- in-ano between the age group of 20 years and 80 years were included in the study.

Inclusion Criteria

- All patients (males and females) in the age group 20-80 years, who present with primary fistula-in-ano.

Exclusion Criteria

- Fistula secondary to 1) Crohn's Disease
2) Tuberculosis
3) Malignancy
- Recurrent Fistula at presentation.
- Not willing to participate in the study
- Pregnant females.
- Immuno-compromised patients.

Study Design: A prospective observational study between May 2012 and October 2013, consisting of sixty-six consecutive patients fulfilling the above mentioned selection criteria were treated with appropriate fistula surgery, depending on the type of fistula.

Fifteen (22.7%) patients were treated with seton, twenty-two (33.3%) patients were treated with Fistulotomy alone, and twenty-eight (42.8%) patients treated with Fistulectomy.

Procedure done	No. of patients (n=66)	%
Fistulotomy alone	22	33.3
Fistulotomy+ seton	15	22.7
Fistulectomy	28	42.4
Others	1	1.5

Table-1: Procedure done

Intra-op findings	No. of patients	%
Simple	40	60.6
Multiple	5	7.6
Complex	21	31.8
Total	66	100.0

Table-2: Intra-op findings of patients studied

Seton fell on its own	No. of patients (n=15)	%
No	10	66.7
Yes	5	33.3
Total	15	100.0

Table-3: Seton fell on its own among the procedure Fistulotomy+ seton

Outcome	Fistulotomy alone (n=22)	Fistulotomy+ seton (n=15)	Fistulectomy (n=28)	P value
Healing at 1 month				0.592
Yes	14(63.6%)	7(46.7%)	16(57.1%)	
No	8(36.4%)	8(53.3%)	12(42.9%)	
Healing at 3 month				0.557
Yes	21(95.5%)	11(73.3%)	25(89.3%)	
No	1(4.5%)	4(26.7%)	3(10.7%)	
Recurrence				0.403
Yes	1(4.5%)	3(20%)	3(10.7%)	
No	21(95.5%)	12(80%)	25(89.3%)	
Incontinence				1.000
Yes	1(4.5%)	0(0%)	1(3.6%)	
No	21(95.5%)	15(100%)	27(96.4%)	

Table-4: Association of outcome according to Procedure done

One patient underwent simple drainage of the intersphincteric collection.

STATISTICAL ANALYSIS

The present study has undergone descriptive and inferential statistical analysis. Continuously measured results are presented on Mean \pm SD (Min-Max) and categorically measured results are presented in Number (%). Consideration of significance is at 5 % level of significance. Chi-square/ Fisher Exact test has been used to find the significance of study parameters on categorical scale between two or more groups.

RESULTS

Forty patients (60.6%) had simple fistula who were treated with either fistulotomy or fistulectomy. Twenty six patients had either a complex fistula or had multiple tracts. Fifteen of these patients were offered seton as the management modality (table-2).

The mean time for the seton to cut through the sphincter and drop was 1 month. In 10 patients(66.7%), the seton did not fall, and patient was readmitted to the hospital for seton removal (table-3). Overall, Complete healing was achieved in 37 cases (56.1 %) at 1 month and in 58 cases (87.9 %) at 3 months.

At the end of 1 month, 63.6% of the patients who underwent fistulotomy had their wounds healed while in seton group, 46.7% of the wounds healed and in fistulectomy group, 57.1% of the wounds had healed and the values were not found to be statistically significant (p= 0.592) (table-4).

At the end of 3 months, 95.5 % of the wound had healed in patients who underwent fistulotomy. Patients who had seton as the treatment modality, 73.3 % of their wounds healed, while with fistulectomy, complete wound healing was seen in 89.3% of the cases.

Two out of 66 patients (3.0%) were observed as having incontinence, one having transient stool incontinence and one had gas incontinence, both had low transphincteric fistula. None of the cases treated with seton had anal incontinence.

DISCUSSION

The ano-perineal abscess/sepsis arising from the glands of the anal crypts leads to Fistula formation. It is has a primary internal orifice in the anal canal, connecting fistulous tract, and an abscess and/or secondary external (perineal) orifice with purulent discharge. Curative treatment is not by anti-biotics but by surgery. The treatment of an abscess is incision and drainage on emergency basis. The primary aim of treatment in perianal

sepsis is to control infection without sacrificing anal continence. Second stage or the definitive treatment of the fistulous tract can wait. Various techniques, such as the fistulotomy, fistulectomy and advancement flap procedure and VAAFT, have been proposed.²⁴ The basis for all treatment options is fistulotomy but the specific technique depends on the height of the fistula in relation to the sphincteric mechanism and anal continence. Overall fistulotomy results are excellent with due risk of anal incontinence. This factor made it inevitable to grow interest in sphincter sparing techniques such as the mucosal advancement flap, the injection of fibrin glue, the plug procedure etc. The results of these procedures are not proved good enough and leave learning space for improvement.

In a study by Pearl RK et al (1993),²⁵ to evaluate the role of seton in 116 patients undergoing treatment of fistula; Setons were employed as part of a staged fistulotomy in 65 patients (56 percent) to identify and promote fibrosis around a complex anorectal fistula. Other indications for seton placement were anteriorly situated high transsphincteric fistulas in 24 women (21 percent) and three patients with massive anorectal sepsis (floating, freestanding anus) (2.5 percent). In addition, setons were used to preclude premature skin closure and promote controlled long-term fistula drainage in 21 patients with severe anorectal Crohn's disease (18 percent) and in three patients with AIDS (2.5 percent).

In our study of 66 patients with fistula in ano, fifteen patients underwent seton placement and rest underwent sphincter cutting procedures, namely- fistulotomy and fistulectomy. Complete healing was seen in 56.1% of the patients at 1 month and 87.9% of the patients at 3 months. In patients who had seton, complete healing was observed in 46.7% at 1 month and 73.3% at 3 months. Another 2 patients had their healing in between 3-6 months.

In this study, there were 7 cases of recurrence with overall recurrence rate of 10.6%. However, only 3 cases of recurrence out of 15 patients was seen in patients in whom seton placement was done i.e. 20% recurrence rate. The persistence (recurrence) rate varied with the type of fistula i.e simple or complex, but there was no statistically significance relation between the type of surgical treatment and recurrence ($P = 0.403$). The difficult target is the complex fistula, that is, those fistulas with any of these characteristics: primary track crossing 30–50 % of the external sphincter (high-transsphincteric, suprasphincteric, and extrasphincteric), anterior track in a female, multiple tracks.

In a study by Eitan, Koliada and Bickel (2009) the recurrence rate of the fistula or suppuration was reported as 19.5% in cases of transsphincteric fistulae.²⁶ Factors associated with recurrence included type and extension of the fistula, lack of identification or lateral location of the internal fistulous opening, previous fistula surgery and the surgeon experience

CONCLUSION

Fistula is more common in the males. Even though only one-fourth of the patients were preceded by an acute abscess, it's in accordance with the literature. This study has shown that seton is an effective tool for the treatment of complex anal fistulas. The median follow-up period is more than 1 year, and the success rate appears to be high. Overall healing period is more in seton group as per our study. Recurrence rate seems to be

more for the seton group but it depends on the technique used and identification of the secondary tracts and internal opening at the time of operation and recurrence rate depends on these factors. The basic purpose of seton to prevent incontinence, it has been shown in our study as well, that seton preserves continence in the patients with overall success in fistula healing. An important practical disadvantage of the conventional seton treatment, namely the need for postoperative adjustments, is also eliminated with cutting seton. Overall quality of life is improved in all the patients in whom seton was placed, with not much of post operative complications- pain or pruritus. Patients were satisfied at the end of the treatment.

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A Retrospective Study on the Incidence of Breast Carcinoma in a Tertiary Care Hospital

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ABSTRACT

Introduction: Breast cancer is the most frequent cancer in women following lung cancer worldwide. The study aimed to look into the estimates of breast cancer patients in the tertiary care hospital.

Material and Methods: A retrospective study for a period of 3 years was under taken. 428 breast lumps presenting to the departments of surgery, radiotherapy and oncology were included in the study.

Results: Out of the 428 breast lumps, 176 cases were fibroadenoma breast, 29 were phylloid tumour, 9 were fibrocystic disease, 2 were duct papilloma, 3 were duct ectasia and 20 were inflammatory. Infiltrating ductal carcinoma with non-specific features was the commonest type, found in 168 patients. Other types include ductal carcinoma insitu 8 cases, 6 cases of infiltrating ductal carcinoma of medullary type. 5 cases were of invasive lobular type and 2 cases were Paget's disease of nipple.

Conclusion: India is experiencing an unprecedented rise in the number of breast cancer and is having a lower mean age at presentation compared to what has been reported in the advanced countries of the world.

Keywords: Breast cancer, breast lump, epidemiology, infiltrating duct cell carcinoma

INTRODUCTION

Cancer is one of the major health concerns worldwide, the year 2012 witnessing 14.1 million new cases and a global mortality of 8.2 million due to the noxious cancer disease.¹ While lung cancer was the most common cancer worldwide contributing to 13% of the total number of new cases diagnosed in 2012 in both the sexes, breast cancer was the most commonly diagnosed cancer in women constituting 25.2% of all new cases.² Cancer is one of the top 10 causes of death in India. In India, breast cancer is the second most common cancer (after cervical cancer) with an estimated 115,251 (22.2% of all new cancer diagnoses) new diagnoses and the second most common cause of cancer-related deaths with 53,592 (17.2% of all cancer deaths) breast cancer deaths in 2008.⁴ Presently 75,000 new cases occur in India every year.⁵ Following the diagnosis in the OPD, workup and staging, and depending upon the stage of the disease, the patient undergoes multimodal treatment, surgery, chemotherapy, radiotherapy and hormonal therapy. This study was aimed to look into the incidence of breast carcinoma among the patients presenting to the surgery department with breast lumps in Andhra Medical College.

MATERIAL AND METHODS

The present study was a retrospective study for a period of 3 year from 01.11.2012 to 30.11.2015. As this study was a retrospective study, no ethical issues or consent from the patient was needed. 428 patients presenting to the surgical department

and diagnosed and/or admitted for evaluation of breast lump were taken into consideration. The cases admitted into the radiotherapy and oncology departments for neo-adjuvant or chemotherapy (Stage III and IV breast cancer cases) were also included. The breast biopsies of these cases were sent to the pathology department, after MRM in case of operable or true-cut biopsies in case of inoperable cases were cross-checked and analyzed.

STATISTICAL ANALYSIS

SPSS version 21 was used for generating tables and graphs. Results are based on descriptive statistics.

RESULTS

A total of 428 breast lumps were diagnosed and treated during this period. 176 cases were of fibroadenoma breast, 29 were reported as phylloid tumour, 9 were of fibrocystic disease, 2 were duct papilloma, and 3 had duct ectasia. 20 cases were of inflammation (19 cases of breast abscess and 1 case of chronic abscess/antibioma). The age of presentation was from 15 years to 81 years.

Out of these 428 breast lumps, 189 cases were of breast cancer. The age of presentation of breast cancers was from 24 years (youngest patient) to 81 years (oldest patient) with a mean of 47.8 years. The most common age group was 40 – 49 years with 58 cases (30.69%), then 50 – 59 years with 49 cases (25.93%), followed by 30 – 39 years with 43 cases (22.76%), 60-69 years with 29 cases (15.35%), 70 – 79 years with 6 cases (3.18%), 20 – 29 years with 3 cases (1.59%) and there was also one case (0.5%) of 81 years.

Infiltrating ductal carcinoma with non-specific features was the commonest type, found in 168 patients (88.89%) out of the total 189 cases. Other types include ductal carcinoma insitu 8 cases (4.23%), 6 cases (3.17%) of infiltrating ductal carcinoma of medullary type. 5 cases (2.65%) were of invasive lobular type and 2 cases (1.06%) were of Paget's disease of nipple.

DISCUSSION

The aim of this retrospective analysis was to study the incidence of breast cancer at a tertiary care hospital. The results of the study showed that in a total of 189 breast cancer patients, the

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common age group was 40 – 49 years with 58 (30.69%) cases, followed by 50 – 59 years with 49 (25.93%) cases and then 30 – 39 years age group with 43 (22.76%) of cases. According to these statistics it can be said that women of the middle age group, third-to-fifth decade (30 – 59 years), 79.38% of cases are at a higher risk of developing breast cancer in the local set-up as also reported in studies from India and other Asian countries.⁵⁻⁷ However, reports from the western world show that the female breast carcinoma is predominantly seen in the fifth and sixth decade. In the present study only 18% of the breast cancer patients are in the fifth and sixth decade.

In our study 46 (24.35%) breast cancer patients were below 40 years of age while Saxena et al. (2005)⁸ had reported 22% and Nigam et al. (2011)⁹ had 31.69%.

Siddiqui M,¹⁰ Siddiqui K,¹¹ Baloch TA,¹³ Aftab ML,¹⁴ and Aslam MN¹⁵ have also found the disease to be commonest in the middle age group (30 – 59 years). Navneet Kaur et al,¹⁶ found maximum (71.3%) cases in the 35 – 54 years age group while Ramchandra Kamath¹² found maximum cases between 50 – 54 years. Balasubramaniam SM¹⁷ found the disease common in 39 – 59 years age group.

In the present study the most common histopathological type found was infiltrating ductal carcinoma. The same histopathological type has also been found commonest by others including Aftab ML,¹⁴ Siddiqui M,¹⁰ Baloch TA,¹³ Batool M,¹⁸ Aslam MN,¹⁵ Qureshi S,¹⁹ and Klonoff-Cohen.²⁰

Majority of the patients were from a rural background which was contradictory to the previous reports from India as well as United States, which show a higher incidence in urban population compared to the rural population.^{21,22} The difference is possibly due to the fact that women in rural areas face

substantial barriers in receiving preventive health care services and poor health awareness.²²

Despite an increasing trend in breast cancer patients, the incidence of breast cancer is lower and the patients are about one decade younger in developing countries than their counterparts in developed nations, yet the cause-specific mortality is significantly higher in developing Asian countries compared with the developed countries in Asia. This is due to

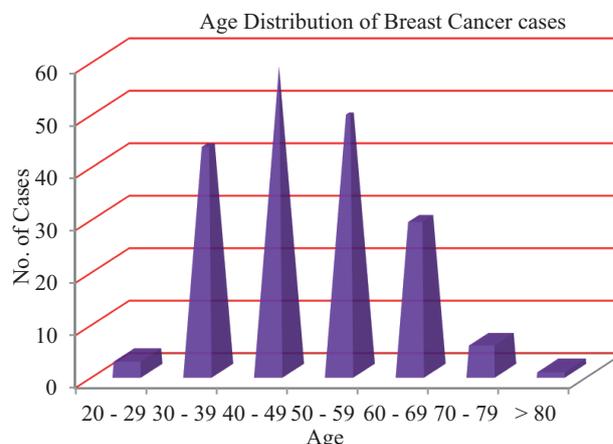


Figure-1: Age distribution of breast cancer cases

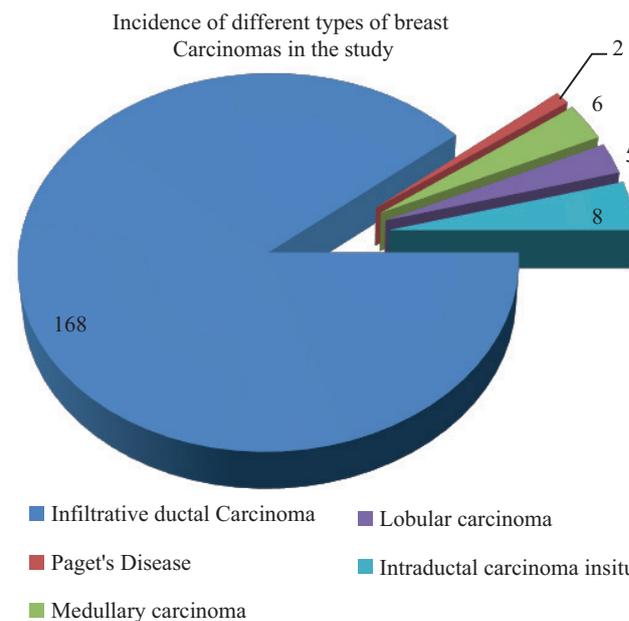


Figure-2: Incidence of different types of breast carcinomas in the study

Total Study Group (N=428)		
Type of case	No.	Percentage
Benign	239	55.84
Fibroadenoma	176	41.06
Phylloid Tumor	29	6.76
Fibrocystic disease	9	2.10
Duct Ectasia	3	0.69
Duct Papilloma	2	0.46
Breast Abscess	19	4.42
Chronic Abscess/Antibioma	1	0.23
Malignant	189	44.16
Breast Carcinoma	189	44.16

Table-1: Distribution of various lesions in the breast

Type	Sub type	Cases	%	
Lobular	In situ	0	0	
	Invasive	5	2.65	
Ductal	In situ	8	4.23	
	Infiltrating	168	88.89	
		Specific		
		Medullary	6	3.17
		Mucinous	0	0
		Tubular	0	0
		Papillary	0	0
		Inflammatory	0	0
Others	Paget's disease of nipple	2	1.06	
	Mixed lobular and ductal	0	0	

Table-2: Distribution of cases of different types of breast carcinoma

the inadequacies of health care infrastructure and standards, sociocultural barriers, economic realities, illiteracy, and the differences in the clinical and pathological attributes of this disease in Asian women compared with the rest of the world together.²³

CONCLUSION

India is experiencing an unprecedented rise in the number of breast cancer and is having a lower mean age at presentation compared to what has been reported in the advanced countries of the world. In order to reduce the burden of the disease multi-sectorial approach and evidence based strategies aiming at early detection and effective management of the disease should be implemented. Public health programs that ensure access to appropriate, affordable diagnostic tests and treatment must be introduced.

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Halo Sign - A Helping Hand to Predict A Thyroid Nodule Possibly Benign

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ABSTRACT

Introduction: Thyroid disease are very common and around 4%-8% of the adult population have a palpable thyroid nodule. Prevalence of Ultrasound detectable thyroid nodules is 19-60%. Thyroid cancer is rare and account less than 1% of all malignant neoplasm. Challenge is to distinguish the few clinically significant malignant nodules from many benign one. Clinically occult nodules can be detected by sonography. High prevalence of thyroid nodule in general population call for clear strategy of management. We had done this study with objectives to study the pattern of ultrasound finding especially the Halo sign in confirmed thyroid nodular swelling and to determine the nature of thyroid swelling using sonography.

Material and Methods: A total of 71 patients with neck swelling were included in the study after permission from institutional review board. They are evaluated with ultrasound and the following characteristics on US images noted special focus was kept on presence or absence of halo and its type - thin or thick; complete or incomplete, also other usg features like nodule size, shape, margin, echogenicity, and presence of calcification noted. Ultrasound diagnosis is correlated with FNAC result and significance of Halo sign and its type was studied.

Results: Out of the 71 patients, 58 were having benign thyroid nodular lesion confirmed on FNAC or biopsy and 13 turned out to be follicular thyroid carcinoma on biopsy. Most of benign thyroid lesion showed complete thin halo around them.

Conclusion: Ultrasonography is repeatable noninvasive imaging modality for investigating thyroid gland. Our experience demonstrates significantly improve specificity for high resolution ultrasound for diagnosis and characterization of benign thyroid lesions. Thin complete halo around thyroid nodule can be taken as strong sign of benignity.

Keywords: Halo Sign, USG thyroid lesions, Thin and Thick Halo, Complete halo

INTRODUCTION

The thyroid gland is unique among endocrine gland in that it is the only one endocrine gland amenable to direct physical examination because of its superficial location. Thyroid lesion is the most common among the entire endocrine gland lesion in India.¹ Thyroid nodules are common and occur in up to 19-60% of the adult population; however, less than 1% of thyroid nodules are malignant. Ultrasonography [US] is the most sensitive method for diagnosing intra thyroid lesions. The challenge is differentiating a few malignant nodules from common benign nodules. Despite the ability of ultrasonography to clearly identify nodules, no single US criterion is reliable in differentiating benign ones from malignant thyroid nodules. Even so, many US features may aid in predicting the benign or malignant nature of a given nodule.²⁻⁶ Typically, Lesions demonstrating a thin echo lucent halo around the entire lesion are most often benign.

Before the advent of high resolution ultrasound capability, radionuclide scintigraphy was the chief means to evaluate the thyroid gland both functionally and morphologically. Along with being much safer and nonionizing, ultrasound is also a much cheaper alternative. C.T. and M.R.I. are also used in the evaluation of thyroid lesion/masses but not as sensitive as ultrasound in detection of intrathyroid lesions and more used for mediastinal extension of thyroid lesion.³ Nearly 50% of patients with a clinically solitary thyroid nodule have avoided surgery by thyroid scanning.⁴

As Thyroid surgeries are complicated by many post-operative complications. So there has been an effort to limit unnecessary surgery in asymptomatic patients with benign lesions.^{5,6} Hence this study was done with aim to study the pattern of ultrasound finding especially the Halo sign in confirmed thyroid nodular swelling and to determine the nature of thyroid swelling using sonography.

MATERIAL AND METHODS

Data for study was collected from all patients (71 patients) of clinically suspected thyroid lesion, referred to the department of Radio diagnosis, Govt. Medical College and Sir Takhatsinghji General Hospital, Bhavnagar. Study was done for a period of 15 months (November 2014 to February 2016) after getting approval from institutional review board.

Patients referred for thyroid ultrasound scan and having nodular lesion were included in the study. Informed consent taken in all patients. We exclude patient having diffuse thyroid lesions. Present study included a total number of 71 cases. Ultrasonography and FNAC was performed following a history and physical examination. Ultrasound and FNAC results were compared.

In our study we use 7.5 to 12 MHz short focus transducer. The patient is examined in the supine position with the neck hyper extended to identify the inferior margin of gland, which may extend to the clavicle in some patients. A pillow is placed under the shoulder to provide better exposure of the neck, particularly in patient with a short, stocky habitus. The thyroid gland is

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scanned in both longitudinal and transverse planes.

Lesion of thyroid gland are divided with nodular thyroid lesion and diffuse thyroid lesion with nodular lesion are studied under size, shape, echogenicity, margin, halo, intralesional vascularity, presence of calcification. Presence or absence of halo, thickness of halo and completeness of halo were noted in all patients. In addition, surrounding structure were studied if any pathology, especially lymphadenopathy.

After the history, physical examination, Ultrasound scanning, thyroid hormonal assay a diagnosis is made. The diagnosis made on ultrasonography was compared with that of histopathological diagnosis.

STATISTICAL ANALYSIS

SPSS version 21 was used to infer results. Results are based on descriptive statistics

RESULTS

71 patients who came in department for ultrasonography of neck were evaluated with high resolution ultrasound for thyroid lesion in this study. Out of 71 patients 58 patients had benign nodular thyroid lesion and 13 patients have a malignant thyroid lesion on Biopsy.

Using complete halo as a predictor for benign thyroid nodule, Statistical Calculations for above table-2 shows high positive predictive value (90.91%) for benign thyroid lesion. This study also reveals good specificity of halo sign 84.62. However Sensitivity is low and is 34.48% and negative predictive value is very low and is 22.45%.

DISCUSSION

Thyroid nodules are extremely common. High resolution sonography is commonly used to evaluate the thyroid gland. Virtually any thyroid disease can manifest itself as one or more nodules. Thyroid surgeries are complicated by post-operative thyroid hormone imbalance, hypoparathyroidism, recurrent laryngeal nerve injury, bleeding or infection; thus, there has been an effort to limit unnecessary surgery in asymptomatic patients with benign lesions.^{5,6} Surgery for benign lesions should ideally be limited to patients with compressive symptoms, Graves’s disease presenting with a nodule, hyperthyroidism, hyperparathyroidism, enlarging nodule. Because of the real problem of morbidity and at times mortality and cosmetic

reasons, surgical excision of a solitary nodule should be preserved for all those thyroid neoplasm whose ultrasound picture are suspicious of malignancy and cytology reveal malignant cells.^{8,9}

According to several reports, for differentiation of benign versus malignant thyroid nodules, sonography has sensitivity rates ranging from 63%to 94 %, specificity from 61% to 95 % and overall accuracy from 80% to 94%.⁷⁻¹⁰



Figure-1: Completesthin halo around a bening thyroid nodule



Figure-2: Incompelete halo sign in biopsy proven follicular carcinoma thyroid

Thyroid lesions with prevalence of halo (71 Total - 100 %)	Halo sign	Number of patients	Percentage%
Benign thyroid lesions (58 total - 81.69 %)	Complete thin halo	20	34.49
	Incomplete halo	9	15.51
	No Halo	29	50
	Total	58	100
Neoplastic thyroid lesions (13 total - 18.30 %)	Complete halo	2	15.38
	Incomplete halo	6	46.15
	No halo	5	38.46
	Total	13	100

Table-1: Nodlarthyroid lesions types with prevalence of halo

Type of Halo	Benign Thyroid Lesions	Malignant Thyroid Lesions	Total
Complete Halo	20 (True Positive)	2 (False Positive)	24
No Halo or Incomplete Halo	38 (False Negative)	11 (True Negative)	11

Table-2: Calculations of complete halo sign's as a predictor for Benign Thyroid lesions

There are many sonography features to predict possible benign or malignant nature of a nodule. Sonolucent Halo is one the features, Halo in benign thyroid lesion is thin and complete because rapid but controlled growth of thyroid cell leads to compression of adjacent parenchyma and which appear as hypo echoic rim around the lesion called as sonolucent halo.

Less frequently malignant thyroid lesion may have uncontrolled and spontaneous cell growth with loss of cellular cohesion can lead to incomplete halo around the lesion.

Most thyroid malignancies are hypoechoic. Most of malignant nodules are ill-defined with irregular margins with thick irregular mostly incomplete or absent hypo echoic halo.

We studied 71 patients with thyroid nodular lesions out of which 58 patient had benign thyroid lesion and out of 58 patient 20 (34.5%) were containing thin complete halo around them. 29 patients (50%) didn't show halo around the nodule while 9 patients (15.5%) showed incomplete halo. Statistical analysis revealed high positive predictive value and specificity of Complete halo for benign thyroid nodular lesion. So it can be postulated that thin complete halo around the thyroid nodule can predict possible benign nature of the nodule.

A peripheral sonolucent halo that completely surrounds or incompletely surrounds a thyroid nodule is presented in 50 % of benign thyroid lesion and 20 patients(34.5%) have thin complete halo. Color and power Doppler imaging have demonstrated thin complete peripheral halo strongly suggestive of benign nodules which represents blood vessels coursing around the periphery of the lesion (the basket pattern).

6 patients out of 11 patients (54.5%) who turned out to have follicular neoplasm demonstrate incomplete halo around them. While 5 patients (45.5%) didn't show halo around the nodule. 2 thyroid nodules showed complete halo which turned out to be malignant nodule on biopsy. 20 patients having benign thyroid lesions containing thin complete halo (figure-1) with most of lesion are of colloid goiter which can be managed nonsurgically and with iodinated salt and thus risky surgery can be avoided. This constitute 34% of our study and thus by identifying this characteristic halo and so benignity we can avoid surgical risk in these patients.

One study described the non specificity of halo sign in 1970 when ultrasound machine were of less resolution as compared to present time high resolution machine. Today high resolution sonography has highest spatial resolution of 0.7mm which is highest among all imaging modality. This can pick up very thin halo around the lesion which is not demonstrated in previous study.

With 20 patients out of 58 patients having benign nodular thyroid lesion had complete thin halo (Figure-1) and 6 patients out of 11 neoplastic thyroid lesion contains incomplete halo (Figure-2) as well only 2 of the neoplastic thyroid lesions patient had complete thin halo. Thus it can be postulated that thin complete halo around thyroid nodule can be taken as strong sign of benignity.

CONCLUSION

From this study it can be postulated that thin complete halo around thyroid nodule can be considered as a very specific sign of benignity. USG of thyroid nodule showing thin complete halo are most likely to have benign thyroid lesions with most of

lesion are of colloid goiter which can be managed non surgically and with iodinated salt. Thus by identifying this characteristic complete halo as a strong predictor of benignity, surgical risk and its complication can be avoided.

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Ethics in Aesthetics, Where to Draw the Line?

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ABSTRACT

Five fundamental principles that form the foundation of dental ethics are patient autonomy, non-maleficence, beneficence, justice and veracity and it's under the guidelines of these ethical obligations that a dentist must perform his duties. The demand for aesthetic dentistry in today's time is at its peak. With many dentists deviating from the path of ethical guidelines to achieve instant and better results than their competitors in the 'market' it becomes imperative to reflect upon decision making in aesthetic dentistry and to not cross the fine line between ethical and unethical practice.

Keywords: Aesthetics, ethics, dentist.

INTRODUCTION

Aesthetic dentistry is the science which treats the conditions of sensuous perception. A pleasing appearance in today's world has become a necessity, the smile being a prime asset to an individual's appearance. Feeling attractive is directly related to elevated self-esteem. However, the objectives of aesthetic dentistry need to be met with unscrupulous treatment, keeping in mind dental ethics and adhering to the above mentioned principles.¹

CRITICAL FACTORS IN DIAGNOSIS

Some patients are concerned about their appearance but are not psychologically affected by it. The interests and expectations of such patients needs to be involved in treatment planning as their decision making skills are not affected whereas the autonomous decision making skills of patients who are psychologically affected by their appearance may be impaired.

It is therefore unethical for the dentist to suggest aesthetic treatment modalities to such patients. The dentist should wait for the patient to enquire about their aesthetic concerns. The patients can be informed about dental procedures to enhance their aesthetics in general and asked if they have any concerns about the appearance about their teeth still giving them the rights to be involved in decision making and treatment planning.

Diagnostic aids like video imaging may be used to show patients a magnified version of their smiles that can help them point out defects like discoloured teeth, malaligned teeth and other discrepancies by themselves.

Goldstein affirms the importance of using Computer-generated imaging, enabling the professional to study and discuss the patient's expectations with the dental professional. Digital smile designing helps to evaluate proper length, width, proportion and even shade issues before treatment is implemented. It enables the patient to see the final result. This technique enables the patient, dentist, and laboratory technician all to view the case preoperatively from frontal, lateral, and full-face perspectives before investing their time and money. Digital dentistry can now be achieved with milling units linked to advanced softwares resulting in improved and prompt smile designing via CAD/

CAM systems. The tooth width can be compared with the facial width using the M proportions (METHOT) software.

Thus, treatment plans should be made by the patient and dentist in tandem with each other depending upon the clinical signs and symptoms and accurate diagnosis of each patient.

CRITICAL THINKING

Covenant fidelity is the inner meaning and intrinsic purpose of our creation as human beings. (Paul Ramsey).

The objective of aesthetic dentistry is to improve smiles, thereby upgrading the patient's self-image. However in pursuit of the perfect, ideal smile that the insistent patient or the overzealous dentist has in mind it is not ethical to sacrifice on the sound dental and periodontal structures into dental dust. The need of the hour is to strike a balance between ethics and the dental practitioner's profit. Monetary gains should be secondary to morals. The dentists should render services.

It was found that extended porcelain veneers in anterior corrections necessitates removal of up to 30% of sound dental tissue removal and 62% to 73% of sound anterior tooth structure during the preparation for all ceramic full coverage crowns.²

These preparations, in a desire for the perfect smile may give rise to endodontic problems that is pulpal involvement of the prepared teeth.

A better understanding of the longer term biological consequences of significant 'cosmetic' interventions and an increasing desire to avoid causing collateral damage has become imminent. Ethics and aesthetics/cosmetics are dependent on the degree of the aesthetic problems and the patients who encounter them.³

Aesthetic dentistry and patient's autonomy will always be subordinate to oral health and this hierarchy needs to be maintained. The patient's oral health should not be compromised to enhance his/her aesthetics.

DECISION MAKING

The patient has every right to information prior to deciding the treatment plan. It is a must for the dentist to provide all the treatment options suitable for the patient and to explain the advantages and disadvantages and possible consequences of each of them. This may at times compromise the patients' standard of healthcare as the patient may not choose the best treatment

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option available professionally due to fiscal or any other valid reason but the dentist in such cases should respect the decision taken by the patient as long as it can be justified ethically.

The dentist at the same time cannot be coaxed into providing treatment to patients when it's not needed. The dentist has every right to deny treatment to patients where professional integrity is challenged. Example- veneers in cases where composite restorations may suffice, extraction of healthy tooth.

It is unethical to provide patients' with composite restorations in posterior teeth without informing the patient about the shortcomings of the dental material. Also, the patient has every right to treatment irrespective of his/her age, race, gender, ethnicity. Also, the dentist cannot refuse treatment to a patient positive with blood-borne diseases or other transmissible infections.

UNETHICAL MARKETING

Another growing concern in today's time is aggressive marketing that the dentists are indulging into to lure patients. Practitioners ought to promise only what can be delivered to the patients without crossing limits of professionalism. 'Misleading reporting' that is delivering distorted information, leaves a wrong impression on the patients. Unethical marketing does not maintain the hierarchy of oral health over dental aesthetics. Its sole purpose is to generate additional business. Care should be taken not to offend other practitioners/colleagues via their marketing strategies.

DUTIES OF THE DENTIST

Patients care should be the dentist's primary concern. Making the patient understand the treatment and at the same time respect their views by involving them in decision making. The dentist should be constantly updated in professional skills and upcoming technologies. Any confidential information of the patient should be protected.

EVALUATION OF EXTRA-ORAL AND INTRA-ORAL FEATURES

Diagnosing and treating aesthetic problems ethically requires an elaborate evaluation of the patient (Table-1).

Extra-oral features	Intra-oral features
Horizontal line of reference. Ophriac line Intra-alar line Bipupillary line Commissural lines	Gingival architecture and bioform
Vertical lines of reference. Mid-facial line	Gingival aesthetic line
Lip-line	Periodontal biotype and bioform
Smile-lines	Tooth morphology
	Incisal embrasure
	Tooth position
	Contact areas
	The golden proportion
	Biologic width
	Aberrant frenum
	Black triangles
	Gingival hyperpigmentation
Table-1: Evaluation of extra-oral and intra-oral features	

HARD-TISSUE CONSIDERATIONS

Square teeth are considered more masculine and round teeth more feminine. Some women demand more rounded shaped teeth whereas men may desire square teeth giving a bolder look. In such cases the dentist should reduce the amount of tooth structure conservatively as the damage done is irreversible.

Cosmetic contouring in cases of crowding may be the treatment of choice for many practitioners however the occlusion of the patient should not be hampered in doing so. The thickness of enamel also should be taken into consideration. Excess reduction of enamel may cause dentine exposure leading to discolouration, also such teeth are more prone to fracture thereby compromising aesthetics. The practitioner has to choose the best option between cosmetic contouring, orthodontics, bonding, crowning or fixed prosthesis with least damage to hard and soft tissues.

SOFT TISSUES CONSIDERATIONS

The human tissue biotype is classified as thin, normal or thick.⁴ In cases with thin biotypes, alveolar dimension preservation is vital to enhance aesthetics. Thin biotypes have a greater prevalence of recession initial gingival thickness being the most predictable factor for the success of complete root coverage procedures (Baldi C, Weisgold).⁵

Gingival scallop morphologies can be high, normal and flat. A high scallop leading to recession and creation of black triangles is noted because of the disparity between the bone contour and the free gingival margin. A discrepancy greater than 4mm is found to be problematic thus making it unfavorable for aesthetics.⁶

The combined dimensions of the connective tissue attachment and junctional epithelium averages to 2.04mm this is called the "biologic width". Aesthetic demands often require "hiding" of restorative margins below gingival margins. Invasion of this zone frequently while placing restorations leads to crestal bone loss, gingival recession, clinical attachment loss and or localized gingival hyperplasia. Authors have recommended minimal requirement of 3 mm to 5 mm of healthy supracrestal tooth structure to allow completion of restorative procedures.

The frenum is considered to play a role in the development of the diastema, sometimes it is thought it can be a result of it. Surgical intervention in children of a young age may not have been necessary, as the diastema has a self-corrective capacity. With the eruption and approximation of the maxillary anterior teeth, the frenum usually undergoes pressure and becomes atrophic.

The saturation of melanin pigments can cause unaesthetic dark gingival display in an otherwise coral pink gingiva. It may be a cause of embarrassment in smile-conscious individuals. It would only be justified to undergo surgical correction for the same only if the patient is fair skinned with moderate to severe gingival pigmentation or in patients with a high smile-line.

TREATMENT COST

The principle of 'veracity' ensures a trustworthy relationship between the dentist and the patient. The dentist has to provide the patient with the treatment plan along with the estimate cost at the very outset. Any failure in doing so is considered to be a serious lapse tantamounting to misconduct. Cases of dentists

deliberately overcharging the patients are not uncommon. Ethical problems related to billing can involve charging fees disproportionate to the services rendered, intended to make undue profit for the dentist rather than being reasonable and fair in the best interests of the individual patient.⁷ Reporting of complex or more expensive procedures than what were actually done and billing for services not rendered are fraudulent.

CONCLUSION

The above mentioned references enable the practitioner to create symmetry and balance from the anatomical features. These hard and soft tissue considerations permit the surgeon to plan more predictable gain in the field of aesthetic dentistry ethically. When these principles are adhered to, they result in a functionally correct and a highly aesthetic smile. It is thus, the duty of the dentist to motivate patients in improving their smiles however bearing in mind the ethical limits thereby not hampering the biology of the dentition and the periodontium in the long term. Adhering to the ethics of dentistry and working with a religious mind with an eye on the patient's welfare rather than money will give dental professionals eternal satisfaction and righteous earnings.

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Analysis of the Outcome of Fracture Femur Surgeries among Adult Population – A Prospective Study

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ABSTRACT

Introduction: Femur fractures have become more common because of ageing process and road traffic accidents among adults which causes significant morbidity and mortality, its trend is also predicted to increase in future. This trend and its complications of femur fracture were not studied widely in India. Objectives: The investigator showed immense interest in investigating the burden, types and surgical complications of femur fractures in a tertiary care hospital.

Material and Methods: The study was done in a tertiary care hospital among adults admitted with fracture femur for a period of five years after getting the informed consent. The outcomes measured were types of fractures, types of surgeries, follow up examination and complications. The data were entered in MS excel sheet and analysis was done using SPSS software.

Results: The study was carried out on 68 patients of which majority 71% were males, 80% were age above 50 years and the most common site of femur fracture was neck of femur and trochanteric fractures then followed by sub-trochanteric fractures. The surgeries preferred in this population were Dynamic Hip Screw, Hip Screw fixation, intramedullary nailing, hemiarthroplasty and total hip arthroplasty.

Conclusion: This study has concluded that the most common fractures were fracture neck of femur and trochanteric fractures with the moderately higher complication rates.

Keywords: Fracture Femur, Fracture neck of femur, Trochanteric fracture, Total Hip Arthroplasty, Hemiarthroplasty, IM nailing, DHS

INTRODUCTION

The **FEMUR** is the longest and the strongest bone in the human body. Its length on average is 26.74% of a person's height¹ a ratio found in both men and women and most ethnic groups with only restricted variation. The anatomy of femur is categorised as a long bone and comprises a diaphysis, the shaft (or body) and two epiphysis or extremities that articulate with adjacent bones in the hip and knee.²

One of the most important and common orthopaedic injury. It is one of the major public health issue due to its association with fragile nature and osteoporosis. Diaphyseal fractures result from significant force transmitted from a direct blow or from indirect force transmitted at the knee.³ Pathologic fractures may occur with relatively little force.⁴ These may be the result of bone weakness from osteoporosis or lytic lesions. With rising life expectancy throughout the globe, the number of elderly individuals is increasing in every geographical region, and it is estimated that the incidence of hip fracture will rise from 1.66 million in 1990 to 6.26 million by 2050.⁵ Primary arthroplasty or open reduction and internal fixation (IF) with nails or screws are the two main options for the treatment of displaced fractures of the neck of the femur.⁶ Some of the factors associated with

femur fracture are obesity, physical activity, calcium deficiency and frequency of falls by the elderly.

Many researchers have explored to demonstrate the geographical variation in prevalence of femur fractures in different parts of the country. This article is discussed with intent to analyse the outcome of fracture femur and its surgical complications.

Present study was undertaken to describe the different types of fracture femurs according to socio demographic variables, to describe the surgical complications associated with fracture femurs among adult population, and to analyze the relationship between the factors causing surgical complications for fracture femurs.

MATERIAL AND METHODS

The present study was a two year prospective study that evaluated 68 patients during 2013 – 2016. These patients were advised for a surgical intervention and were followed for a period of two years. The patients were followed every 3 months and the follow up details were recorded. The patients were interviewed using direct questionnaire method. The study was conducted after getting proper informed consent from the patients and obtaining ethical approval from the Institutional Ethical Board.

Inclusion criteria

All adults with femur fractures were included for the study

Exclusion criteria

Patients associated with psychiatric illness.

Patients who were lost during follow-up or refused to continue in the study

Follow up: The patients were followed up for every 3 months and the patients were clinically assessed for local swelling, movement restriction, abnormal mobility and any deformity. X ray examination follow up was done for assessing the position of implant, wound infection, bone loosening, nailing and screw loosening. Most of the patients showed interest in the study, so the response rate was almost 95%.

STATISTICAL ANALYSIS

The data were entered in the MS excel sheet and analysed using SPSS software 17 version. The data were expressed in percentages and the analysis was done for appropriate

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statistical tests.

RESULTS

The study was carried out on 68 patients of which majority 71% were males, 80% were age above 50 years and the most common site of femur fracture was neck of femur and trochanteric fractures then followed by sub-trochanteric fractures (Table-1). The least common type was fracture shaft of femur which constituted 7.4% of the study population. The fracture shaft of femur and the fracture neck of femur were more common among females than males whereas the sub-trochanteric, trochanteric and intertrochanteric fractures were more common among males. (Table-2) The surgeries preferred in this population were Dynamic Hip Screw, Hip Screw fixation, intramedullary nailing, hemiarthroplasty and total hip arthroplasty (Figure-1 and 2). The post-operative complications rate was more among females than males and it was not statistically significant. The common post-operative complications were perineal tissue injury and rotational deformity followed by malalignment. Only one patient developed angular deformity and three patients developed shortening of the limb. Statistics: The risk factors

like gender, aging and site of surgery were not statistically significant in this study ($P > 0.05$).

DISCUSSION

Femoral bone fractures are significant cause of morbidity and mortality and the loss of quality of life if it happens during the economically productive age group. The morbidities and mortalities have been reduced as the result of changes in fracture immobilization with early mobilization after surgery thus reducing the risk of complication due to prolonged bed rest. Proximal femur fractures are treated based upon fracture pattern.

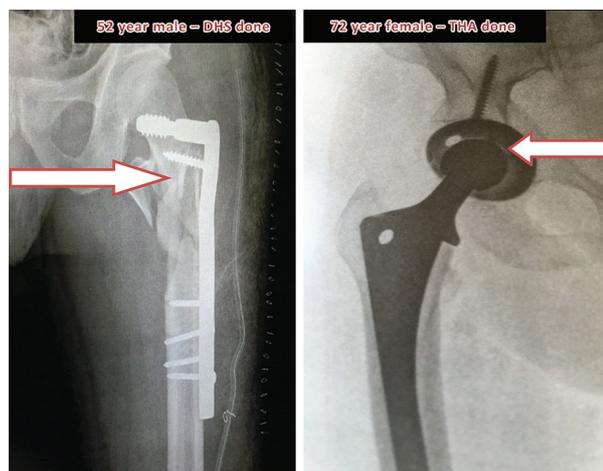


Figure-1: X ray left hip – antero posterior view showing intertrochanteric fracture – dynamic hip screw done in a 52 year male patient and next showing x ray of right hip joint of a 72 year female with total hip arthroplasty done for fracture neck of femur

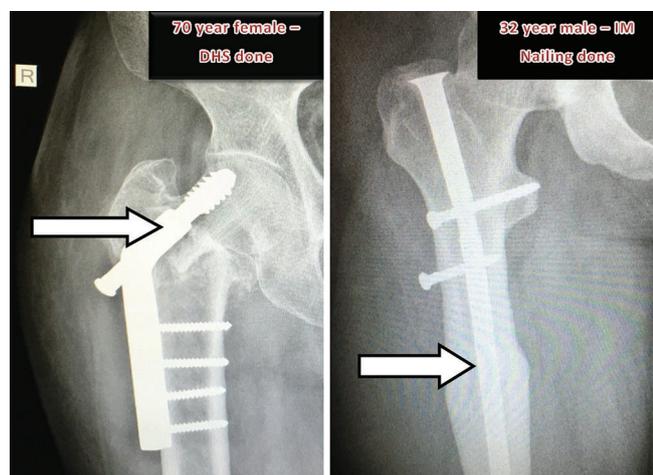


Figure-2: X ray right hip joint in a 70 year old female showing trochanteric fracture with surgical correction done by dhs and showing x ray - right femur shaft fracture with im nailing in a 32 year male

Gender	
Male	48 (71%)
Female	20 (29%)
Age group	
Below 50	14 (20.6%)
Above 50	54(79.4%)
Type of Fracture	
Neck of femur	22(32.3%)
Shaft of femur	5(7.4%)
Sub trochanteric	11(16.2%)
Inter trochanteric	8(11.8%)
Trochanteric	22(32.3%)
Type of Treatments	
DHS – Dynamain Hip screw	31(45.4%)
Hemiarthroplasty	1(1.5%)
Hip screw fixation	13(19.1%)
Im nailing	14(20.6%)
ORIF	4(5.9%)
Proximal femoral nailing	2(2.9%)
THR	3(4.4%)
Complication	
Present	24(35.3%)
Absent	44(64.7%)

Table – 1 – Study population and its distribution in relation to femur fracture

Variable	Male	Female
Age group		
Below 50	14(20.6%)	0(0%)
Above 50	34(50%)	20(29.4%)
Type of fracture		
NOF	10(14.7%)	12(17.6%)
Shaft of femur	0(0%)	5(7.3%)
Sub trochanteric	8(11.8%)	3(4.4%)
Inter trochanteric	7(10.3%)	1(1.5%)
Trochanteric	18(26.5%)	4(5.9%)
Treatment		
DHS	25(36.8%)	6(8.8%)
Hemiarthroplasty	0(0%)	1(1.5%)
Hip screw fixation	5(7.3%)	8(11.8%)
IM nailing	11(16.2%)	3(4.4%)
ORIF	4(5.9%)	0(0%)
Proximal femoral nailing	2(2.9%)	0(0%)
Total Hip Replacement	1(1.5%)	2(2.9%)
Complication		
Present	19(27.9%)	29(42.7%)
Absent	5(7.3%)	15(22.1%)

Table-2: Gender distribution and its relation to type of fractures and treatment

Femoral neck fractures are typically treated with percutaneous pinning, a sliding hip screw or arthroplasty in elderly patients. Peritrochanteric fractures are typically treated with a sliding hip screw or a cephalomedullary nail. Subtrochanteric fractures are typically treated with an intramedullary nail or a fixed angle device. It has been shown by many studies the socioeconomic burden of the hip fractures involving femur fractures will cross 3.85 billion euro by the year 2030.⁷ Of course this study has not included the economic loss and quality of life lost by the patients suffered from femur fractures but the practical complications of traction table during surgeries were taken into account which seemed to be much high compared to other studies. (Table 1 and 2) This study also showed that females showed more complication than males which are supported by many studies conducted in developed countries which may be due the fact that the women are more prone to osteoporosis and hormonal changes.⁸⁻¹² Similarly a large prospective study on outcome of fracture femurs and its surgical complications by Lars Kolmert et al¹¹ showed two thirds of the surgical and non-surgical treatments were satisfactory. Our study also accepts with the same results but in fact little lesser complications with greater satisfaction to the patients and the surgeons. The mean follow up of our patients in this study was only 1.5 years whereas many studies suggested more than 5 years follow up. The results of this study cannot be directly compared with other studies because the study participants belonged to all age groups and the risk factors were not classified.

Conclusion: To conclude, this study had explored the gender distribution of type of femur fractures, different surgical procedures adapted and the post-operative complications with the follow up of 3 years. There was no statistical association found in this study as far as the factors concerned.

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Evaluation of Etiological and High Risk Factors in the Patients of Acute Pancreatitis

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ABSTRACT

Introduction: Acute pancreatitis presents a heavy financial burden on the health care system and significant physiologic stress on the patient. In view of this, the present study was carried out to identify etiological factors and high risk factors in the patients of acute pancreatitis.

Material and Methods: The present retrospective study comprised of thirty patients of acute pancreatitis having specific complaints of pain in upper abdomen with or without radiation to back, nausea, vomiting, abdominal distension etc. with characteristic history of alcoholism, family history etc. The recorded clinical parameters were used to get SIRS criteria within the first 24 hours of admission. The SIRS diagnostic criteria were applied to the recorded clinical parameters within the first 24 hours of the admission.

Results: Etiology was idiopathic in 50% (n=15) while cholelithiasis 26.67% (n=8) and alcoholism 23.34% (n=7) stood next in order. Both underweight and obese patients had protracted disease course; with 100% (n=4) unfavourable outcome in underweight and obese class-II/III patients. Significant disease severity was found in patients with high BMI as findings suggested that mean BMI for mild disease was 24.3 kg/m² and for severe disease it was 30.15 kg/m². Mortality was also higher in obese class of group; with 100% (n=3) mortality.

Conclusion: Obesity can significantly alter the disease process. In this group of patients intensified management is needed. Complications are also expected in this group of patients. Development of positive SIRS response (presence of ≥ 3 positive SIRS diagnostic criteria) on first day of admission can precisely predict the disease severity and thus, unfavourable outcome. This can definitely guide clinician early in clinical phase for targeted management of the affected patient. Need of high dependency care in such patients should be promptly decided so that mortality can be reduced.

Keywords: Acute pancreatitis; Cholelithiasis; Obesity

INTRODUCTION

Acute pancreatitis is a reversible inflammatory process of the pancreas. Even though the disease process may be confined to pancreatic tissue, it can also affect peripancreatic tissues or more distant organ sites.¹ The increased frequency of acute pancreatitis may be due to the rising incidence of obesity, a risk factor for the development of gallstones and, by extension, gallstone pancreatitis. Acute pancreatitis presents a heavy financial burden on the health care system and significant physiologic stress on the patient.² In view of this, the present study was carried out to identify etiological factors and high risk factors in the patients of acute pancreatitis.

MATERIAL AND METHODS

The present retrospective study of thirty patients of acute pancreatitis has been carried out in a tertiary care hospital attached to Medical College between 2012 and 2014. Patients

of all age group and both the sexes with first episode of acute pancreatitis were included in this study. Known or previously admitted patients of acute pancreatitis coming with relapse or recurrence were excluded from the study. Diagnosed case of chronic pancreatitis was excluded.

Patient clinically seeming to be affected with acute pancreatitis having specific complaints of pain in upper abdomen with or without radiation to back, nausea, vomiting, abdominal distension etc. with characteristic history of alcoholism, family history etc. have been admitted to surgery ward. Epidemiological data, clinical exam records, investigations, and other relevant data of the thirty randomly selected patients were recorded in the proforma and these parameters were then used individually or in a defined scoring system to confirm the diagnosis and to assess the progression of the disease in terms of favourable or unfavourable outcome. In this study, favourable outcome is ascribed to survivors without ICU admission or need of surgery and unfavourable outcome is ascribed to nonsurvivors, patient undergoing surgery for local complications and ICU admission. We classified BMI (Body Mass Index) into 5 categories; (underweight [BMI, <18.5kg/m²], normal range [18.5-24.9 kg/m²], pre-obese [25-29.9 kg/m²], obese class I [30-34.9 kg/m²], and obese class II/III [>35 kg/m²]) and the relationship of BMI and severity of the disease and to favourable and unfavourable outcome was done.

Patients presenting with respiratory rate more than 20 per minute and/or chest auscultation suggestive of any abnormal finding i.e. creps, decreased air entry etc., were defined as having respiratory distress. The association of respiratory distress and disease severity and outcome was correlated in study. Association between respiratory distress and necrosis has been assessed.

The recorded clinical parameters were used to get SIRS criteria (systemic inflammatory response syndrome) within the first 24 hours of admission. The SIRS diagnostic criteria were applied to the recorded clinical parameters within the first 24 hours of the admission. Positive SIRS response was attributed to the 3 or more than 3 positive SIRS diagnostic criteria.

SIRS diagnostic criteria

1 TEMP > 38°C or < 36 °C

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- 2 Respiratory rate >20/min or PaCO₂ < 32 torr
- 3 Heart rate > 90/min
- 4 Total leukocyte count > 12000 /mm³, < 4000/mm³ or > 10 % immature band forms.

RESULTS

In this study; out of 30 patients, 10 (33%) patients were in 1-30 year age group, 10 (33%) patients in 31-50 year age group, 9 (30%) patients in 51-70 year age group, and one (4%) patient was of more than 70 years. Two patients were in their extremes of age of which one was 2 years old and the other was 84 years old. Out of these 30 patients, 14 (46%) were females and 15 (50%) were adult male while one (4%) was male child. Of which four females and six males were of 1-30 year age group. Three females and seven males were of 31-50 year age group. Six females and three males were of 51-70 year age group while one female aged more than 70 years (table-1).

Out of the 30 patients clinical data were evaluated and found that all (100%) presented with pain in abdomen. Fever was present in 4(14%) patients. Nausea-vomiting was present in 22(73%) patients. Abdominal distension was present in 15 patients.

Four (14%) patients presented with constipation, anorexia was present in 18 (60%) patients. Significant breathlessness was present in 5(17%) patients (table-2).

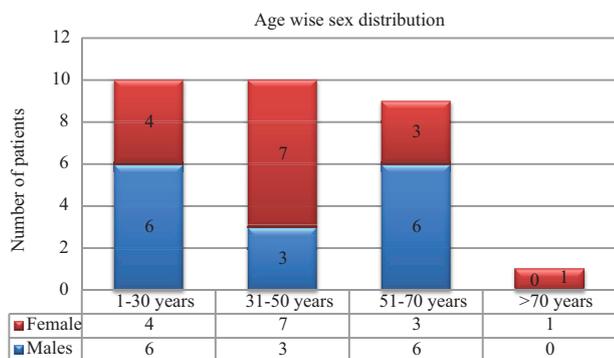
Among these patients, 15 (50%) presented within first day of onset of pain, 7 (23%) had history of pain past two days, 5 (17%) had complaints past three days and 3 (10%) had presented with complaints past 4 days (table-4). 11 (36%) patients had severe agonizing pain, 16 (53%) had dull aching pain of moderate to severe intensity, 2 (7%) had colicky pain and 1(4%) had burning type of pain.

This pain was present in epigastric region in 13 (43%) patients, periumbilical site in 2(7%) patients, both epigastric and periumbilical site in 7 (23%) patients, right hypochondrium and epigastric region in 2 (7%) patients, left hypochondrium and epigastric region in 2 (7%) patients, whole upper abdomen in 1 (3%) patient and in left hypochondrium in 1 (3.3%) patient, hypogastric in 1(3.3%) patient, epigastric, periumbilical and right hypochondrium in 1(3.3%) patient (table-3).

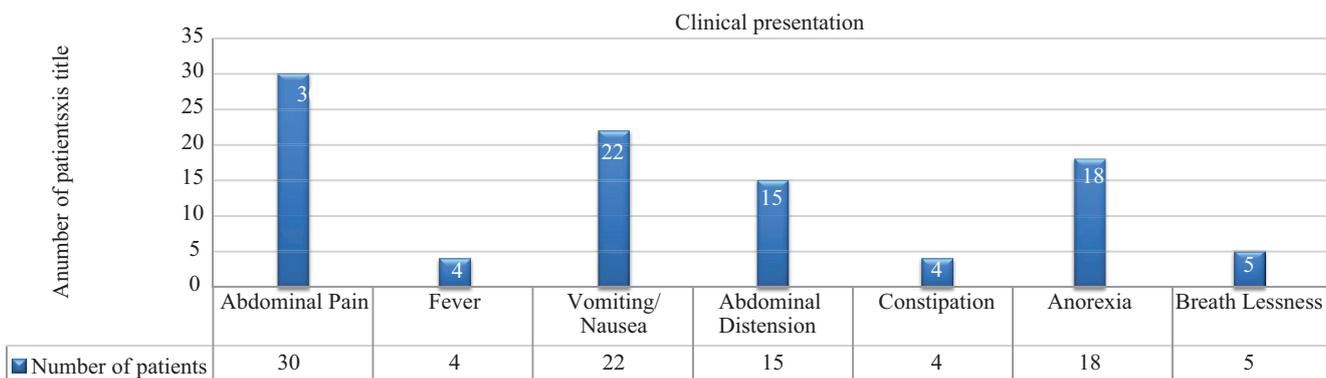
In 9 (30%) patients pain was radiating to back, in 6 (20%) it was radiating to all abdomen, in 3 (15%) it was radiating to periumbilical region. In one (2%) patient each it was radiating to periumbilical and bilateral flank simultaneously and to bilateral flank and bilateral hypochondrium simultaneously in other. In 10 (33%) patients it was non radiating type (table-4).

Pain was aggravated by taking food in 16(53%) patients, by taking food and being in supine position in 11(37%) patients, not aggravated by any factors in 3(10%) patients (table-8). It was relieved by fasting in 9(30%) patients, being in sitting posture in 7(23%)patients, by fasting and being in sitting position simultaneously in 5 (17%) patients and not relieved by any measures in 9(30%) patients.

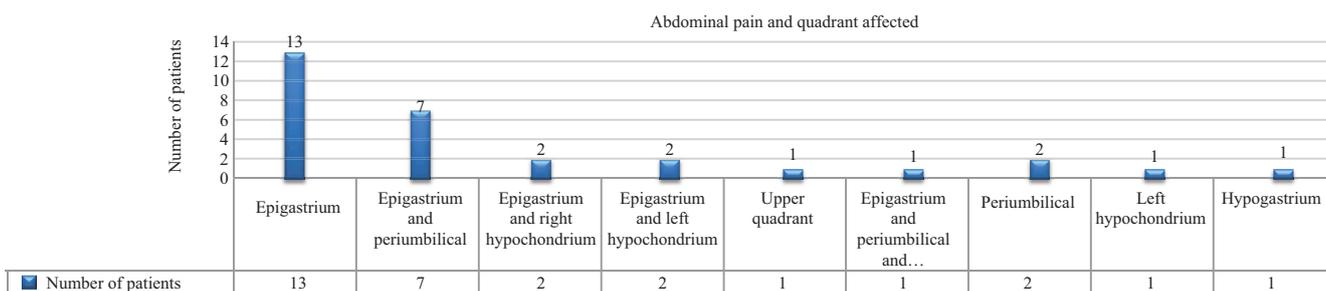
Among 22 patients in whom vomiting was present, vomitus containing clear liquids was present in 7 patients, food particles in 12 patients, bilious in 3 patients.



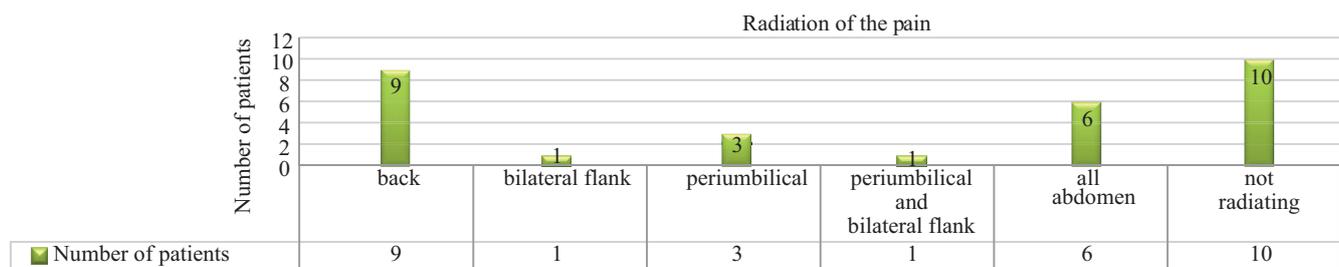
Graph-1: Age wise sex distribution of patients



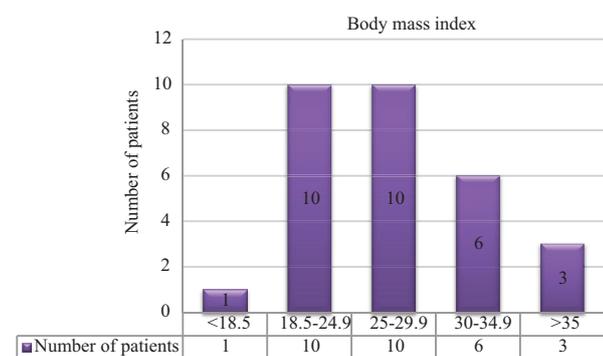
Graph-2: Clinical presentation of patients



Graph-3: Distribution of patients according to abdominal pain and affected quadrant



Graph-4: Distribution of patients according to radiation of pain



Graph-7: Body Mass Index

Out of these patients, 7 (23%) patients were known case of hypertension, 1 (3.3%) was known case of diabetes mellitus while one patient was suffering both from diabetes mellitus and hypertension. In the study one (3.3%) patient had hypothyroidism, one (3.3%) had history of jaundice and one (3.3%) had history of convulsion for he was under the treatment (table-5).

Detailed personal history assessment lead us to identification of 7 (23%) chronic alcoholic patients out of which 2 were chronic tobacco chewer and one was chronic smoker.3 patients were chronic bidi smoker and 4 were chronic tobacco chewer. Out of 7 hypertensive patient one was smoker, 1 diabetic patient was chronic alcoholic and 1 diabetic and hypertensive patient was chronic smoker as well as chronic alcoholic (table-12).

Of the thirty patients on arrival clinical parameters were recorded and evaluated; it was found that temperature was normal in 22 patients, more than 37.1°C in 7 patients and lower than 36°C in 1 patient. Pulse was more than 110/min 13 patients, 90-120/min in 12 and less than 90/min in 5 patients. Respiratory rate was more than 20/min in 16 patients, between 18 to 20 in 8 and 12-18 /min in 6 patients

Fifteen (50%) patients had pallor, two (7%) had icterus and two (7%) had bilateral pedal edema (table-6).

On measuring Body Mass Index (table-7) it was found that; 1 (3.3%) patient had BMI less than 18.5kg/m² (underweight), 10 (33.33%) patients had BMI ranging 18.5-24.9 kg/m² (normal), 10 (33.33%) patients were preobese with BMI 25-29.9 kg/m², 6 (20%) patients had BMI between 30-34.9(class 1 obesity), and 3 (10%) were in obese class 2/3 with BMI ranging >35 kg/m².

On systemic examination respiratory complications were found in 16 patients with 9 patients having lower zone creps, 5 patients having bilateral lower zone reduced air entry, one had right lower zone creps and one had left lower zone creps. Both cardiovascular and central nervous system examinations were near normal in every patient on arrival.

Comorbid condition	Number of patient		
	Male	Female	Total
Hypertension (23%)	2 (7%)	5 (16%)	7 (23%)
Diabetes mellitus (3.3%)	1 (3.3%)	0	1 (3.3%)
Hypertension and diabetes mellitus(3.3%)	1 (3.3%)	0	1 (3.3%)
Jaundice (3.3%)	1 (3.3%)	0	1 (3.3%)
Convulsion (3.3%)	1 (3.3%)	0	1 (3.3%)
Hypothyroidism (3.3%)	0	1 (3.3%)	1 (3.3%)

Table-5: Distribution of patients according to comorbid conditions

Positive general examination findings	Number of patients
Pallor	15 (50%)
Icterus	2 (7%)
Bilateral pedal edema	2 (7%)
	Total= 19

Table-6: Positive general examination findings

Per abdominal inspection		Number of patient	Total
Contour	Globular	13 (43%)	30 (100%)
	Scaphoid	9 (30%)	
	Distended	8 (27%)	
Limitation of respiratory movement	Present	5 (17%)	30 (100%)
	Not present	25 (83%)	
Per abdominal palpation		Number of patients	Total
Local temperature	Elevated	4 (13%)	30 (100%)
	Normal	26 (87%)	
Tenderness	Present	30 (100%)	30 (100%)
Gurading	Present	30 (100%)	30 (100%)
Rigidity	Present	13 (43%)	30 (100%)
	Not present	17 (57%)	
Organomegaly/lump	Not present	30 (100%)	30 (100%)

Table-8: abdominal examination

On per abdominal inspection (table-8); 13 had globular, 9 had scaphoid and 8 had distended abdominal contour. Limitation of respiratory movement was present in 5 patients. On palpation; in 4 cases local temperature was raised, in all patients, tenderness and rigidity was present; and in only 13 patients guarding was present. In all patients, organomegaly was absent.

On percussion in 5 (17%) patients, tympanic sound was present in periumbilical region; while fluid thrill with dull node was present in one (3.3%) patient.

On auscultation; in 5 (17%) patients bowel sound was sluggish, in 4 (13%) patients bowel sound was not heard and in rest 21 (70%) patients it was present normally. At time of presentation,

clinical diagnosis of acute pancreatitis was kept in 15 patients and was not in the other 15 patients.

On laboratory investigation, leukocytosis (total leukocyte count > 11000/mm³) was present in 17 (57%) patients, in one (3%) patient it was below 4000/mm³, and in 12 (40%) patients it was within normal range; between 4000-11000/mm³.

Clinical course of all thirty patients (table-9) was observed very carefully. Assessment of SIRS criteria in the first 24 hours of the admission, lead us to the observation that 9 (30%) patients had single positive SIRS criteria, 8 (27%) patients had two positive SIRS criteria while 9 (30%) had three positive SIRS criteria and 4 (13%) had all four SIRS positive criteria.

DISCUSSION

Acute pancreatitis is the most common disease of the pancreas, and is a significant cause of morbidity and mortality in patients admitted with abdominal pain. The etiology varies among countries. Bile stones and alcohol remain the main causes, accounting for about 70% of cases. The etiology is reported as unknown in 10%-20%, which is unfortunate, because patients with this illness are at risk of new attacks.³

In this study out of 30 patients, male were 53% (n=16), females were 47% (n=14) with mean age of the study group was 41 years. For male patients, mean age was 38 years and for females, it was 46 years. Table-10 describes comparison of sex wise age distribution with various studies.

In this study 13 patients (43.34%) had mild, 8 patients (26.67%) had moderate and severe disease each. One patient (3.33%) had critical disease.

On determining severity; for mild disease mean age was 31 years, for moderate disease it was 48 years, for severe disease it was 49 years and one patient had critical disease aged 35 years. For unfavourable outcome mean age was 52 years excluding one patient aged 2 years. And for favourable outcome mean age was 38 years. Patients who had expired had mean age of 62 years. Garcea G et al,⁷ reported that mean age of unfavourable outcome was 66 years and mean age of favourable outcome was 55 years. On sex wise severity distribution it was found, 62% (n=10) males had favourable and 71% (n=10) females had

favourable outcome.

Middle aged (>45 years) patients, more so females with high BMI (>25kg/m²) have more profound disease course. Patients with BMI >30 kg/m² have more severe disease course and more chances of unfavourable outcome and mortality. Obesity thus can significantly alter the disease process. In this group of patients, intensified management is needed. Complications are also expected in this group of patients. Taguchi Met al⁸ reported underweight or overweight was the independent risk factor for mortality in acute pancreatitis.

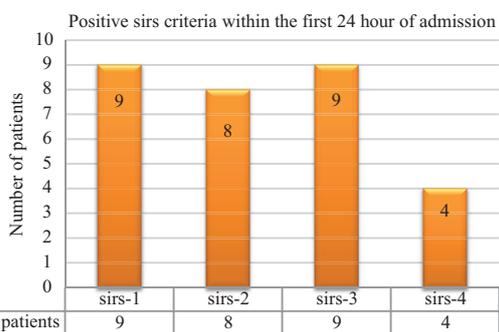
On etiological factor evaluation, alcohol induced pancreatitis was present in exclusively male patients and in our study biliary diseases were present in female patients. For cholelithiasis induced pancreatitis, mean age of presentation was 45 years and alcohol induced pancreatitis, it was 40 years. In our study, most common etiology is unknown/idiopathic comprising 50% (n=15), cholelithiasis induced with 26.67% (n=8) is second common and alcohol induced with 23.34% (n=7) as a third common. Khanna AK et al⁶ reported cholelithiasis as most common etiology followed by alcohol and unknown/idiopathic cause.

On systemic examination, 16 (53%) patients had some positive respiratory finding i.e. hypoxemia, respiratory rate >20/min, auscultatory respiratory examination; indicating underlying systemic complication of the disease, 8 (50%) had developed severe disease, 6 (38%) had developed moderate disease, one (6%) had critical and one (6%) had mild disease. Among four deaths including one in postoperative patient, all were suffering from significant respiratory distress for which appropriate measures were ensued. Out of these 16 patients, 13 (81%) underwent CECT scan and it was found that 4 (30%) had edematous pancreatitis, 9 (70%) had necrotizing pancreatitis. Browne et al⁹, and Jacobs et al¹⁰ also reported respiratory distress as a systemic cause.

In this study, among 13 (43%) patients who had ≥3 positive SIRS criteria within 24 hours of admission, 10 (77%) patients had unfavourable outcome. Among patients with positive SIRS criteria ≥3, four (31%) had died. Patients with ≥3 positive SIRS criteria had mean duration of hospital stay of 13 days. Positive SIRS response is attributed to the patients with three positive features of SIRS criteria. And critical disease severity is included in severe acute pancreatitis for comparison purpose. Khanna AK et al⁶, reported unfavourable outcome among patients with positive SIRS criteria

CONCLUSION

The present study found that knowledge of important etiological factors can help the surgeon and physician to predict the disease severity beforehand and disease outcome in early phase. This can play an important role in effective management of each patient. Middle aged (>45 years) patients, more so females with high



Graph-9: Positive SIRS criteria within the first 24 hour of admission

Study	Mean age for a study (In years)	Sex wise age distribution (In years)	
		Male	Female
Present study (n=30)	41	53% (n=16)	47% (n=14)
Albulushi A et al, ⁴ (n=174)	44	54% (n=95)	45% (n=79)
Madson OG et al, ⁵ (n=122)	51	69% (n=84)	31% (n=38)
Khanna AK et al, ⁶ (n=72)	40.5	51% (n=37)	49% (n=35)

Table-10: Comparison of sex wise age distribution with various studies

BMI (>25kg/m²) have more profound disease course. Patients with BMI >30 kg/m² have more severe disease course and more chances of unfavourable outcome and mortality. Obesity thus can significantly alter the disease process. In this group of patients, intensified management is needed. Complications are also expected in this group of patients.

Development of positive SIRS response (presence of ≥ 3 positive SIRS diagnostic criteria) on first day of admission can precisely predict the disease severity and thus unfavourable outcome. This can definitely guide clinician early in clinical phase for targeted management of the affected patient. Need of high dependency care in such patients should be timely decided so mortality can be reduced.

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Histological Spectrum of Urothelial Lesions – Experience of A Single Tertiary Care Institute

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ABSTRACT

Introduction: Bladder cancer is the 7th most common cancer worldwide, Urinary bladder carcinoma accounts for about 3.2% of all cancers worldwide and is considerably more common in males than in females with a ratio of about 5:1. Non-neoplastic lesions usually encountered in the bladder are chronic non-specific cystitis, granulomatous cystitis, metaplastic conditions and malakoplakia. Aim of the present study was to analyse the histopathological features of various lesions in bladder biopsies and to study the frequency of different pathological lesions of urothelial carcinomas in biopsies and cystectomy specimen at a tertiary care institute.

Material and Methods: All the data was retrieved from the archives of Department of Pathology over a period of 3 years from August 2012 to July 2015, and the results were assessed according to their histology as biopsy is the gold standard for diagnosis and categorization.

Results: During this period, total cases were 38 among which 31.5% were non-neoplastic lesions and 68.5% were neoplastic lesions. Of the neoplastic lesions 84.6% were urothelial carcinomas of varying grade and 15.4% were squamous cell carcinomas. The male to female ratio was 5:1. The commonest age group was seen in the 41-60 years. Out of 26 cases of urothelial carcinomas, six (23%) were low grade and eighteen (77%) were high grade neoplasms.

Conclusion: Neoplastic lesions were more common than non-neoplastic lesions which were more common in the elderly age with prevalence in males.

Keywords: Urothelial lesions, Bladder carcinoma, Non-neoplastic lesions, Neoplastic lesions.

carcinomas in biopsies and cystectomy specimen at a tertiary care institute.

MATERIAL AND METHODS

The present study was approved by the Institute Ethical Committee.

Source and method of collection of data: This was a three year study conducted in the Department of Pathology, Guntur Medical College, Guntur from August 2012 to July 2015. All patients who visited the Surgery/Urology outpatient department and presenting with signs and symptoms pertaining to urinary system like haematuria, dysuria etc. were included in the study. Cystoscopic bladder biopsies were performed. The biopsies were preserved in 10% formalin.

Inclusion Criteria: All cystoscopic biopsies taken from the urinary bladder and renal pelvis, received in Department of Pathology, Guntur Medical College, Guntur were considered for the study.

Exclusion Criteria: Inadequate bladder biopsy was defined as that biopsy which could not be interpreted by the pathologist due to an inadequate tissue content or poor preservation during its transfer to the pathology department, or biopsy of bladder cancer lacking muscular tissue for pathologic staging.

Gross examination was done, the tissues were processed for paraffin blocking. Four micron sections were cut and are stained with haematoxylin and eosin. The histological features were studied and relevant findings were noted.

STATISTICAL ANALYSIS

Microsoft office 2007 was used to generate tables. Results of the study are based on descriptive statistics and presented as mean and percentage.

RESULTS

38 urinary bladder biopsies were studied which included patients of all age groups, ranging from 9-76 years. The maximum number of cases were seen in between 4th to 6th decades of life with maximum cases seen in 41-60 years of age with 16 cases

INTRODUCTION

Diseases of the urinary bladder both non-neoplastic and neoplastic are responsible for significant morbidity and mortality. Despite the improved methods of diagnosis and treatment, they pose biologic and clinical challenges. Cystoscopy is the primary diagnostic tool for patients who are suspected of having bladder tumours, which allows a direct visualization of the bladder mucosa and biopsies of the suspected lesions. An accurate diagnosis of urinary bladder lesions requires simultaneous data from urology, radiology and surgical pathology labs. The non-neoplastic lesions especially cystitis constitute an important source of symptoms and signs. These diseases are more disabling than lethal. Neoplastic lesions are responsible for significant morbidity and mortality. Bladder tumor is the seventh most common tumor worldwide. Urothelial carcinoma is the commonest type accounting for 90% of all primary tumors of the bladder.¹

Aim of the present study was to analyse the histopathological features of various lesions in bladder biopsies and to study the frequency of different pathological lesions of urothelial

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(42%) The least number of cases were seen in the extremes of age groups. In the present study there were 28 male patients (73.6%) and 10 females (26.3%) (Table-1). Among the 38 cases, 12 were non- neoplastic and 26 were neoplastic lesions (Table-2).

Of the 12 non-neoplastic lesions, there were 8 cases of non-specific cystitis, two cases of exostrophy showing metaplastic changes and one case of Cystitis glandularis (Table-3).

Among the neoplastic lesions most of the cases were in the 5th and 6th decade of life with as many as 16 cases (42%) together and more than half of them were males. Of the 26 neoplastic lesions, 22 cases were papillary urothelial carcinomas and four cases were squamous cell carcinoma. Of the 22 papillary urothelial carcinomas, 6 cases were low grade papillary urothelial carcinomas, 8 were high grade urothelial carcinomas and 7 cases were high grade urothelial carcinoma showing squamous differentiation and one case of high grade urothelial carcinoma of ureter. Of the 6 low grade papillary urothelial neoplasms, 3 were non-invasive and 3 were invasive carcinomas (Table-4).

In the present study 69.3% were non-invasive and 30.7 % were invasive tumors with a male to female ratio of 5:1 with a higher incidence in 4th to 6th decade of life. Inflammatory lesions were common in younger age group, whereas the neoplastic lesions were common in the older age group with a predominance in males.

DISCUSSION

The urinary bladder and renal pelvis are more common sites for urothelial carcinomas, than the ureters and urethra² In general, the prevalence of bladder tumours in developed countries is approximately 6-times higher compared to developing countries. Urinary bladder lesions, non-neoplastic and neoplastic are collectively responsible for significant morbidity and mortality throughout the world. Cystoscopy is the primary diagnostic tool for the patients, who are suspected of having bladder tumors, which allows a direct visualization of the bladder mucosa and biopsies of the suspected lesions.

Bozzoni in 1805 described the first cystoscope consisting of a metal tube which on the extravescicle end applied a spark plug through which the vesicle field was illuminated and limited at the other end of the tube. The first bladder biopsy forceps were independently described by Young and Manon in 1929 by which it was possible to extract portions of tumor tissue.³ The role of pathologist is just not limited to its diagnosis, but also gives additional information that can have impact on the treatment and outcome of the patient.

Most common non-neoplastic lesions of the bladder, renal pelvis and urethra are chronic non-specific cystitis with histological variants like follicular, eosinophilic and xanthogranulomatous types, Granulomatous cystitis, metaplastic changes and malakoplakia.

In the present study there were 9 cases of chronic non-specific cystitis, whose ages ranged from 16 years to 62 years. Microscopic picture showed edematous lamina propria and infiltration by chronic inflammatory cells with overlying normal urothelium which were similar to the study done by SriKouSthubha where 84% of the non-neoplastic lesions were inflammatory lesions.

We have one case of Von Brunn's nest with cystitis cystica was

Age	Male	Female	Total	Percentage (%)
1-10	2		2	5.2%
11-20	1	1	2	5.2%
21-30	1	1	2	5.2%
31-40	4	3	7	18.4%
41-50	6	2	8	21%
51-60	6	2	8	21%
61-70	6	1	7	18.4%
71-80	2	-	2	5.2%
Total	28	10	38	100

Table-1: Distribution of Urothelial lesions

Type of Lesion	No. of cases	Percentage (%)
Non-Neoplastic	12	31.5%
Neoplastic	26	68.4%
Total	38	100

Table-2: Distribution of Lesions

Diagnosis	No. of cases	Percentage (%)
Chronic non-specific Cystitis	9	75%
Metaplastic changes	2	16.6%
Cystitis glandularis	1	8.3%
Total	12	100%

Table-3: Distribution of Non-neoplastic lesions

Diagnosis	No. of cases	Percentage (%)
LGPUN	6	23%
HGPUN	9	34.6%
HGPUN with squamous differentiation	7	26.9%
SCC	4	15.3%
Total	26	100%

Table-4: Distribution of Neoplastic lesions

noticed in a 39 year old male, in the region of trigone, in which the urothelium showed a solid invagination into the lamina propria, some of them had lost connection with the surface urothelium.

In the present study, bladder carcinoma was more common in males when compared to females with a ratio of 5:1 which is comparable to the studies done by Johansson SL et al in where it ranges from 3:1 to 4:1.3. The incidence was less in females because of less exposure to industrial carcinogens and a few women who smoke when compared to men.

In the present study, 19 cases of urothelial carcinoma of varying grades and 07 cases of High grade papillary urothelial neoplasm (HGPUN) showing squamous differentiation were seen out of a total 38 cases. Squamous differentiation within an urothelial carcinoma occurs in approximately 21% of urothelial carcinomas of the bladder and in 44% of tumors of the renal pelvis. The frequency increases with tumor grade and stage.^{4,5} Patients with urothelial carcinomas containing abundant squamous differentiation may have a worse prognosis, possibly because they are typically associated with a higher grade urothelial carcinoma. Also, some studies have shown that tumors with squamous differentiation may be more resistant to systemic chemotherapy and radiation treatment.⁵⁻⁷

In most of the studies, less than 10% of low grade carcinomas invade, but as many as 80% of high grade urothelial carcinomas

are invasive.⁸ In the present study, out of 06 low grade Urothelial carcinomas only 3 cases (50%) showed lamina propria invasion and out of 16 high grade Urothelial carcinomas 10 (62.5%) showed lamina propria invasion and muscular invasion.

Urothelial carcinomas are known to exhibit a variant or divergent differentiation like squamous, glandular, micropapillary, sarcomatoid, nested, microcystic, small cell, clear cell, lymphoepithelial, rhabdoid, lipid rich, plasmacytoid and undifferentiated types. Mentioning about a note on differentiation in histopathology report is useful as it has both prognostic and therapeutic implications.

Squamous cell carcinoma (SCC) of the bladder arises frequently in the setting of chronic irritation, whether the source of the irritation is smoking, schistosomiasis, or other causes of repetitive trauma.⁹ These conditions, however, do not appear to be important in the pathogenesis of urothelial carcinoma with squamous differentiation.¹² The prevalence of SCC varies in different parts of the world, accounts for 3-7% in the United States but as much as 75% in Egypt where schistosomiasis is endemic.¹¹ In the present study, SCC constituted 15.3% which was on higher side when compared to western countries and it could be due to smoking because all the cases of SCC were seen in males in the present study.

In this study we found that the Urothelial carcinomas with squamous differentiation were present in more aggressive carcinomas with moderate or poor differentiation and with deeper invasion.

CONCLUSION

In the present study chronic non-specific cystitis constitutes the bulk of the non-neoplastic lesions and maximum number of neoplastic lesions were Urothelial origin. Urothelial carcinoma displays many forms, and some of these variant morphologies may pose diagnostic difficulties because of their similarity to other malignancies and / or benign lesions. Additionally, it is important to recognize the variants that are associated with different outcomes from conventional urothelial carcinoma. For these reasons, familiarity with the diverse morphology of urothelial carcinoma is not simply an academic exercise but is important in providing quality care for patients as they have prognostic significance.

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Biopsy- A vision of life

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ABSTRACT

Term biopsy is derived from Greek word 'bios' and 'opsis' meaning life and vision respectively. It refers to tissue specimen taken from a living organism for the purpose of microscopic examination. Biopsy procedure is a surgical procedure which involves obtaining of a living tissue specimen for performing diagnosis. Biopsy is usually indicated for obtaining a final diagnosis on the basis of histopathological features. With the help of this final diagnosis, treatment planning is done. Biopsy also plays a very important role in establishing prognosis of malignant and premalignant lesions and conditions. Each method has its own advantages and disadvantages. Therefore, the clinician must choose the type of biopsy method very wisely so as to reach the best diagnosis in shortest period of time.

Keywords: Biopsy, Histopathological, Malignancy

INTRODUCTION

The word biopsy is derived from Greek word 'bios' and 'opsis' meaning life and vision respectively. Tissue taken from a living organism for the purpose of microscopic examination is known as biopsy. Biopsy procedure is a surgical procedure which involves obtaining of a living tissue specimen for performing diagnosis. The current gold standard for diagnosis is the histopathologic assessment of a tissue biopsy of the suspicious lesion.² with the help of this technique, establishment of the histological characteristic of suspect lesions, their differentiation, extent or spread can be done and subsequently, a treatment protocol can be adopted.¹

NEED OF BIOPSY???

Biopsy is usually indicated for obtaining a final diagnosis on the basis of histopathological features.² With the help of this final diagnosis, treatment planning is done. Biopsy also plays a very important role in establishing prognosis of malignant and premalignant lesions and conditions. Also knowing the prognosis helps in determining the morbidity and mortality of a patient as well as efficacy of the treatment.³

INDICATIONS

For lesions that exist for more than 2 weeks in the site even after removal of the irritating factor and etiology, biopsies are strongly indicated.³ After a 2- week period, any remaining abnormality or any lesion that proves refractory to local therapy is indicated for biopsy.⁴

- i. **Cystic lesion:** Biopsy is strongly recommended in case of cystic lesions no matter how confident the clinician is about the clinical diagnosis, the reason behind this is that various cysts have different prognosis and aggressive nature is also exhibited by some cysts which will change the treatment plan.^{1,4}
- ii. **Hard tissue lesions:** Most of the bony lesions cannot

be diagnosed exclusively based on their radiographic appearance. Biopsy is required for shortlisting final diagnosis out of provisional diagnosis.⁴ A biopsy is also indicated in the case of bone lesions accompanied by pain, sensitivity alteration or other symptoms, and in application to bone lesions showing important changes or rapid expansion as evidenced by successive radiological evaluations.

- iii. **Oral mucosal lesions:** Biopsy is strongly indicated in any lesion which show change in color, or show any kind of proliferative, ulcerative or abnormal growth.¹
- iv. **Persistent lesions:** Lesions that persist for a longer time even after the removal of irritating factor.³
- v. **Premalignant state:** Those lesions, in which malignant transformation is suspected, are strongly indicated for biopsy.⁵
- vi. **Level of malignancy:** Biopsy is used for defining the extent of a disease process is a neglected aspect of clinical pathology.⁶
- vii. **Idiopathic etiology:** biopsy is indicated in those lesions which have unclear or unknown etiology.
- viii. **Systemic illness:** it is also indicated in those few systemic diseases like lupus, amyloidosis, scleroderma, or sjogren's syndrome that need a histological confirmative diagnosis.
- ix. **Infectious origin;** Biopsy confirmation is required in few infectious diseases like syphilis.⁷

CONTRAINDICATIONS

Oral mucosal biopsy is not needed in normal oral mucosa. Also the lesions that resolve after the removal of irritant require no intervention.

Few conditions that contradict the biopsy are

- i. **Seriously ill patients:** Contraindicated in those lesions in which biopsy could secondary infect the lesion.
- ii. **Deep lesion:** In very deep lesions in which there are chances of damage to adjacent structures.
- iii. **Multiple neurofibromas:** there is a risk of malignant transformation in these cases.
There is no need to biopsy inflammatory or infectious lesions that respond to specific local treatment, as pericoronitis, gingivitis or periodontal abscesses.
- iv. **Vascular lesions:** there are chances of excessive bleeding

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in cases of vascular lesions.⁷

The standard biopsy techniques may require modification in some patient; including those with conditions that preclude the safe use of local anesthetic and those with severe bleeding diatheses or coagulopathies.³

- v. **Esthetic reasons:** Biopsy is contraindicated in lesion in which biopsy can cause esthetic changes.⁸
- vi. **Site with difficult homeostasis:** Sites which are richly supplied by vasculature and in which there are chances of improper healing, biopsy should be done with great caution.
- vii. **Bisphosphonate therapy:** Due to risk of development of osteoradionecrosis.⁹

TYPES OF BIOPSY

Biopsy reports, to a great extent are dependent upon the amount and the type of tissue specimen obtained from the lesion site. Depending upon location, depth and various other parameters, biopsy can be of various types.⁴ Therefore; biopsy can be of following types as shown in Table-1.^{1,10}

INCISIONAL BIOPSY

In order to make definitive diagnosis, removal of a representative sample of the lesion and normal adjacent tissue is done. If the lesion is extensive, different samples should be obtained, placing each of the in a separate and adequately identified container.¹

Advantages

1. Only a small fragment of tissue is required.¹¹

Depending on the characteristics of the target lesions	Direct (located superficially, with easy access)
	Indirect (when the lesion lies in depth and is covered by normally appearing mucosa or tissue)
Depending on the technique used	Incisional
	Excisional
Depending on the material employed	A conventional scalpel
	A punch
	Electro scalpels
	Co2 laser
Depending on the processing of the sample	Paraffin embedded
	Analyzed frozen
	Embedding in methacrylate
Depending on the clinical timing	Intra-operative
	Extra-operative
Depending on the location of the target lesion	The salivary gland
	Bone
	Lymph nodes
	Other head and neck tissues
Depending on the purpose of the biopsy	Diagnostic
	Experimental
Depending on the time	Pre-operative
	Intra-operative
	Post-operative

Table-1: Types of biopsies

2. Can be done in cases of suspected malignancy and premalignancy.
3. In cases in which is difficult to excise the lesion due to large size.¹
4. It is also used in establishing the diagnosis systemic and autoimmune disease process
5. If the lesion is ulcerated, the clinician should strive to include a portion of the adjacent intact epithelium in the specimen.

Disadvantages

May increase the risk of metastasis of malignant lesions.

Avoided in vascular cases as it may cause profuse bleeding.⁹

EXCISIONAL BIOPSY

Involves complete excision of the affected lesion for both the diagnostic and therapeutic purposes. This type of biopsy is mostly recommended in those cases in which the size of biopsy is small.³

Advantages

- Complete removal of the lesion.⁸
- Most appropriate for small peripheral benign lesions.⁴
- This is the ideal method of diagnosis of small melanomas (when performed as an excision).
- For small, pedunculated, exophytic growths.³

Disadvantages

- Difficult to perform in large lesions.
- Should be avoided in cases where a high grade malignancy is suspected.⁹

SCALPEL BIOPSY

Tissue sampling is most commonly done using a scalpel blade.

Advantage

- Recommended in cases of peripheral benign lesions.
- In cases of oral mucosal lesion.

Disadvantage

- Vague histopathological definition histological misinterpretation resulting in false negatives and false positive should be kept in mind while interpreting the results of scalpel biopsies.¹⁰
- In case of extensive lesions, it should be avoided as it can lead to misdiagnosis.¹¹

Variants of scalpel

- Electro scalpel
- Laser scalpel

PUNCH BIOPSY

Punch biopsy is usually used as an alternative to incision biopsies for small lesion at an accessible site. The lateral tongue and buccal mucosa are appropriate sites for punch biopsy, as it must be feasible for device to approach the mucosal surface perpendicularly.⁸

Advantages

- Rapid, simple, safe and inexpensive technique for obtaining a representative sample of most oral zones
- Good esthetic results due to better and fast wound healing.¹
- The punch is able to obtain several samples at the same time, and at different points, and generates less patient anxiety than the conventional scalpel.¹²

- produces fewer artifacts than the scalpel biopsy²

Disadvantages

- In case of larger lesions, it should be avoided as intensely vascularized or innervated areas cannot be sampled by this method.
- Not recommended in case of deep lesions and is limited to epithelial or superficial mesenchymal target tissues.¹
- Caution should be taken while biopsying areas which are near to normal anatomical structures.
- Not indicated for vesiculo-bullous lesions.⁸

B- FORCEP

Bermejo developed this instrument for helping in measuring the depth of the samples to facilitate better sectioning. The forceps are equipped with two cusps- one with a window- to allow compression of the target tissue between them. The target zone is positioned exposed within the window, and compressive effect of the cusps allows us to work in an ischemic field within the window. Compression by the forceps causes the sectioned portion, freed from its peripheral connective tissue attachments, to propel from window.¹³

FROZEN SECTIONS

For rapid diagnosis during intra-operative period, the sampled material is processed without fixation, frozen with dry ice.¹ Frozen sections can be fixed, stained, and mounted for permanent reference.⁶ A specimen processed in this manner is not satisfactory for detailed study of the cells, but it is valuable because it is quick and gives the surgeon immediate information regarding the malignancy of a piece of tissue.

Advantages

- Differentiate between benign and malignant state and between type malignancies.
- Evaluate tissue margins for involvement by malignancy, e.g. basal cell carcinomas.
- Determine type of tissue, e.g. Differentiate lymphoid tissue from parathyroid gland.
- For generating reports during intra-operative sites.¹⁴

Contraindications

- For Hard tissue biopsies.
- For extensive complex lesions.

BRUSH BIOPSY

It is a noninvasive method of evaluating oral mucosal lesions for cellular dysplasia and atypia. It is a three layer Trans-epithelial exfoliative cytology technique.¹⁴ A brush biopsy was initially introduced for cervical smears in gynecological lesions and was later modified for oral smears too. This technique demonstrated better cell spreading on the objective slides compared with smears obtained by using the conventional wooden spatula as well as an improvement in the cellular adequacy of the smears.¹⁰ Brush biopsy is strictly indicated for mass screening of suspected premalignancy and malignancy.⁴

Advantages

- In contrast to exfoliative cytology, the brush biopsy collects cells from the full thickness of the oral epithelium.
- Non-invasive, chair side procedure, easy to perform and painless.

- Dysplasia can be ruled out
- High sensitivity and specificity
- Suspected cases of candidiasis can be rapidly confirmed through oral cavity.⁴

Disadvantages

- Cannot be used as a substitute for scalpel biopsy
- Significant false finding may be observed due to sampling error.¹⁴

FINE NEEDLE BIOPSY

Fine Needle biopsy (FNB) is a minimally invasive technique which is particularly suitable for those sensitive areas where an incisional biopsy is contraindicated or is not possible. Although it does not provide a definite type specific diagnosis, it is used in conjunction to the clinical and radiological findings to rapidly provide the best possible initial assessment on which management decisions can be based.

Advantages

- Safe
- Inexpensive
- Rapid technique
- Accurate diagnosis
- Low risk of infections
- High index for suspicion for malignancy

Disadvantages

- Possibility of false negative results
- Site precision is very important
- FNB should never be considered a replacement for or the cause of delay in open biopsy when it is indicated

POINTS TO BE REMEMBERED ABOUT BIOPSY

- **Site of application of Local Anesthesia (LA) solution:** L.A should administered deeper in the tissue or area surrounding the biopsy site. Tissue artifacts may appear on microscopic examination if the L.A is given in the biopsy marked area.⁴
- **Incision planning:** All major vessels, nerves and other anatomical structures should be preserved while planning the incision. The incision should be of adequate depth to include the entire layer of epithelium and a significant portion of the underlying connective tissue.⁴
- **Surgical skill:** The biopsy specimen should be handled with great care. A technique sensitive procedure will help attain a minimal artifact biopsy that in turn prevents difficulty in diagnosing histopathologically. Intra operative artifacts may include pressing the sample with the tweezers, particularly if toothed, as may produce tissue tears and "pseudomicrocysts etc.
- **Specimen transportation:** While transporting the specimen to the histopathological laboratory, the specimen should be labeled properly with the patient's name, age, date of biopsy, and site of biopsy. The orientation of the specimen should be marked with the suture thread at different labels. the specimen should be delivered to pathologist immediately. Never put specimen on paper or in tubes with cotton plugs. cellulose fibers ruin microtome knives.⁶
- **Fixative:** The specimen should be transported in 10%

formalin. 70% ethanol can also be used. Isopropyl or methyl alcohol, saline or distilled water should never be used as it may cause cellular deformation.⁴

CONCLUSION

Treatment of premalignant, malignant, benign or systemic is largely dependent upon the accurate diagnosis. And the fact of the matter is that the histopathological diagnosis remains the gold standard for the diagnosis. Several methods and types of biopsies have been tried over the past. Each method has its own advantages and disadvantages. Therefore, the clinician must choose the type of biopsy method very wisely so as to reach the best diagnosis in shortest period of time.

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Lipid-peroxidation and Antioxidant Status in Osteoarthritis and Rheumatoid Arthritis Patients

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ABSTRACT

Introduction: Rheumatoid arthritis (RA) and Osteoarthritis is a chronic multisystem disease of unknown cause. The pathogenesis of this disease is due to the generation of ROS and RNS at the site of inflammation. Increased oxidative stress and decreased antioxidant status are the hallmark of these diseases. The objectives of the study was to evaluate the lipid-peroxidation level by measuring malondialdehyde, superoxide dismutase, ceruloplasmin and non - enzymatic antioxidant (Vitamin E and Vitamin C) status in patients of RA and OA and compare with normal individuals.

Material and Methods: In the present study we took 100 rheumatoid arthritis (RA), 100 osteoarthritis (OA) patients and 100 healthy individuals. Serum Lipid-peroxidation were measured by blood hemolysate by Uteley's method, Superoxide dismutase measured by Marklund's and Marklund's method, ascorbic acid by Carl A Burtis method and vitamin E by Emer Engle method and Ceruloplasmin by Ravin's method.

Result: In the present study we found increased lipid-peroxidation (MDA), Superoxide dismutase and Ceruloplasmin levels in both the study group as compared to control. Significantly decreased Vitamin E and Vitamin C levels found in both the study groups as compared to control.

Conclusion: The result shows increased oxidative stress in osteoarthritis and rheumatoid arthritis patient as compared to control. Present study indicates that osteoarthritis patients have higher oxidative stress which might be the result of increased extent of lipid peroxidation or due to decreased level of antioxidants.

Keywords: Lipid-peroxidation, Superoxide-dismutase, Ceruloplasmin, Oxidative Stress, Antioxidant

INTRODUCTION

Arthritis, the joint inflammation, refers to a group of diseases that cause pain, swelling, stiffness and loss of motion in the joints.¹ Osteoarthritis (OA) is one of the most prevalent and disabling chronic disease affecting the elderly. The current concept holds that Osteoarthritis involves the entire joint organ, including the subchondral bone, menisci, ligaments, periarticular muscle, capsule, and synovium² The etiology of knee OA is multifactorial. Excessive musculoskeletal loading, high body mass index, previous knee injury, female gender and muscle weakness are well-known factors.³ The imbalance between pro-oxidants and antioxidants gives rise to cellular oxidative stress, which plays an important role in the progression of OA.⁴ Free radicals and oxidants play a dual role, since they can be either harmful or helpful to the body. The process of free radicle formation plays a major part in the development of chronic and degenerative illness such as cancer, autoimmune disorders, aging, cataract, arthritis, cardiovascular and neurodegenerative diseases (Lien et al., 2008).⁵ Lipid- peroxidation mediated by free radical is considered to

be the major mechanism of cell membrane destruction and cell damage. Free radicals are formed in both physiological conditions in mammalian tissues.⁶ the uncontrolled production of free radicals is considered as an important factor in the tissue damage induced by several pathophysiology. Alteration in the oxidant- antioxidant profile known to occur in rheumatic diseases.

In the present study we evaluate the status of lipid-peroxidation, superoxide dismutase, Ceruloplasmin and non – enzymatic antioxidant (vitamin E and Vitamin C)

MATERIAL AND METHODS

The study was undertaken in the Department of Biochemistry, M.L.N. Medical College, Allahabad after taking the ethical approval from the institutional ethical board. All patients were clinically evaluated. Subjects were selected from the urban area of Allahabad after taking the written informed consent. Detailed history was taken including age, sex and presence of any risk factor.

The subjects were categorized into three groups.

Control group (age: 30-70 years): Normal healthy individuals they are free from any diseases and not any infection.

Study Group I (age: 30-70 years): In this category patient suffering osteoarthritis.

Study Group II (age: 30-70 years): In this category patient suffering rheumatoid arthritis.

Inclusion Criteria: The study population consisted of 100 osteoarthritis patients and 100 rheumatoid arthritis patients. The information on measurement like height, weight was collected from each subject. These subjects, having normal dietary habits without any supplements of vitamins to last six month. They were non alcoholic subjects.

Exclusion Criteria: In the present study the subjects were non alcoholics, non smokers and not suffering any diseases. These subjects were not taking any supplements. All patients were diagnosed as having RA and OA according to the American Rheumatism Association criteria of 1987⁷

The study was further proceeded by collecting blood samples of subjects of the above said groups and availing them for the determination of given parameters.

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The parameters mainly observed were oxidative stress marker (Lipid peroxidation), Ceruloplasmin, antioxidant enzyme (SOD), non-enzymatic antioxidants (Vitamin C and Vitamin E). Blood samples approximately 6ml were collected from the subjects and mixed with anticoagulant to avoid the clotting of blood samples. An aliquots (6ml) of blood sample was transferred to a centrifuge tube and kept at room temperature, plasma and packed cells were separated by centrifugation at 3000 rpm for 15 minutes. For the preparation of hemolysate the whole volume of packed cells was washed three times with cold saline water. One volume of packed cells was demolished with 1.8 volumes of cold distilled water and 0.2 volumes of cold saline water. If required, the plasma and hemolysate was refrigerated at 4°C. EDTA vials were used for the estimation of non-enzymatic antioxidant (Vitamin E and Vitamin C) by Emer-Engle method⁸ and Carl A Burtis⁹ method. Lipid-peroxidation was determined by Utley's method¹⁰ with the help of red cell hemolysate and Superoxide -dismutase by Marklund and Maklund¹¹ method and Ceruloplasmin by Ravin's Methods.¹²

STATISTICAL ANALYSIS

Mean \pm SD were used to express the data. Student t test was used for Statistical comparisons. The null hypothesis was rejected by $P < 0.05$.

RESULT

In the present study, Serum Lipid-peroxidation (MDA), Superoxide dismutase, Ceruloplasmin and non-enzymatic antioxidant (Vitamin E and C) levels were estimated (table-1, figure-1).

The serum MDA levels in the rheumatoid arthritis and

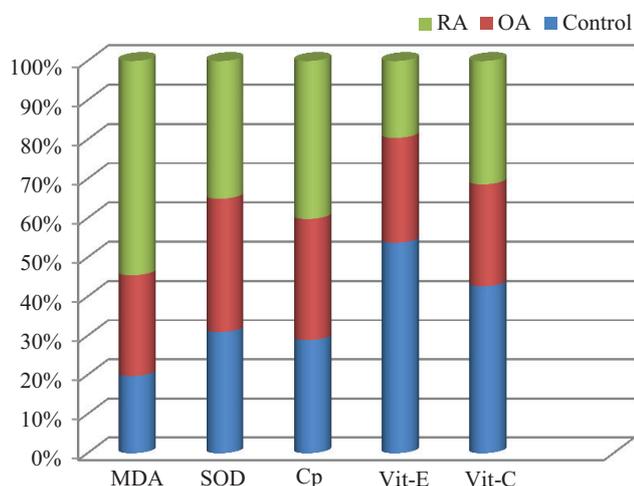


Figure-1: Levels of Lipid-peroxidation (MDA), Superoxide-dismutase (SOD), Ceruloplasmin (Cp), Vitamin E and Vitamin C in RA and OA patient compared to Control

osteoarthritis patient was 4.64 ± 0.229 and 2.19 ± 1.21 increased than that of controls (1.68 ± 0.994 nmol/ml, $P < 0.001$). Serum SOD levels in the rheumatoid arthritis patients and osteoarthritis patient was (2450 ± 40.1 and 2377 ± 38.5 unit/ml) which was increased in RA and OA patients than controls (2166 ± 145 , $P < 0.001$).

Serum Ceruloplasmin levels in the rheumatoid arthritis patients and osteoarthritis patient was (56.75 ± 19.5 and 43.65 ± 16.05 mg/dl) which was increased in RA and OA patients than controls (40.81 ± 11.35 , $P < 0.001$). Serum Vitamin E levels in the rheumatoid arthritis patients and osteoarthritis patient was (0.33 ± 0.02 and 0.45 ± 0.03 mg/dl) which was increased in RA and OA patients than controls (0.907 ± 0.25 , $P < 0.001$).

Serum Vitamin C levels in the rheumatoid arthritis patients and osteoarthritis patient was (0.64 ± 0.06 and 0.53 ± 0.07 mg/dl) which was increased in RA and OA patients than controls (0.87 ± 0.25 , $P < 0.001$). The levels of MDA, Superoxide-dismutase and Ceruloplasmin levels were significantly higher in both the study groups as compared to control subjects ($P < 0.001$). While non-enzymatic antioxidant (Vitamin E and Vitamin C) were significantly lower in RA patients than in control subjects ($P < 0.001$).

DISCUSSION

Rheumatoid arthritis is one of the most common inflammatory diseases worldwide. In the present study elevated levels of MDA and multidirectional antioxidant were native in both arthritic patients as compared to control. Oxygen free radicals have been implicated as mediators of tissue damage in patients of rheumatoid arthritis (RA).¹³ Osteoarthritis is an inflammatory disorder of the joint.¹⁴

Free radicals can be produced from non-enzymatic reactions of oxygen with organic compounds as well as those initiated by ionizing radiations. The non-enzymatic process can also occur during oxidative phosphorylation in the mitochondria. In the present study serum MDA was found significantly higher in RA and OA patient as compared to control. Our findings for lipid-peroxidation in both the study groups are similar to the study of Akyol et al.¹⁵ They reported elevated MDA levels in their study. In contrast of our study, Kajanachumpol et al.¹⁶ reported no significant changes in MDA levels in rheumatoid arthritis patients as compared to control.

The elevated MDA level in our OA patients coincide with result of Surapaneni et al.,¹⁷ Maneesh et al.,¹⁸ and Rubyk et al.,¹⁹ both are reported significantly elevated lipid peroxidation levels in their study these results are inconcordance of our study. This result shows elevated lipid-peroxidation is a important cause for arthritis.

According to Mezes et al.²⁰ and Ciemen MY et al.,²¹ SOD is the important antioxidant enzyme having an antitoxic effect against

S.N.	Particulars	Control (n=50)	RA Patients(n=50)	OA Patients (n=50)
1	Lipid-peroxidation	1.68 ± 0.994	4.64 ± 0.229	2.19 ± 1.21
2	Superoxide-dismutase	2166 ± 145	2450 ± 40.1	2377 ± 38.5
3	Ceruloplasmin	40.81 ± 11.35	56.75 ± 19.5	43.65 ± 16.05
4	Vitamin E	0.907 ± 0.25	0.33 ± 0.02	0.45 ± 0.03
5	Vitamin C	0.87 ± 0.25	0.64 ± 0.06	0.53 ± 0.07

Table-1: levels of Lipid-peroxidation, Superoxide-dismutase, Ceruloplasmin and Non-enzymatic antioxidant status in both the study groups compared to control groups

superoxide anion. The over expression of SOD might be an adaptive response and it result in increased in dismutation of superoxide to hydrogen peroxide.

Ostalowska et al²² have reported increased activities of superoxide dismutase in synovial fluid of patients with primary and secondary osteoarthritis of the knee joint.

Recklies et al²³ mentioned that SOD is the first line of defense against ROS; it catalythes the dismutation of the superoxide anion into hydrogen peroxide. Ceruloplasmin, Cu containing protein, has been found to be increased in RA patients as compared to control. Increased levels of Ceruloplasmin may be related to its scavenging action of superoxide radicals that are generated during the inflammatory process of RA.²⁴

Ceruloplasmin (Cp) is an acute phase protein that is primarily synthesized in the liver and secreted into the blood. It is a prominent antioxidant that can scavenge ROS.²⁵ We observed a significant increase in plasma Cp in OA patients was significantly higher than in control. In agreement with our findings, many authors²⁶ observed increased plasma Cp level in RA. On the other hand, Ashour et al.²⁷ stated that the raised levels of Cp are significantly increased in RA group but not in OA group. This outstanding agreement about Cp level in RA was emphasized by Nagler et al.²⁸ as Cp is considered the principal plasma and synovial antioxidant in RA, being responsible for up to 70% of the protective capacity against superoxide free radicals. Nevertheless, Louro et al.²⁹ stated that although the increase in the concentration of Cp might offer an additional safeguard against oxidative stress.

Significantly lower levels of Vitamin E and Vitamin C were found in RA patients as compared to control group. Vitamin E helps to trap free radicals and interrupt the chain reaction that damages the cells. As there is an increased oxidative stress in RA there may be increased consumption of Vitamin C and Vitamin E. This reduction in ascorbate levels suggests its role in combating oxidative stress.³⁰

Our findings inconcordance with the findings of Surapaneni KM et al.¹⁷ They observed significantly increased levels of erythrocyte SOD and significantly decreased Vitamin E and ascorbic acid levels in osteoarthritis patient as compared to control. The result suggest higher oxygen free radical production, evidence by increased SOD, increased MDA and decreased Vitamin E and Vitamin C activity, support to the oxidative stress in osteoarthritis. The increased activities of antioxidant enzymes may be a compensatory regulation in response to increased oxidative stress.

CONCLUSION

In the present study we observed elevated levels of lipid-peroxidation, superoxide-dismutase and extracellular antioxidant Ceruloplasmin in patient with osteoarthritis and rheumatoid arthritis as compared to control. Oxidative stress may be involved in rheumatoid arthritis and osteoarthritis.

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Demographic Distribution of Various Skin Diseases in Patients Visiting Tertiary Care Hospital in Saurashtra region, Gujarat, India

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ABSTRACT

Introduction: Pattern of skin diseases are influenced by various factors like genetic, race, religion, occupation, nutrition, habits etc. Thus, the present study was undertaken to assess the incidence of various dermatological disorders and demographic distribution among patients visiting tertiary care hospital in Saurashtra region of India.

Material and Methods: The present prospective study was carried out in Department of Pathology over 250 patients selected randomly visiting tertiary care hospital diagnosed with various skin lesions. Obtained data was arranged according to histopathological characteristics and was expressed as a number and percentage of respondents according to demographic details and were analyzed using the SPSS Version 17 software.

Results: Most of the patients of psoriasis were in age group of 41-60 years of age. Most common age group of lichen lesions were 21-40 years of age. Most common age of presentation in skin malignancies was above 40 years of age.

Conclusion: In psoriasis, males had predominance over females in a ratio of 2.25:1, in lichen lesions as 1.8:1, in verruca vulgaris ratio of 1:1.17 and in pemphigus vulgaris as 1.75:1. In pemphigus foliaceus, almost equal distribution was observed among males and females. Among the patients with infiltrative histopathology, squamous cell carcinoma was more common in males, while basal cell carcinoma was more common in females.

Keywords: Dermatology; demographic features; Psoriasis; Skin malignancy

INTRODUCTION

Pattern of dermatological disorders are affected by various factors such as genetic, race, religion, occupation, nutrition, habits etc. In addition to this, geographical factors like season and climate also influences the occurrence of increased prevalence of certain type of skin disorder in a particular area.¹ Moreover, the overcrowding and poor standards of hygiene are important factors determining the distribution of skin diseases in developing countries. The pattern of skin diseases also varies from country to country and in various regions within the same country.²

Gender differences in anatomy, physiology, as well as in epidemiology and manifestations of various diseases are well documented in literature. Regarding skin disorders, males are more commonly afflicted with infectious diseases whereas women are more vulnerable to psychosomatic disorders, autoimmune, pigmentary as well as allergic diseases.³ Thus, the present study was undertaken to assess the incidence of various dermatological disorders and demographic distribution among patients visiting tertiary care hospital in Saurashtra region.

MATERIAL AND METHODS

The present prospective study was carried out in Department of Pathology over 250 patients selected randomly visiting tertiary care hospital diagnosed with various skin lesions. Informed

consent was taken from the patients. Ethical clearance was obtained before the commencement of the study. Detailed demographic details along with clinical history was taken. Biopsy samples were taken biopsy from lesion along with surrounding normal areas and the specimen was preserved in 10% formalin subsequently dehydration, clearing, embedding in paraffin wax were carried out. Blocks were made, sections of 3micromtr thickness were cut and stained with Harris Haematoxylin and Eosin stain. The sections were histopathologically evaluated under light microscope for the confirmation of the diagnosis. Obtained data was arranged according to histopathological characteristics and was expressed as a number and percentage of respondents according to demographic details and were analyzed using the SPSS Version 17 software.

RESULTS

Demographic distribution of disease pattern:

Diseases confined to superficial subcutaneous units

Among the specimen collected, the frequency of disease confined to superficial subcutaneous units was more common in 21-40 years of age group. On studying demographic distribution in following histopathological subclasses, maximum number of patients were having psoriasiform lesions and maximum patients of psoriasis were in age group of 41-60 years of age while that of lichen planus were in 21-40 years of age and maximum number of patients of pseudoepitheliomatous hyperplasia presented in age group of 41-60 years of age. The age wise disease distribution of diseases based on histopathological characteristics has been mentioned belowneath in Table-1.

In the subcategory, equal disease distribution was observed between males and females. On further evaluation it was found that psoriasiform lesions had predilection for male sex in the ratio of male to female affection of 1.88:1. Likewise lichenoid lesions also had predilection for male sex affecting 13 males versus only 8 females as illustrated in Table-2.

Disease with localised superficial epidermal proliferation

Among this subcategory of disease with localised superficial epidermal proliferation, it was found to be more common in 41-60 years of age group. In the disease subtype on the further

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Sr no.	Histopathological characteristic	Disease subtype	Age distribution (In years)			
			0-20	21-40	41-60	>61
1	Spongiotic changes	Acute spongiotic dermatitis	0	0	1	0
		Sub-Acute spongiotic dermatitis	0	2	1	1
		Chronic spongiotic dermatitis	0	3	2	0
2	Eczematous lesions	Eczema	1	0	2	1
		Disseminated eczema	0	0	2	0
		Hypertrophic eczema	0	0	1	0
		Palmoplantar eczema	0	0	1	0
		Chronic actinic dermatitis	0	0	1	0
		Atopic dermatitis	0	1	0	1
3	Psoriasiform lesions	Psoriasis	1	9	15	1
		Pityriasisrosea	1	0	0	0
		Psoriatic erythroderma	1	0	0	0
4	Lichenoid infiltration	Lichen planus	1	11	4	1
		Hypertrophic LP	1	0	1	0
		Hyperplastic LP	0	1	0	0
		Lichen planopilaris	0	1	0	0
5	Atrophic epidermis	DLE	0	0	2	1
		SLE	0	3	0	0
6	Irregular epidermis	Pseudoepitheliomatous hyperplasia	1	3	5	1
		Actinic keratosis	0	0	1	0
		Keratoacanthoma	0	0	0	1
Total			7	34	39	8

Table-1: Distribution of diseases according to age confined to superficial subcutaneous units

Sr No.	Histopatho-logical characteristic	Disease subtype	No. of males	No. of females
1	Spongiotic changes	Acute spongiotic dermatitis	0	1
		Sub-Acute spongiotic dermatitis	0	4
		Chronic spongiotic dermatitis	1	4
2	Eczematous lesions	Eczema	2	2
		Disseminated eczema	0	2
		Hypertrophic eczema	0	1
		Palmoplantar eczema	0	1
		Chronic actinic dermatitis	1	0
		Atopic dermatitis	2	0
3	Psoriasiform lesions	Psoriasis	18	8
		Pityriasisrosea	0	1
		Psoriatic erythroderma	0	1
4	Lichenoid infiltration	Lichen planus	11	6
		Hypertrophic LP	2	0
		Hyperplastic LP	0	1
		Lichen planopilaris	0	1
5	Atrophic epidermis	DLE	0	3
		SLE	0	3
6	Irregular epidermis	Pseudoepitheliomatous hyperplasia	6	4
		Actinic keratosis	1	0
		Keratoacanthoma	0	1
Total			44	44

Table-2: Distribution of diseases according to gender confined to superficial subcutaneous units

evaluation, it was found that both squamous cell carcinoma and basal cell carcinoma is more common in more than 40 years of age group. In the verruca vulgaris disease subtype the disease was more common in 41-60 years of age group as shown in Table-3.

On evaluating sex distribution of this histopathological subcategory, it was observed that this subcategory has slight female predominance having 51 females and 44 males. Among disease subtypes, basal cell carcinoma had female predominance

with male to female ratio of 1:2 while squamous cell carcinoma had male predominance with male to female ratio of 1.77:1 as shown in Table-4.

Diseases with vesiculobullous lesions

Among the collected specimens, on observation it was found that vesiculobullous lesion was almost equally distributed in the 21-40 (n=8) and 41-60 (n=10) years of age group. Pemphigus vulgaris disease had equal disease distribution among 21-40, 41-60 and more than 60 years of age group. Pemphigus foliaceus

was comparatively more common among 41-60 years of age group as shown in Table-5

Vesiculobullous disease has equal sex predilection. Pemphigus vulgaris has slight predilection for males with male to female ratio of 1.75:1 as illustrated in Table-6.

Miscellaneous disease

The age distribution among the infectious and miscellaneous group of diseases identified on epidermal histopathological characteristics is shown underneath. With the histopathological finding of epidermal thinning and clinical diagnosis of leprosy, it is observed that it was slightly commoner in age group of 21-40 and 41-60 years as shown in Table-7 given below.

In this disease subcategory, leprosy has male predominance with male to female ratio of 2:1 as total 22 males and 11 females were affected.

DISCUSSION

Among the patients with infiltrative histopathology, Squamous

cell carcinoma was more common in males (n=16), while basal cell carcinoma was more common in females (n=18). Basal cell carcinoma had female predominance over males in a ratio of 2:1. Squamous cell carcinoma had male predominance over females in a ratio of 1.77:1. Squamous cell carcinoma was more common in males (n=16), while basal cell carcinoma was more common in females (n=18). Present study was in concordance with study by Laishram RS et al⁴ regarding age distribution, sex predilection of basal cell carcinoma and squamous cell carcinoma.

Among patients with verruca vulgaris (n=27), 13 were males and 14 were females with male to female ratio of 1:1.17. The disease is more common in the 41-60 years of age group (n=13/27, 46%) with 3 patients in 0-20 years age group, 6 patients in 21-40 years age group and 5 patients were in more than 60 years of age group. Present showed discordance with study by Rao SKM et al⁵ regarding age and sex predilection for verruca vulgaris.

Among psoriasisiform lesions, it was found that psoriasis was

Sr no.	Histopatho-Logical characteristic	Disease Subtype	Age distribution (In years)			
			0-20	21-40	41-60	>61
1	Papillomatous lesions	Verruca vulgaris	3	6	13	5
		Verruca plana	1	1	1	0
		Molluscumcontagiosum	1	1	0	0
		Condylomaaccuminata	0	0	1	0
2	Irregularly thickened epidermis	Seborrheic keratosis	0	1	2	1
3	Epidermal proliferation in to dermis	Squamous cell carcinoma	0	3	12	10
		Basal cell carcinoma	0	0	14	13
		Verrucous carcinoma	0	1	1	1
4	Elongated rete ridges	Naevus	1	0	0	0
		Lentigo simplex	0	1	0	0
5	Thinning of epidermis	Porokeratosis	0	1	0	0
Total			6	15	44	30

Table-3: Distribution of diseases according to age with localised superficial epidermal proliferation

Sr no.	Histopatho-Logical characteristic	Disease subtype	No. of males	No. of females
1	Papillomatous lesions	Verruca vulgaris	13	14
		Verruca plana	0	3
		Molluscumcontagiosum	1	1
		Condylomaaccuminata	1	0
2	Irregularly thickened epidermis	Seborrheic keratosis	2	2
3	Epidermal proliferation in to dermis	Squamous cell carcinoma	16	9
		Basal cell carcinoma	9	18
		Verrucous carcinoma	1	2
4	Elongated rete ridges	Naevus	0	1
		Lentigo simplex	0	1
5	Thinning of epidermis	Porokeratosis	1	0
Total			44	51

Table-4: Distribution of diseases according to gender with localised superficial epidermal proliferation

Sr No.	Histopathological characteristic	Disease subtype	Age distribution (In years)			
			0-20	21-40	41-60	>61
1	Subcorneal blisters	Pemphigus foliaceus	0	1	5	1
2	Intraspinous blisters	Darier's disease	0	1	0	0
		Herpes simplex	0	1	0	0
3	Suprabasal blisters	Pemphigus vulgaris	1	3	4	3
		Grover's disease	0	1	0	0
4	Subepidermal blisters	Bullous pemphigoid	0	1	1	3
Total			1	8	10	7

Table-5: Distribution of diseases with vesiculobullous lesions according to age

Sr No.	Histopathological Characteristic	Disease Subtype	No. of males	No. of females
1	Subcorneal blisters	Pemphigus foliaceus	3	4
2	Intraspinous blisters	Darier's disease	1	0
		Herpes simplex	0	1
3	Suprabasal blisters	Pemphigus vulgaris	7	4
		Grover's disease	1	0
4	Subepidermal blisters	Bullous pemphigoid	1	4
Total			13	13

Table-6: Distribution of diseases according to gender with bullous lesions

Sr no	Miscellaneous disease	Age distribution (in years)			
		0-20	21-40	41-60	>61
1	Leprosy	2	15	13	3
2	Lupus vulgaris	0	0	1	0
3	Keratopilaris	2	0	0	0
4	Fibrokeratoma	0	0	1	0
5	Kyrel's disease	0	0	0	1
6	Sebaceous carcinoma	0	0	0	1
7	Prurigo simplex	0	0	1	0
8	Erythema multiforme	0	0	1	0
Total		4	15	17	5

Table-7: Distribution of miscellaneous diseases according to age

Sr no	Miscellaneous disease	No. Of males	No. Of females
1	Leprosy	22	11
2	Lupus vulgaris	1	0
3	Keratopilaris	1	1
4	Fibrokeratoma	0	1
5	Kyrel's disease	0	1
6	Sebaceous carcinoma	0	1
7	Prurigo simplex	1	0
8	Erythema multiforme	1	0
Total		26	15

Table-8: Distribution of miscellaneous diseases according to gender

most common in 41-60 years of age group (n=15/26), with 18 males and 8 females patients, having male to female ratio of 2:1. Same way lichen planus was more common in the 21-40 years of age group (n=11/17) with 11 male and 6 female patients. Present study was compared with study conducted by Asokan N et al,⁶ and by Bedi TR et al,⁷ and it showed concordance with gender predilection with both the studies. Present study was in concordance with study of Ireddy SG et al⁸ regarding most common age presentation of lichenplanus.

Pemphigus vulgaris was almost equally distributed among the age group 21-40 (n=3, 27%), 41-60 (n=4, 36%) and more than 60 years of age (n=3, 27%). While pemphigus foliaceus was more common in 41-60 years of age group (n=5, 71.43%). Bullous pemphigoid was more common in more than 60 years age group (n=3, 60%). Pemphigus vulgaris was more common in males (n=7) than in females (n=4). While both pemphigus foliaceus and bullous pemphigoid is more common in females than in males. In pemphigus vulgaris category, present study showed concordance with study by AryaSR et al⁹ regarding age distribution.

Findings of present study of Pemphigus foliaceus suggest slightly higher prevalence in females than males. This was in

concordance with the findings of study conducted by DeeptiSP et al¹⁰ and Arya SR et al.⁹

Among the miscellaneous category with histopathological finding of epidermal thinning, leprosy was the most common diagnosis made (n=33, 13.2%). It is distributed more commonly in the 21-40 years (n=15) and 41-60 years (n=13) of age group. Total 22 males and 11 females were affected by this disease.

Other than environmental factors, pattern of skin diseases also varies according to socio-economic status and occupation of the patients, as people from low socio-economic group usually present with infective and allergic disorders whereas maid-servants usually affected with candidiasis, paronychia and hand eczemas.¹¹

Gender differences also exist in the occurrence and prognosis of certain skin malignancies which may be attributed to effect of sex hormones and differences in the skin structure and physiology. A more research directed towards gender differences in human health and diseases will lead to the development of novel concepts for prevention, diagnosis and management of dermatological diseases.³

CONCLUSION

The present study found that most of the patients of psoriasis were in age group of 41-60 years of age and patients of lichen lesions were 21-40 years of age. In psoriasis, males had predominance over females in a ratio of 2.25:1. In lichen lesions, males had predominance over females in a ratio of 1.8:1. In pemphigus vulgaris, males had predominance over females in a ratio of 1.75:1. In pemphigus foliaceus, almost equal distribution was observed among males and females. Among the patients with infiltrative histopathology, squamous cell carcinoma was more common in males (n=16), while basal cell carcinoma was more common in females (n=18).

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Profile of Endoscopic Ultrasound Guided Fine-Needle Aspiration Cytology (EUS-FNAC) in the Gastrointestinal and Peri-intestinal Lesions

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ABSTRACT

Introduction: Endoscopic ultrasound (EUS) is a sensitive technique for preoperative staging of gastrointestinal tumors. In view of this, the present study was commenced with objective of to study the spectrum of diagnosis made after EUS-FNAC, diagnostic utility and to assess the impact of diagnoses on patient management.

Material and Methods: The present cross sectional descriptive study conducted over 44 patients who underwent EUS guided FNAC of gastrointestinal and peri-intestinal lesions, by using 25 gauge needle detected on CT or USG. Obtained data was arranged according to microscopic diagnosis and was expressed as a percentage of respondents according to demographic details and were analyzed using the SPSS Version 17 software.

Results: Total of 44 patients, underwent EUS guided FNAC of gastrointestinal and peri-intestinal lesions, detected on CT or USG, out of which 36 cases were diagnosed and 8 cases remained undiagnosed on EUS guided FNAC 37 % cases reported neoplastic behaviour.

Conclusion: EUS-guided needle biopsy is a safe and efficient method, provides better visualization of small lesion that may be missed by CT or Trans abdominal USG and permits early diagnosis, detects unresectable disease, prevents unnecessary surgical exploration and reduces cost of care significantly.

Keywords: Endoscopic Ultrasound, Fine-Needle Aspiration Cytology, Gastrointestinal, Peri-intestinal

INTRODUCTION

Endoscopic ultrasound (EUS) is a sensitive technique for preoperative staging of gastrointestinal tumors.¹ High-frequency ultrasound and the close proximity of the transducer provides high-resolution images of the structures and thus, can detect small lesions that are discriminated with difficulty by computed tomography (CT). Thus, it is pure imaging modality with attachment of ultrasound probes to endoscopes due to which it improves visualization of the gastrointestinal wall and abdominal organs.²

The first EUS-FNA for cytologic diagnosis of a pancreatic lesion was performed by Peter Vilman in 1991 and published in 1992. His thesis which is considered a landmark study was published as a book on EUS using curved linear array transducer with description and development of the biopsy needle and the EUS-FNA procedure.³ EUS-FNA is commonly used to sample peri-intestinal structures (lymph nodes and masses in the pancreas, liver, adrenal gland, bile duct, kidney, lung, etc).⁴ In view of this, the present study was commenced with objective of to study the spectrum of diagnosis made after EUS-FNAC, diagnostic utility and to assess the impact of diagnoses on patient management.

MATERIAL AND METHODS

The present cross sectional descriptive study was carried out in the department of pathology, Jagjivan Ram Hospital (Western Railway), Mumbai from July 2011 to December 2015. Total of 44 patients of either gender underwent EUS guided FNAC of gastrointestinal and peri-intestinal lesions, by using 25 gauge needle detected on CT or USG. Informed consent was taken from the enrolled patients and ethical clearance was obtained. Sample adequacy on-site was assessed by Romanowsky stains. Fixation and staining of the smears for diagnostic purposes was carried by PAP and May-Grunwald-Giemsa (MGG) stain. Obtained data was arranged according to microscopic diagnosis and was expressed as a percentage of respondents according to demographic details and were analyzed using the SPSS Version 17 software.

RESULTS

Total of 44 patients, 24 (54.54%) male and 20 (45.45%) female, mean age of 44 years (10 to 78 years), underwent EUS guided FNAC of gastrointestinal and peri-intestinal lesions, detected on CT or USG, out of which 36 cases were diagnosed and 8 cases remained undiagnosed on EUS guided FNAC 37 % cases reported neoplastic behaviour. Table-1 show microscopic diagnosis of EUS guided FNAC of gastrointestinal and peri-intestinal lesions (Figure 1 to 12).

DISCUSSION

Endoscopic ultrasound-guided fine needle aspiration (EUS-FNA) has now been incorporated into the diagnostic and staging algorithm for the evaluation of benign and malignant diseases of the gastrointestinal (GI) tract and of adjacent organs. Introduced in the early 1980s from a pure imaging modality into a more interventional and lately therapeutic procedure.⁵ Vilman P et al⁶ revealed that endoscopic ultrasound examination of the upper gastrointestinal tract using a curved-array transducer will provide more significant diagnostic information of clinical

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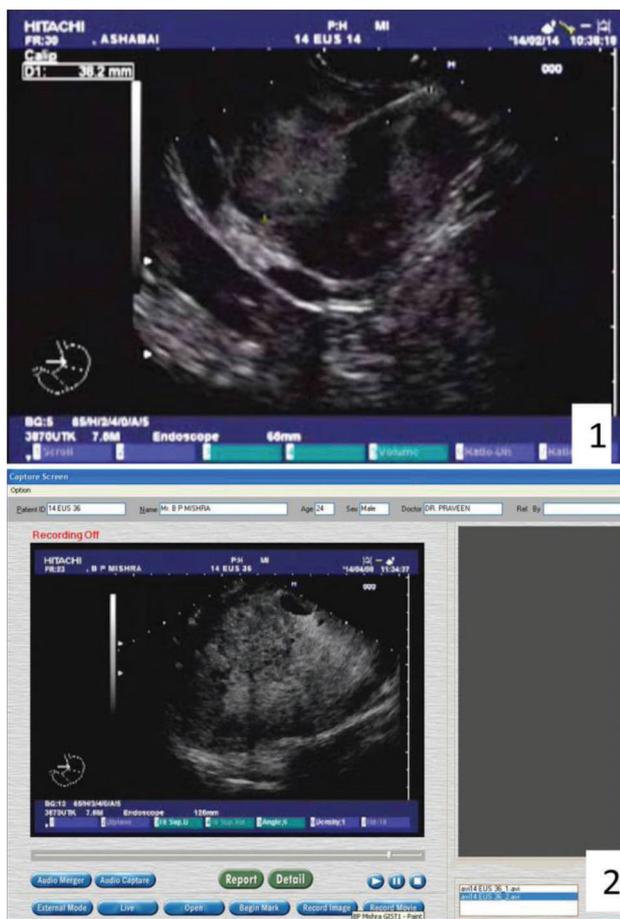


Figure 1 and 2: Endoscopic ultrasound findings

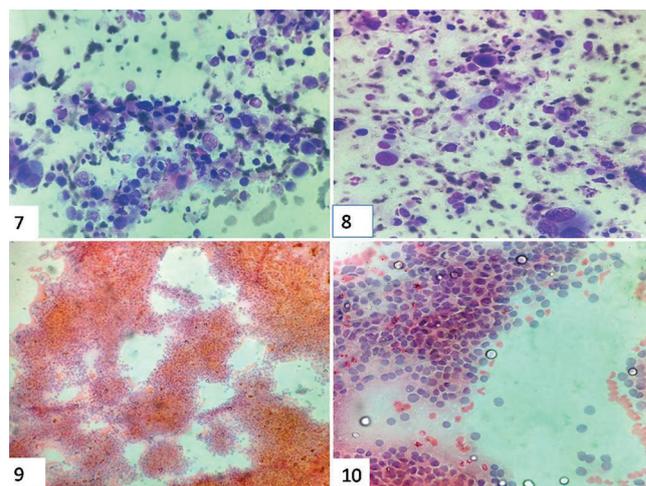


Figure-7: Adeno carcinoma of Pancreas 40X PAP, Figure-8: Adeno carcinoma of Pancreas 40X PAP, Figure-9: carcinoid of pancreas 10X PAP stain, Figure-10: carcinoid of pancreas 40X PAP stain

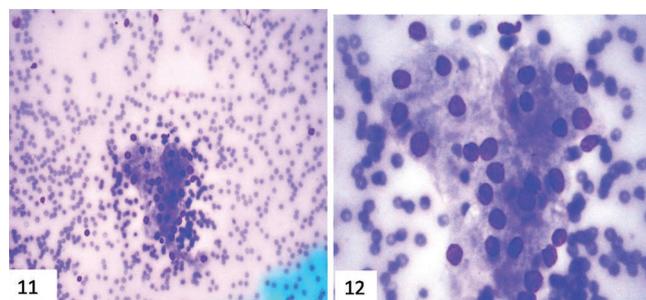


Figure-11: Pseudopapillary tumour of pancreas 10X PAP, Figure-12: Pseudopapillary tumour of pancreas 40X PAP.jpg

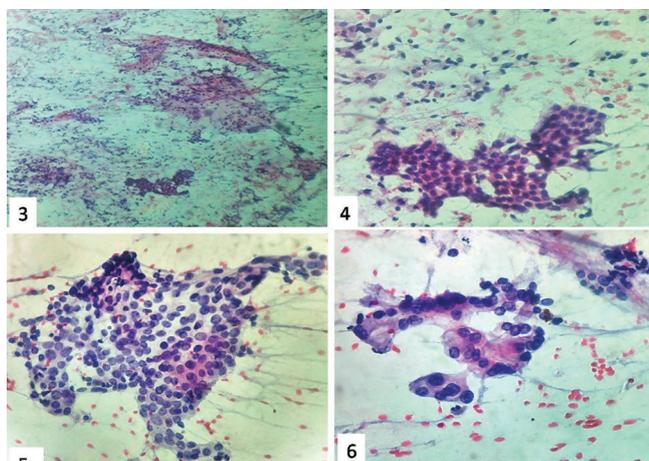


Figure-3: Chronic Pancreatitis 10X (PAP stain); Figure-4: Chronic Pancreatitis 40X (PAP Stain), Figure-5: Adeno carcinoma of Pancreas 40X PAP, Figure-6: Adeno carcinoma of Pancreas 40X PAP

relevance to gastroenterology.

Endoscopic ultrasound-guided fine-needle aspiration (EUS-FNA), has been spread as a good diagnostic tool for gastrointestinal and perigastrointestinal lesions,⁷ as it offers the possibility of collecting samples, providing a definitive cytological and/or histological evidence of the presence of malignancy, has strongly contributed to changing EUS from a subjective, highly operator dependant procedure into a more objective one.⁵

The present study reported that, 36 cases were diagnosed and 8 cases remained undiagnosed on EUS guided FNAC with

Microscopic Diagnosis	% EUS cases
Negative for malignancy	18%
Non Diagnostic	18%
Reactive Lymphadenitis	11%
Benign Inflammatory Lesion	5%
Carcinoid	5%
Chronic Necrotising Granulomatous Lymphadenitis	5%
Chronic Pancreatitis	5%
Cystic Neoplasm of Pancreas	5%
Malignant Epithelial Tumour of Pancreas	28%

Table-1: Distribution of microscopic diagnosis of EUS guided FNAC of gastrointestinal and peri-intestinal lesions

37 % cases reported neoplastic behaviour. Hunerbein M et al¹ investigated the role of EUS-guided biopsy in the evaluation of peri-intestinal tumors and reported that ultrasonography guidance of the biopsy needle enabled precise tissue sampling even of small lesions with a diameter of 1 cm. Raddaoui E et al⁸ determined the utility of EUS-guided FNA cytology in the diagnosis of deeply seated gastric mass lesions and reported that EUS-FNA cytology, when combined with a histologic assessment of cell blocks provides accurate and efficient tissue diagnosis of a wide variety of deeply seated gastric mass lesions. Iglesias-Garcia J et al⁹ evaluated the feasibility; safety and diagnostic yield of this newly developed slim echoendoscope for performing EUS-guided FNA/FNB and reported that EUS-FNB was feasible in 85 cases (97.7%), diagnostic yield was

86.21% (95%CI 77.4-91.9) in the intention-to-treat analysis and 88.24% (95%CI 79.7- 93.5) in per-protocol analysis and reported no complications related to the technique.

Endoscopic ultrasound-guided fine needle aspiration (EUS-FNA) also lowers the risk of peritoneal seeding from pancreatic cancer as compared with percutaneous FNA.¹⁰ The application of CT-guided percutaneous FNA in GI tract lesions, in general, has been limited in spite of the use of this technique in other organs such as the pancreas, liver, kidney, and other organs. Recently, EUS-guided FNA has been proved to be an efficient tool in the evaluation of deeply seated, unreachable GI lesions. EUS-FNA is cost-effective, less invasive, and highly sensitive and specific. It can be used both for diagnosis and staging purposes of various upper GI diseases.⁸

The early and accurate diagnosis of these rare lesions affects the patient management and facilitates the possibility of optimal surgical resection, which may reduce the number of nonresectable or metastatic cases.⁸ The factors that should be taken into consideration to achieve good specimens includes selection of needle size, necessity of stylet and suction, number of strokes and passes as well as presence of the on-site cytopathologist.¹¹

CONCLUSION

EUS-guided needle biopsy is a safe and efficient method for tissue sampling of peri-intestinal lesions. This minimally invasive technique provides adequate biopsies and thus, improves the diagnostic value of endoscopic ultrasonography. It provides better visualization of small lesion that may be missed by CT or Trans abdominal USG and permits early diagnosis and plays role as neoadjuvant chemotherapy. It is a safe procedure, that detects unresectable disease, prevents unnecessary surgical exploration and reduces cost of care significantly.

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Radiographic Evaluation of Skeletal Maturity using Maxillary Canine and Mandibular Second Molar Calcification Stages in Western Maharashtra Population- A Retrospective Study

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ABSTRACT

Introduction: Assessment of skeletal maturity and dental development is a common clinical practice in orthodontics. Timing of the orthodontic growth modification therapy is typically linked with the individual's peak of skeletal maturity. No additional exposure to radiation would be necessary if skeletal maturity can be assessed through routinely taken panoramic radiographs.

Material and Methods: OPG and Hand-wrist radiographs of 114 children between 9 and 16 years of age were obtained from records of patients attending Dental Hospital, Maharashtra. Time- period for retrospective study between years 2012 to 2014. Demirjian method was used to estimate the dental age through assessment of different calcification stages of maxillary canine and Mandibular second molar. Skeletal stage was determined using Julian singer method by using hand-wrist radiographs.

Results: Paired T-test revealed no significant difference between mean dental and skeletal age. Tendency toward late skeletal maturation and early dental maturation was observed. Spearman rank order test showed high correlation between skeletal maturity markers and dental maturity markers of maxillary canine ($r = 0.7386$) and mandibular second molar ($r = 0.6109$).

Conclusion: Calcification stages of Maxillary canine and Mandibular second molar, there will be more chance for males than females to be within peak stages, this is because the maximum growth spurt in female occurs at earlier age than male.

Keywords: Orthopantomography (OPG), Demirjian Method (Dental Age), Hand Wrist, Julian Singer Method (Skeletal Maturation).

INTRODUCTION

Growth and development of children is considered to be most important for orthodontist for age prediction which is known to vary between populations and can alter treatment planning. Physiologic age is the estimation of the actual rate of skeletal and somatic growth determined by the degree of maturation of different body parts.¹

Chronological age is not more commonly use as skeletal maturity identification. In growing individual, orthodontic treatment depends on skeletal growth.²

To detect skeletal growth routinely hand-wrist radiograph should be taken which is a supplemental diagnostic aid apart from essential diagnostic radiographs such intra oral periapical radiographs, OPG, and lateral cephalogram. Several other markers have been investigated for their ability to estimate the overall physiological maturity of the individual. For that skeletal maturity indicators, correlat with chronological age is considered acceptable.^{3,4}

Generally, the dental development can be assessed by either the phase of tooth eruption or the stage of tooth calcification, with

the latter being more reliable.

The ability to assess skeletal maturity by the developmental stage of the dentition through the examination of an OPG offers several advantages over the conventional hand-wrist radiographic method. In Orthodontic treatment most commonly using Orthopantomography than hand wrist radiograph. To reduce radiation exposer with children and skeletal maturity identification, several investigators have evaluated the association between dental maturity and chronological age in different populations.

The relationship between skeletal maturity and the calcification of teeth for Indian children has not been established. Also the detection of skeletal growth of an individual through calcification stages of maxillary canine and mandibular second molar is not yet established. There is limited information in literature regarding skeletal growth assessment by using OPG. Hence in this study an attempt was made to fill the lacunae regarding the skeletal growth assessment by using OPG in children from Karad city.

MATERIAL AND METHODS

Pretreatment OPG and Hand-wrist radiographs of 114 subjects [57 girls and 57 boys] were obtained from the records of patients who were seeking orthodontic treatment in Dental Hospital, karad.

OPG and Hand-wrist radiographs were graded according the Demirjian's tooth calcification stage and Julian Singer Hand-wrist radiograph stage. Radiographic assessments of dental and skeletal maturity was performed simultaneously using an illuminated viewing box in a dark room by trained oral radiologist. A single examiner performing dental and skeletal maturation assessment using OPG and hand-wrist radiographs.

The study protocol was reviewed and approved by the institutional ethical committee. The Inclusion criteria constitute: (1) children with normal growth and development within the age group of 9 and 16 years, (2) children with intermediate or

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late mixed, or early permanent phases of dentition. Children suffering from serious illness and systemic diseases were excluded from the study.

OPG and Hand-wrist radiograph were taken in single panoramic X ray a machine at the same time for each subject by keeping all the exposure parameters constant.

METHODS

OPG and Hand -wrist radiograph of each individual was taken with a universal counter balancing type of cephalostat at the Dental Hospital, karad. Only in present study subject who takes Orthodontic treatment in Dental Hospital. Kodak' x-ray films used with a tube to film distance of 6 feet. Hand wrist radiograph taken with fingers slightly separated.

Any patients who presented congenital or acquired abnormalities of the phalanges were eliminated and interpretation of all radiographs were undertaken without referring to clinical data of age of patient.

Radiographic interpretation of this study was made through Julian Singer method for skeletal maturity indication and Demirjian method for tooth calcification stages indicator.

Calcification stage of Maxillary canine and Mandibular second molar are classified according to Demirjian method which include 8 stages of tooth calcification [A to H]. Hand- wrist radiograph were classified according to Julian Singer method divided into 6 stages [stage 1-6]. Both methods are commonly used because of their simplicity, popularity and reliability. OPGs were chosen for dental maturity assessment, as they are routinely available in orthodontic clinics, and the mandibular region is clearly visible.

Assessment of individual dental maturity

Assessment of dental maturity was carried out through the calcification stages, according to Demirjian method(Stages D to H), in the OPG of the maxillary canine and mandibular second molar:

Stage D: Crown formation is complete down to the cemento-enamel junction and the beginning of root formation is seen, in the form of a spicule.

Stage E: Larger than that in the previous stage and the root length is less than the crown height.

Stage F: The root length is equal to or greater than the crown height.

Stage G: Apical end is still partially open.

Stage H: The apical end of the root canal is completely closed.

After assignment of a calcification stage for maxillary canine and mandibular second molar, stages were converted to scores through a conversion table, and then a score was calculated for each subject.

Assessment of individual skeletal maturity

Julian Singer method for skeletal maturity identification in Hand-wrist radiograph. these stages are defined as:

Stage 1 (Early): Epiphysis of proximal phalanx of second finger being narrower than its diaphysis.

Stage 2 (prepubertal): Epiphysis of proximal phalanx of second finger is equal to its diaphysis in width.

Stage 3 (pubertal onset): Increased width of epiphysis of

proximal phalanx of the second finger.

Stage 4 (pubertal): Capping of the diaphysis of the middle phalanx of third finger by its epiphysis.

Stage 5 (pubertal deceleration): Fusion of epiphysis of distal phalanx of third finger with its shaft. Epiphyses of radius and ulna not fully fused with respective shafts.

Stage 6: Fusion of epiphysis of radius and ulna with respective shafts.

STATISTICAL ANALYSIS

In this study we have to use Spearman rank correlation because it is a non-parametric test that is used to measure the degree of association between two variables. Spearman rank correlation test does not assume any assumptions about the distribution of the data and is the appropriate correlation analysis when the variables are measured on a scale that is at least ordinal and scores on one variable must be monotonically related to the other variable.

RESULTS

Assessment of dental maturity was carried out through the calcification stages, according to Demirjian. Out of 57 boys, majority 44% of subjects shows stage E (Root formation has begun) at the age of 12 years, while in 57 girls, majority 33.33% of girl's shows stage G (Parallel root walls with open apices) at the age of 11 years. The Date of calcification is same for two teeth for particular period of growth and calcification stage advances in girl then boy at age between 11-12 years.

Table 1 and 2 Shows skeletal maturity according to Julian Singer Hand-wrist method in boys and girls. Correlation of maxillary canine root formation stage with hand wrist radiograph

54.38% of boys shows stage E (Root formation has begun) of maxillary canine same time, hand wrist radiograph shows stage 2(prepubertal), while 22.80% of girls shows stage G (Parallel root walls with open apices) of maxillary canine same time Hand wrist radiograph shows stage 3(pubertal onset), so we conclude that in boys stage E and in girls stage G shows peak stage of growth.

Table 3 and 4 shows correlation of mandibular second molar root formation stage with hand wrist radiograph in boys and girls.

42.10% boys shows stage E of mandibular second molar, same time hand wrist radiograph shows stage 2(prepubertal), while 22.80% girls stage E (root formation has begun) of mandibular second molar same time, Hand wrist radiograph shows stage 3 (pubertal onset).

DISCUSSION

The present radiographic study represents a basic investigation to establish the relationship of maxillary canine and mandibular second molar root formation to growth status in a sample of Indian children.⁵

Chronologic age conveys only a rough approximation of the maturational status of a person, hence dental and skeletal ages have been explored as maturity indicators since decades. Assessing maturational status, can have a considerable influence on diagnosis, treatment planning, and the eventual outcome of orthodontic treatment. Growth modulation procedures which bring about changes in the skeletal base such as use of extra oral orthopaedic forces or functional appliances are based on active

Maxillary canine root formation	Hand wrist radiographic finding				
	Skeletal maturity staging				Total
	2	3	4	5	
Boys					
D	1(1.7%)	0	0	0	1
E	31(54.38%) **	3(5.26%)	0	0	34
F	0	1(1.7%)	0	0	1
G	4(7.01%)	13(22.80%)*	0	1(1.7%)	18
H	0	2(3.50%)	1(1.7%)	0	3
					57 Boys

()percent distribution, **Highly significant; r = 0.8364; *considered significant at p- value <0.0001

Table-1: Shows skeletal maturity according to Julian Singer Hand-wrist method in boys

Maxillary canine root formation	Hand wrist radiographic finding				
	Skeletal maturity staging				Total
	2	3	4	5	
Girls					
D	1(1.7%)	2(3.50%)	3(5.26%)	7(12.28%)*	13
E	5(8.7%)	7(12.28%)*	1(1.7%)	1(1.7%)	14
F	1(1.7%)	2(3.50%)	0	0	3
G	1(1.7%)	13(22.80%) **	6(10.52%)	6(10.52%)	26
H	1(1.7%)	2(3.50%)	3(5.26%)	7(12.28%)*	13
					57 Girls

()percent distribution, **Highly significant; r = 0.8364; *considered significant at p- value <0.0001

Table-2: Shows skeletal maturity according to Julian Singer Hand-wrist method in girls.

Mandibular second molar root formation	Hand wrist radiographic finding				
	Skeletal maturity staging				Total
	2	3	4	5	
Boys					
D	8	0	0	0	8
E	24(42.10%) **	3(5.26%)	0	0	27
F	2(3.50%)	1(1.7%)	0	0	3
G	2(3.50%)	14(24.56%)*	0	1(1.7%)	17
H	0	1(1.7%)	1(1.7%)	0	2
					57 Boys

()percent distribution, **Highly significant; r = 0.8364; *considered significant at p- value <0.0001

Table-3: Correlation of mandibular second molar root formation stage with hand wrist radiograph in boys

Mandibular second molar root formation	Hand wrist radiographic finding				
	Skeletal maturity staging				Total
	2	3	4	5	
Girls					
D	2(3.50%)	1(1.7%)	0	0	3
E	4(7.01%)	13(22.80%) **	1(1.7%)	1(1.7%)	19
F	1(1.7%)	1(1.7%)	0	0	2(3.50%)
G	1(1.7%)	10(17.54%)*	7(12.28%)	9(15.89%)	27
H	0	0	2(3.50%)	4(7.01%)	6
					57 Girls

()percent distribution, **Highly significant; r = 0.8364; *considered significant at p- value <0.0001

Table-4: Correlation of mandibular second molar root formation stage with hand wrist radiograph in girls.

growth periods.⁶ This study help to determine growth potential in the adolescent patient with help of orthodontist and pedodontist. Because of individual variations on timing, duration and velocity of growth, skeletal age assessment is essential in formulating viable orthodontic treatment plans. Hand wrist radiograph most commonly used for skeletal maturity identification. To avoid taking an additional X-ray, however, some researchers have sought to relate maturation with dental and skeletal features.⁷ Very few studies have shown that there is an association between bone development and different stages of dental calcification;

therefore, the stages of dental calcification can be used as the first tool for diagnosis. Dental maturity assessment offers the advantage (over skeletal maturity indicator) of being a simple procedure that can be carried out on panoramic and intraoral radiographs that provide minimal irradiation to the patient and easy determination of the calcification stages of teeth. On this basis, few researchers have proposed dental maturation to be a clinically useful diagnostic aid for the identification of individual skeletal maturation stages.⁸ The Julian Singer method and Demirjian method seems to be highly practical for clinical use in skeletal age assessment and

tooth calcification assessment.

Mappes et al indicated that the predominant ethnic origin of the population, climate, nutrition, socioeconomic levels, and urbanization are causative factors of these racial variations. In normal child, the apex closure of Maxillary canine is completed by the age of 15 years, while Mandibular second molar extend up to 16 years.⁹

This makes the tooth more reliable as a maturity indicator since most children exhibit a period of active growth up to the age of 16-17 years, this is in agreement with the findings of Al-Bustani.^{5,10}

No significant difference between chronological age and skeletal age assessed by SMI, similar findings were reported by Ha'gg.¹¹ But This is also not in accordance with some of the previous studies by Divyashree et al and Sahin Salam et al.^{12,13,7} On comparing developmental stages of maxillary canine and mandibular 2nd molar in males and females, significant differences were found. Similar findings were reported by Hegde et al.^{14,12}

Male patients shows stage E at the age of 12 years, while many of female patient's shows stage G at the age of 11 years.

Calcification stage of Mandibular second molar there will be more chance for males than females to be within peak stages, this is because the maximum growth spurt in female occurs at earlier age than male, which turn to affect the skeletal maturation more than the dental development. Our study also shows same results.¹⁵

On comparing developmental stages of maxillary canine, In Female stage G of maxillary canine coincides with stage 3 of Hand wrist radiograph, while in Male stage E coincides with stage 2 of SMI (Table 1 and 2). These stages represent the peak of the pubertal growth spurt. This finding supports the suggestions of previous studies.

The present study revealed a highly significant association between the developmental stages of mandibular 2nd molar and SMI, stage E coincides with stage 3 of SMI in females and stage 2 in Males (Table 3 and 4).

In panoramic radiographs, tooth calcification stages clinically useful for skeletal maturity indicator at the period of pubertal growth.

The ability to accurately appraise skeletal maturity from maxillary canine and mandibular second molar calcification, without the need for additional radiographs, has the potential to improve orthodontic diagnostic and therapeutic decisions. The hand wrist radiograph should be seen as a complement, rather than a replacement, to other valid methods to evaluate a child's physical condition. The techniques simplicity and ease of use should encourage these methods as first level diagnostic tool to assess skeletal maturity. Therefore, it is practical to consider the relationship between dental and skeletal maturity when assessing age of an individual in the age group of 8-16 years. There are remarkable differences in the distribution of tooth calcification and mineralization phases between sexes. Girls usually begin and end their dental development earlier than boys. Clinically, these differences suggest the need to start orthodontic treatment earlier in girls than in boys.

CONCLUSION

Calcification stages of maxillary canine and mandibular second

molar can give a guide for the puberty period, in stage D all males and females are in pre peak stage, in stage E and F they are within pre-peak and peak stages with more male(54.38%) than female maturity. In stage G, males in peak stage, whereas about one third of females(22.80%) passed to post peak, in stage H, less than 10% of males passed to post peak, while 80% of females are within post peak stage.

The apex closure of Maxillary canine is completed by the age of 15 years, while Mandibular second molar extend up to 16 years.⁹ Calcification stages of this two teeth, there will be more chance for males than females to be with in peak stages, this is because the maximum growth spurt in female occurs at earlier age than male.

The findings of this study indicate that tooth calcification stages might be clinically used as skeletal maturity indicator at the period of pubertal growth.

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Evaluation of Epidermal Reaction Pattern and Assessment of Histopathological Findings of Various Skin Disorders

Shweta Sharma¹, Dhara P Trivedi², Ronak Vyas³

ABSTRACT

Introduction: Skin biopsy with histopathologic study may be indicated for any doubt in clinical judgment, be it diagnostic or therapeutic. The present study was undertaken to study histopathological changes in epidermis and epidermal reaction pattern of various skin disorders.

Material and Methods: The present study was carried out over 250 patients with various skin lesions. The clinical findings of patients were noted and histopathology reports were thoroughly evaluated to reach a confirmative diagnosis and thus epidermal pattern were studied. Each biopsy was subjected to systemic and critical interpretative assessment in sequence of epidermal changes or vacuolar changes etc.

Results: Among the disease restricted to the superficial cutaneous units, psoriasiform lesions (n=28, 31.8%) were most common, and lichenoid lesions were the second most common lesions (n=21, 23.8%). Among psoriasiform lesions, psoriasis was the most common lesion in the presenting group (n=26/28). Among lichenoid lesions lichen planus was the most common entity found (n=17/21). Most common epidermal pattern in basal cell carcinoma were peripheral palisading of basal cells, asymmetric proliferation of epidermis into dermis, and acanthosis. Most common epidermal pattern in squamous cell carcinoma were irregular proliferation of epidermis into dermis and irregular acanthosis.

Conclusion: Histopathology of skin biopsies is an important and mandatory method in the investigation of various skin diseases and together evaluation of clinical correlation microscopic appearance provide diagnostic information.

Keywords: Biopsy, Dermatology, Epidermis, Skin lesions

INTRODUCTION

Skin diseases differ in their appearance according to the pathogenesis of the disease as diseases in which there is an overproduction of epidermal cells or a disorganization of their differentiation often show scaling. Simple benign hyperplasia (overgrowth) of the epidermis such as is commonly seen in infantile eczema often appears as lichenification, a term used to describe a thickening of the epidermis in which the normal surface markings of the skin are greatly exaggerated. Chronic benign or malignant proliferative dermatoses involving the epidermis often have a rough warty surface caused by overproduction by the epidermal cells of keratin.¹

Skin biopsy with histopathologic study may be indicated for any doubt in clinical judgment, be it diagnostic or therapeutic. The histopathologic report not only clarifies or confirms diagnosis and helps in clinical or surgical management, but it can also be a determinant factor in the medical-patient relationship, with psychological impact on both parties, enhancing the physician

certainty about clinical diagnosis and the patient's trust in the management.² The present study was undertaken to study histopathological changes in epidermis and epidermal reaction pattern of various skin disorders.

MATERIAL AND METHODS

The present study (prospective) was carried out in Department of Pathology, at tertiary care hospital over 250 patients during the period from January 2014 to November 2015. Various skin lesions that comes in the histopathology section from Department of Dermatology, Government hospital in the form of biopsy material were studied and evaluated. Patients with relevant history and presenting features visiting dermatology outpatients/indoor patients were scrutinized for appropriate skin biopsies. These histopathology reports were thoroughly evaluated to reach a confirmative diagnosis and thus epidermal pattern were studied. The clinical findings of patients were noted, and after an informed consent biopsy was taken from lesion along with surrounding normal areas. In this process, biopsy site was cleaned and painted with antiseptic solution and adequate amount of material with normal skin was taken by a punch biopsy instrument. The specimen was preserved in 10% formalin subsequently dehydration, clearing, embedding in paraffin wax were carried out. Blocks were made, sections of 3micromtr thickness were cut and stained with Harris Haematoxylin and Eosin stain

Light microscopy technique was used for the diagnosis. Each biopsy was subjected to systemic and critical interpretative assessment in sequence of epidermal changes or vacuolar changes etc.

Department of Dermatology, Government hospital has contributed for the completion of this study by providing relevant patient information and clinical support.

STATISTICAL ANALYSIS

Microsoft excel 2007 was uses to make tables. Descriptive statistics were used to infer results.

RESULTS

After dividing the skin diseases, on the basis of their histopathological characteristics into four strata, the following

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findings were noted (table-1).

DISEASE STRATIFICATION

Diseases Confined To Superficial Cutaneous Lesion: Among 11 cases of eczematous lesions, eczema was seen in 4 cases and 2 cases showed disseminated eczema, 2 cases of atopic dermatitis and one each of hypertrophic eczema, palmoplantar eczema and chronic actinic dermatitis. Among 28 psoriasiform lesions, 26 were of psoriasis and one each of pityriasisrosea and psoriatic erythroderma. Among 21 cases of lichenoid infiltration, 17 cases were of lichen planus, 2 of hypertrophic lichen planus and one each of hyperplastic lichen planus and lichen planopilaris. Among 6 cases of atrophic epidermis 3 were each of DLE and SLE. Among 11 cases of irregular epidermis, 10 cases were of pseudoepitheliomatous hyperplasia (Figure-1) and one each of actinic keratosis and keratoacanthoma as shown in table-2.

Disease With Localised Superficial Epidermal Proliferation:

In this disease category; among 33 patients of papillomatous lesion category, 27 patients were of verruca vulgaris, 3 of verruca plana and 2 of molluscumcontagiosum and one was having condylomaacuminata. Four patients were having seborrheic keratosis with histopathological feature of irregularly thickened epidermis. Among 55 patients showing epidermal proliferation into dermis, 27 patients had basal cell carcinoma (Figure-2), 25 had squamous cell carcinoma (Figure-3) and three were having verrucous carcinoma. Two patients showed elongated rete ridges with diagnosis of lentigosimplex and naevus and the one

was having thinning of epidermis in form of porokeratosis as shown in table-3.

Diseases With Vesiculobullous Lesions: All 7 patients having subcorneal blisters were diagnosed to have pemphigus foliaceus. Of two patients having intraspinous blisters, one each had Darier's disease and herpes simplex. Among 12 patients having suprabasal blisters, 11 had pemphigus vulgaris (Figure-3) and one is having Grover's disease (Figure-4). Five patients with subepidermal blisters on histopathology showed bullous pemphigoidas illustrated in table-4.

MISCELLANEOUS

Among this category 33 patients had leprosy, two were having keratopilaris. One each was diagnosed with lupus vulgaris, fibrokeratoma, Kyrrel's disease, sebaceous carcinoma, prurigo simplex, erythema multiforme.

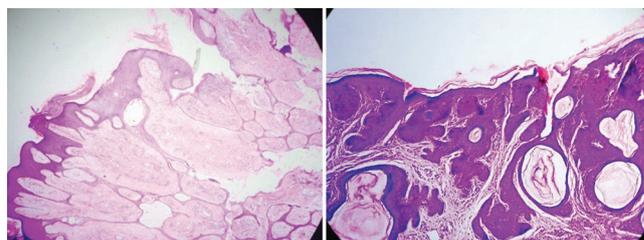


Figure-1: Photomicrograph of pseudoepitheliomatous hyperplasia (H and E stain 4x view); **Figure-2:** Photomicrograph of keratotic basal cell carcinoma (H and E stain 10 x view)

Histopathological classification	Number of patients (out of 250 patients)	Percentage (out of 250 patients)
Superficial Cutaneous Units	88	35.2%
Localized Superficial Epidermal Proliferations	95	38%
Vesiculobullous lesions	26	10.4%
Miscellaneous	41	16.4%
Total	250	100%

Table-1: Histopathological Findings

Sr no.	Histopathological Characteristic	Disease Subtype	Number of Patients	Total
1	Spongiotic Changes	Acute spongiotic dermatitis	1	10
		Sub-Acute spongiotic dermatitis	4	
		Chronic spongiotic dermatitis	5	
2	Eczematous Lesions	Eczema	4	11
		Disseminated eczema	2	
		Hypertrophic eczema	1	
		Palmoplantar eczema	1	
		Chronic actinic dermatitis	1	
		Atopic dermatitis	2	
3	Psoriasiform Lesions	Psoriasis	26	28
		Pityriasisrosea	1	
		Psoriatic erythroderma	1	
4	Lichenoid Infiltration	Lichen planus	17	21
		Hypertrophic LP	2	
		Hyperplastic LP	1	
		Lichen planopilaris	1	
5	Atrophic Epidermis	DLE	3	6
		SLE	3	
6	Irregular Epidermis	Pseudoepitheliomatous hyperplasia	10	12
		Actinic keratosis	1	
		Keratoacanthoma	1	
Total				88

Table-2: Disease confined to superficial cutaneous lesion:

Epidermal patterns

(1) Epidermal changes in psoriasis

Most common histopathologic findings in psoriasis seen in present study were acanthosis(84.6%), hyperkeratosis(76.9%), parakeratosis(69.2%) and psoriasiform hyperplasia(69.2%). Micromunroabscess(7.6%) was seen in few cases as illustrated in table-6.

2) Epidermal changes in lichen planus

All the cases showed orthokeratosis(100%). Wedge shaped hypergranulosis was seen in 88.2% cases. Irregular acanthosis was seen in 94.1% of cases. Max Joseph spaces or small areas of artifactual separation was apparent in 23% of cases as illustrated in table-7

(3) Epidermal changes in Pemphigus

Tomb stone appearance is seen in 81.8% of cases. Hyperkeratosis seen in 27.2 % of cases, while 90.9% of cases showed acanthosis and acanthocytes was observed in 81.8% of cases as illustrated in table-8.

Epidermal changes in Pemphigus foliaceus: Acanthosis and acanthocytes were seen in all the cases of pemphigus foliaceus

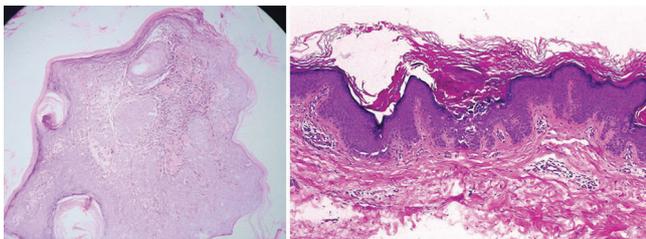


Figure-3: Photomicrograph of squamous cell carcinoma (H and E stain, 10x\ view); **Figure-4:** Photomicrograph of grover's disease (H and E stain 10x view

while dyskeratosis seen in 85.7% of cases as illustrated in table-8.

Epidermal changes in Basal cell carcinoma: All the cases of Basal cell carcinoma showed peripheral pallisading of basal cell layer, while 96.2% cases showed asymmetric proliferation of epidermis into dermis. Acanthosis was seen in 81.4% and atrophic epidermis accounted to less than 20% of cases as shown in table-9.

Epidermal changes in Squamous cell carcinoma: Almost all the cases of squamous cell carcinoma showed irregularly acanthosis while parakeratosis finding was observed in 80% cases (table-9).

DISCUSSION

After dividing the skin diseases, on the basis of their histopathological characteristics into four strata, the following findings were noted. Going with the individualized histopathological characteristics, among the disease restricted to the superficial cutaneous units, psoriasiform lesions (n=28, 31.8%) were most common, and lichenoid lesions were the second most common lesions (n=21, 23.8%). Among psoriasiform lesions, psoriasis was the most common lesion in the presenting group (n=26/28). Among lichenoid lesions lichen planus was the most common entity found (n=17/21). Present study was compared with study conducted by Asokan et al³, and by Bedi et al⁴, and it showed concordance with these studies in terms of psoriasis being the most common lesion among psoriasiform lesions. Similar findings of epidermal pattern were seen in a study commenced out by Karumbaiah KP et al⁵ in which majority of the lesions showed hyperkeratosis, parakeratosis, acanthosis while hypogranulosis and Munro micro abscess accounted to less than 30%of the cases.

Sr No.	Histopathological Characteristic	Disease Subtype	Number of Patients	Total
1	Papillomatous Lesions	Verruca vulgaris	27	33
		Verruca plana	3	
		Molluscumcontagiosum	2	
		Condylomaaccuminata	1	
2	Irregularly Thickened Epidermis	Seborrheic keratosis	4	4
3	Epidermal Proliferation In To Dermis	Squamous cell carcinoma	25	55
		Basal cell carcinoma	27	
		Verrucous carcinoma	3	
4	Elongated Rete Ridges	Naevus	1	2
		Lentigo simplex	1	
5	Thinning Of Epidermis	Porokeratosis	1	1
Total				95

Table-3: Disease with localised superficial epidermal proliferation

Sr no.	Histopathological Characteristic	Disease Subtype	Number of Patients	Total
1	Subcorneal Blisters	Pemphigus foliaceus	7	7
2	Intraspinous Blisters	Darier's disease	1	2
		Herpes simplex	1	
3	Suprabasal Blisters	Pemphigus vulgaris	11	12
		Grover's disease	1	
4	Subepidermal Blisters	Bullous pemphigoid	5	5
Total				26

Table-4: Disease with vesiculobullous lesions

Most of the characteristic histopathologic features of Lichen planus were seen with regularity in the present study. Most

Sr no	Infectious and Miscellaneous Disease	Number of Patients
1	Leprosy	33
2	Lupus Vulgaris	1
3	Keratopilaris	2
4	Fibrokeratoma	1
5	Kyrel's Disease	1
6	Sebaceous Carcinoma	1
7	Prurigo Simplex	1
8	Erythema Multiforme	1
Total		41

Table-5: Infectious and miscellaneous disease

Sr no	Histopathological Changes in Epidermis	No. of Cases (Out of 26)	Percentage (Out of 26)
1	Hyperkeratosis	20	76.9%
2	Parakeratosis	18	69.2%
3	Acanthosis	22	84.6%
4	Psoriasiform Hyperplasia	18	69.2%
5	Hypogranulosis	7	26.9%
6	Munromicro Abscess	2	7.6%

Table-6: Epidermal changes in psoriasis

Sr no	Histopathological Changes In Epidermis	No. of Cases (Out of 17)	Percentage (Out of 17)
1	Orthokeratosis	17	100%
2	Wedge shaped hypergranulosis	15	88.2%
3	Irregular acanthosis	16	94.1%
4	Max Joseph spaces	4	23%

Table-7: Epidermal changes in lichen planus

Epidermal changes in Pemphigus vulgaris			
Sr no	Histopathological Changes In Epidermis	No. of Cases (out of 11)	Percentage (out of 11)
1	Tombstone appearance	9	81.8%
2	Hyperkeratosis	3	27.2%
3	Acanthosis	10	90.9%
4	Acanthocytes	9	81.8%
Epidermal changes in Pemphigus foliaceus			
Sr no	Histopathological Changes In Epidermis	No. of Cases (Out of 7)	Percentage (Out of 7)
1	Acanthosis	7	100%
2	Dyskeratosis	6	85.7%
3	Acanthocytes	7	100%

Table-8: Epidermal changes in Pemphigus

Epidermal changes in Basal cell carcinoma			
Sr no	Histopathological Changes In Epidermis	No. of Cases (N=27)	Percentage (N=27)
1	Asymetric proliferation of epidermis into dermis	26	96.2%
2	Peripheral pallisading of basal layer	27	100%
3	Acanthosis	22	81.4%
4	Atrophic epidermis	5	18.5%
Epidermal changes in Squamous cell carcinoma			
Sr no	Histopathological Changes In Epidermis	No. of Cases(N=25)	Percentage (N=25)
1	Irregularly acanthosis	25	100%
2	Parakeratosis	20	80%

Table-9: Epidermal changes in Skin malignancy

commonly seen findings were orthokeratosis irregular acanthosis, wedge shaped hypergranulosis. These changes account for more than 90% of the cases. Max Joseph space is the least frequent finding present in only 30% of the cases. Present study was in concordance with study conducted by Ireddy SG et al⁶ regarding most common age presentation of lichen. The results of the present study also correlates with the findings of Parihar A et al.⁷

It is important to distinguish Lichen planus from other lichenoid dermatosis under microscope, as the treatment plan is different and they differ in prognosis also. A lichenoid xanthem triggered by a drug-induced reaction can mimic exanthematous Lichen planus. Lichen ruberularis may resemble morphea or erythemasannulare, and Lichen ruberlinearis may show similar resemblance to striated nevus or Lichen striatus. These may be differentiated on the basis of the typical predilection sites and the patient's medical history.⁸

Among the diseases with histopathological characteristics of localized superficial epidermal proliferation (n=95), the pattern of epidermal proliferation into dermis (n=55, 57.8%) comprising of patients with squamous cell carcinoma (n=25/55, 45.45%), basal cell carcinoma (n=27/55, 49%) and verrucous carcinoma (n=3/55, 5.45%) was most common followed by papillomatous lesions (n=33, 34.7%) characteristics, of which verruca vulgaris was most common (n=27/33, 81.8%).

Among the patients with infiltrative histopathology, basal cell carcinoma (n=27/55, 49%) was slightly more common than the squamous cell carcinoma (n=25/55, 45.4%). Both diseases showed predilection for patients aged more than 40 years. Most common epidermal pattern in basal cell carcinoma were peripheral pallisading of basal cells, asymmetric proliferation of epidermis into dermis, and acanthosis. Most common epidermal pattern in squamous cell carcinoma were irregular proliferation of epidermis into dermis and irregular acanthosis.

The Vesiculobullous skin diseases comprise a group of eruptions of widely different etiology and prognosis, which share a common characteristic, the formation of blister cavities with indifferent layers of the epidermis or beneath the epidermis.⁹ Of the 26 patients with vesiculobullous lesion, 11 (42%) had pemphigus vulgaris; followed in number by pemphigus foliaceus (n=7, 27%) and bullous pemphigoid (n=5, 19%). Pemphigus vulgaris was almost equally distributed among the age group 21-40 (n=3, 27%), 41-60 (n=4, 36%) and more than 60 years of age (n=3, 27%). While pemphigus foliaceus was more common in 41-60 years of age group (n=5, 71.43%). Bullous pemphigoid was more common in more than 60 years age group (n=3, 60%). The study showed concordance with study by Arya SR et al¹⁰ regarding age distribution.

Most characteristic findings observed in Pemphigus vulgaris were acanthosis and the appearance of keratinocytes and acanthocytes while least common finding was of hyperkeratosis. Findings of present study of Pemphigus foliaceus suggest slightly higher prevalence in females than males. This was in concordance with the findings of Deepti SP et al¹¹ and SR Arya et al.¹⁰

Among the miscellaneous category with histopathological finding of epidermal thinning, leprosy was the most common diagnosis made (n=33, 13.2%). It is distributed more commonly in the 21-40 years (n=15) and 41-60 years (n=13) of age group. Total 22 males and 11 females were affected by this disease.

Skin diseases often present a diagnostic dilemma and challenge for the pathologist. Knowledge of the clinical information, microanatomy of the skin, and the biological behaviour of various inflammatory dermatoses, in addition the use of a systematic approach during histological evaluation, are essential to narrow the differential diagnosis, thereby achieving the most accurate and appropriate diagnosis.¹²

CONCLUSION

In the present study, majority of the patients (n=95) showed histopathology characteristics of localized superficial epidermal proliferation accounting to 38% of total received biopsies. In the subunit of localized superficial epidermal proliferation majority (n=55/95) i.e. 57.8% patients showed epidermal proliferation into dermis suggestive of carcinomatous etiology, closely followed by papillomatous lesions (n=33/95 i.e. 34.7%). Most common epidermal pattern in basal cell carcinoma were peripheral palisading of basal cells, asymmetric proliferation of epidermis into dermis, and acanthosis. Most common epidermal pattern in squamous cell carcinoma were irregular proliferation of epidermis into dermis and irregular acanthosis. Histopathology of skin biopsies is an important and mandatory method in the investigation of various skin diseases and together evaluation of clinical correlation microscopic appearance provide diagnostic information.

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A Solitary Nevus Lipomatosus Cutaneus Superficialis: A Rare Case Report

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ABSTRACT

Introduction: Nevus Lipomatosus Cutaneus Superficialis (NLCS) is a rare benign hamartomatous condition characterized by the presence of ectopic adipose tissue in the dermis. It was first reported by Haffman and Zurhelle in 1921. Clinically, it is classified into two types, the classical- Hoffman-Zurhelle or the multiple form characterized by groups of multiple non-tender, soft, yellowish or skin colored plaques. The other form of NLCS clinically manifest as a solitary pedunculated nodule or sessile papule.

Case report: We report the case of solitary NLCS in 40 years old male presenting as a solitary, pedunculated, soft, non-tender mass measuring 4×3×1cm on the right elbow. Microscopy shows the reticular dermis containing lobules of ectopic fat separating the dermal collagen bundles which suggest the diagnosis of NLCS.

Conclusion: The physicians should be aware of this rare condition because early recognition enables more conservative resection of tumor and less invasive reconstruction of the defect.

Keywords: Nevus Lipomatosus Cutaneus Superficialis, adipocytes, hamartoma

INTRODUCTION

Nevus Lipomatosus Cutaneus Superficialis (NLCS) is an uncommon benign hamartomatous condition characterized by ectopic adipose tissue in the dermis.¹ There is no gender predilection or hereditary predisposition of this disease. Clinically it is classified into two forms. The classical form is characterized by groups of multiple non-tender, soft, pedunculated, yellowish or skin colored papules, nodules or plaques. Classical NLCS is mostly reported to involve the pelvic or gluteal region but can also rarely occur on the abdomen, chest and face.²

They are usually present at birth or emerge during the first two decades of life. It was first reported by Haffman and Zurhelle in 1921. The other form of NLCS manifests as a solitary dome shaped or sessile papule on the buttock and thigh.³ Unusual sites like scalp, axilla, knee, ear, eye, nose and clitoris can also be involved.¹ The solitary form presents after second decade of life. It is also known as pedunculated lipofibroma.⁴ In 1968, Weitzner reported a 24 year old Spanish-American male who presented with an asymmetric small, solitary nodule on the scalp and in which the biopsy was consistent with NLCS.^{1,2}

We report here a case of solitary form of NLCS occurring on the elbow.

CASE REPORT

A 40 years old man presented with a gradually increasing swelling on the right elbow since 3 months. On physical examination the swelling was solitary, pedunculated, non-tender, soft measuring 4×3×1cm.

The excision biopsy was submitted to the department of

pathology for histopathological examination.

Gross: Tissue mass of size 4×3×1cm with external surface covered with thick, wrinkled skin and cut surface whitish yellow. There was no ulceration, pigmentation and hair growth.

Microscopic examination: Hematoxylin and Eosin stained sections of the lesion revealed lining stratified squamous epithelium with flattened rete ridges. Both papillary as well as reticular dermis contain lobules of ectopic fat separating the dermal collagen bundles. The adipose tissue was not encapsulated and was mature. The ectopic fat had no connection with the underlying subcutaneous fat. Fat lobules were mainly localized around the blood vessels with sparse lymphocytic infiltrate. Dermal appendages were absent in the sections studied.

Based on clinical and histopathological features, a diagnosis of solitary NLCS was given.

DISCUSSION

NLCS was first described by Haffman and Zurhelle in 1921. NLCS is a relatively rare disease characterized by groups of ectopic fat cells in the papillary or reticular dermis. Two clinical forms have been identified. The multiple form or the classic form is characterized by multiple soft non-tender skin colored or yellow papules, nodules or plaques usually develop shortly after birth or during the first two decades of life.³⁻⁵

The classic form has a predilection for the gluteal, pelvic and lower back region.¹ The solitary form can present as a single pedunculated or dome shaped papule or nodule on the buttock and the thigh. Unusual sites like the scalp, axilla, knee, ear, eye, nose, clitoris and palm can also be involved.¹

The solitary form presents after the second decade of life. There is no gender predilection and patients are otherwise in good health.⁵ The main histological abnormality in either type of NLCS is ectopic fatty tissue in the upper dermis often not connected to the fat of the underlying subcutis.¹ The proportion of dermal fat is variable ranging from less than 10% of the dermis to over 50%.² In our case ectopic adipose tissue was mainly seen around dermal blood vessels.

Presumably fat cells in the dermis were the result of local heterotopic development of the adipose tissue. NLCS was presumed to be the result of displacement of subcutaneous

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Figure-1: Gross photograph showing solitary nodule with cerebriform surface



Figure-2: Gross photograph showing whitish yellow cut surface

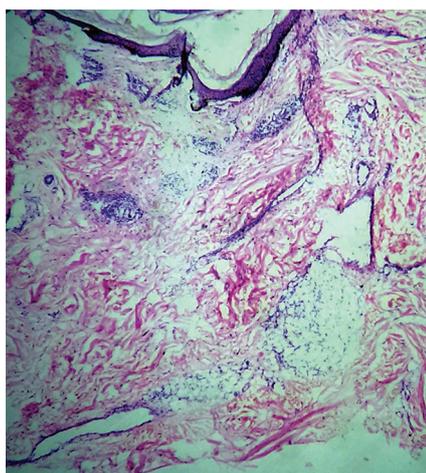


Figure-3: Ectopic adipose tissue in reticular dermis (H and E ×100)

adipose tissue embedded into the dermis. Recently electron microscopic findings strongly confirmed the perivascular origin of young adipocytes and the differentiation into mature fat.⁴ NLCS should be differentiated from nevus sebaceous, fibroepithelioma, nevocellular nevi, focal epidermal hypoplasia and the dermal variant of spindle cell lipoma. Nevus sebaceous contains skin appendages but no fat cells

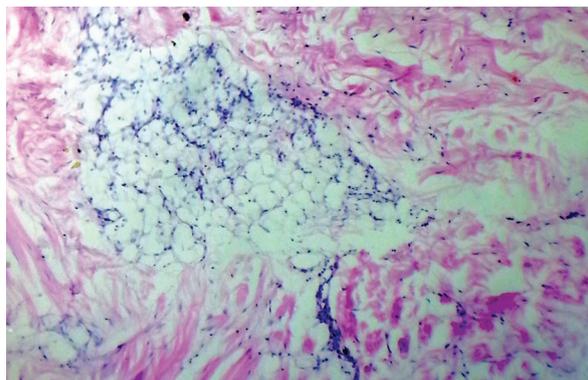


Figure-4: Scattered lobules of ectopic adipose tissue entrapped between bundles of dermal collagen fibers (H and E ×400)

in the dermis. The solitary form of NLCS has a broad base when compared to fibroepithelioma. Dermal collections of the adipocytes are also present in nevi however the presence of nevus cells sometimes occupying a small area of the lesion helps in differentiation.

Focal epidermal hypoplasia also has fat in the dermis along with extreme attenuation of collagen. The dermal variant of spindle cell lipoma contains more spindle shaped cells and fibromucinous stroma.¹

Another peculiar variant of this condition is marked by excessive, symmetric circumferential folds of skin with underlying NLCS and affect the neck, forearms, lower legs and resolve spontaneously during childhood. It has been described as Michelin tire baby syndrome. This syndrome is inherited as an autosomal dominant trait and is characterized by deletion of chromosome 11.⁵

For cosmetic purpose, surgical excision is the best choice of treatment.⁶

CONCLUSION

The physicians should be aware of this rare condition because early recognition enables more conservative resection of tumor and less invasive reconstruction of the defect.

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Minimally Invasive Periodontics - Need of the Hour!!

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ABSTRACT

Recent advances in dentistry promote the use of minimally invasive procedures. These techniques have evolved from magnification devices to advanced surgical instruments and modified procedures. Periodontal diseases are a heterogeneous group of diseases characterized by inflammation and the subsequent destruction of the tooth-supporting tissue. Conventional periodontal regenerative procedures involving large periodontal flaps for access are employed to improve short- and long-term clinical outcomes of periodontally compromised teeth. Conversely minimally invasive therapeutic approaches with minimized incisions and trauma to the soft tissue have proven to be advantageous over the conventional therapy. This article reviews various minimally invasive procedures and highlights the advantages of minimally invasive surgical and non-surgical therapy.

Keywords: Minimally Invasive Periodontal Surgery, periodontitis.

INTRODUCTION

Historically surgical techniques were governed by specific incisions and surgical principles. Until the mid-nineteenth century, surgical procedures were extremely brutal and ablative and had minimal application. The introduction of anaesthesia and improved surgical techniques enabled the surgeons to undertake complicated procedures; however minimal thought was given to the surgical trauma to the patient leading to numerous deaths. Scientific innovations and advances in technology led to the idea that surgeries could be performed more elegantly and less traumatically.¹ This realization gave rise to the concept of minimally invasive (MI) treatment with its primary goal to achieve a satisfactory therapeutic result with minimized trauma during any interventional process.²

MINIMALLY INVASIVE DENTISTRY

Oral cavity is affected primarily by caries and periodontal diseases. Minimally invasive caries management comprises of early detection, diagnosis, intercepting and treatment at a microscopic level.³ The earlier concept of "Extension for prevention" has shifted to new paradigm of "minimally invasive dentistry".

Tyas and Colleagues⁴ in 2000 gave the following concepts:

1. Early caries diagnosis
2. The classification of caries depth and progression using radiographs
3. The assessment of individual caries risk (high, moderate, low)
4. The reduction of cariogenic bacteria, to decrease the risk of further demineralization and cavitation
5. Arresting of active lesions
6. Remineralization and monitoring of non-cavitated arrested

lesions

7. Placement of restorations in teeth with cavitated lesions, using minimal cavity design
8. Repair rather than the replacement of defective restorations
9. Assessing disease management outcomes at pre-established intervals.

MINIMALLY INVASIVE PERIODONTICS

Periodontitis can be defined as the inflammation of the supporting tissues of the teeth usually a progressively destructive change leading to loss of bone and periodontal ligament.⁵ The ultimate goal of periodontal therapy is the regeneration of the lost periodontal tissues.⁶

Intra-bony defects have been previously treated using various membranes and bone grafts. Various clinical studies on barrier membranes (Nyman et al. 1982, Gottlow et al. 1986), demineralized freeze-dried bone allograft (DFDBA, Bowers et al. 1989), combination of barrier membranes and grafts (Camelo et al. 1998, Mellonig 2000) and Enamel Matrix Derivative (EMD, Mellonig 1999, Yukna and Mellonig 2000) demonstrated significant clinical attachment level gain and pocket probing depth reduction. However exposure of the regenerative material leading to contamination is a critical issue and hampers the clinical outcomes (Nowzari et al. 1995, De Sanctis et al. 1996). Since late 1980's, there has been a primary focus on the outline and execution of surgical procedures for periodontal regeneration. Utmost importance is given to preservation of soft tissue and to attain stable primary closure of the wound in order to prevent contamination from oral environment (Cortellini et al. 1995, 1999). In 1990, Wickham and Fitzpatrick described the techniques of using smaller incisions as "minimally invasive surgery". The concept of minimally invasive surgery was further refined by Hunter and Sackier in 1993 who described the surgical approach as "the ability to miniaturize our eyes and extend our hands to perform microscopic and macroscopic operations in places that could previously be reached only by large incisions".⁷ Tibbetts and Shanelec in 1994, 1998 described periodontal microsurgical instruments and technique. These techniques primarily concentrated on soft tissue regeneration and augmentation procedures using microsurgical instruments and improving visualization using a surgical operating microscope.⁸ In 1995, minimally invasive surgery (MIS) was

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introduced by Harrel and Ress, in order to minimize wounds and flap reflection. This concept also helps in handling hard and soft tissues gently during periodontal surgery. Isolated defects not extending beyond the interproximal site were considered ideal for this technique. Incisions were aimed at conserving the soft tissue as much as possible. In cases of multiple isolated defects, individual incisions for each site should be given. Tunnel Technique used for regenerative surgeries is an integral part of MIS.⁹

Though the concept of MIS was proposed and introduced earlier, it did not emphasize on the wound stability and closure. To lay more stress on wound and blood clot stability and primary wound closure for blood-clot protection, Cortellini and Tonetti proposed the Minimally Invasive Surgical Technique (MIST) in 2007. They later improvised it further by incorporating the concept of space provision for regeneration with the Modified Minimally Invasive Surgical Technique (M-MIST, Cortellini and Tonetti 2009) The use of operating microscopes, Surgical telescopes (loupes) and microsurgical instruments increased the surgical prognosis (Cortellini and Tonetti 2001, 2005). These instruments provided magnification and optimal illumination of the surgical field thereby improving the visual acuity. Improved control of surgical instruments under magnification resulted in reduced surgical trauma thereby leading to reduced flap reflection and better post-surgical healing.¹⁰

CLINICAL STUDIES AND OUTCOMES

The application of minimally invasive surgical approaches has been reported in Tables 1 and 2.

NON-SURGICAL PERIODONTAL THERAPY

Dental endoscope is an imaging device which aids in accurate diagnosis and treatment of periodontal disease. It provides sub-

marginal gingival imaging to locate and evaluate the extent and nature of root deposits.¹⁹A preliminary study indicated that up to 95% of all root surfaces may be accessed for visualization with this instrument.²⁰

SURGICAL PERIODONTAL THERAPY

Minimally Invasive Surgical Technique (MIST, Cortellini and Tonetti 2007a, 2007b) focuses on the conservative elevation of both buccal and lingual flaps of the defect-associated interdental papilla. Depending upon the width of the interdental space, the papilla may be dissected either diagonally or horizontally. In cases of narrow interdental spaces a diagonal cut is selected, as described in the Simplified Papilla Preservation Flap (SPPF, Cortellini et al. 1999); conversely, in cases of wide interdental spaces, horizontal cut is performed as described in Modified Papilla Preservation Technique (MPPT, Cortellini et al. 1995a, 1995b).

MODIFIED PAPILLA PRESERVATION TECHNIQUE

Cortellini et al. modified the Papilla preservation technique described by Takei et al in 1984. This technique was introduced as a new approach for interproximal regenerative procedures called ‘the modified papilla preservation technique’. Application of this technique is limited to wide interdental spaces (2 mm). The main advantage of this technique includes primary closure of tissues and papilla preservation in 75% of cases. At the base of the defect associated buccal interdental papilla, a horizontal incision is made and a full-thickness palatal flap including the interdental papilla is elevated. A full-thickness buccal flap is elevated with vertical releasing incisions, when needed. A barrier membrane is placed to cover the defect. The membrane is completely covered by the repositioned interdental tissues

MIST	Type of study (quality of evidence)	Interventions	No. pax	No. defects	CAL gain	PD reduction	Recession
Cortellini and Tonetti ¹⁰	Case cohort (level 2)	MIST+EMD	13	13	4.8±1.9	4.8±1.8	0.1±0.9
Cortellini and Tonetti ¹¹	Case cohort (level 2)	MIST+EMD	40	40	4.9±1.7	5.2±1.7	0.4±0.7
Cortellini et al. ¹²	Case cohort (level 2)	MIST+EMD	20	44	4.4±1.4	4.6±1.3	0.2±0.6
Ribeiro et al. ¹³	RCT (Level 1)	MIST	15	15	2.82±1.19*	3.55±0.88*	0.54±0.58*
		MIST+EMD	14	14	3.02±1.94*	3.56±2.07*	0.46±0.87*
Ribeiro et al. ¹⁴	RCT (level 1)	MIST	14	14	2.85±1.19*	3.51±0.90*	0.48±0.51*
		MINST (RPL)	13	13	2.56±1.12*	3.13±0.67*	0.45±0.46

MINST, minimally invasive non-surgical technique (RPL with the aid of a microscope); MIST, minimally invasive surgical technique; EMD, emdogain, *No statistical difference

Table-1: Application of minimally invasive surgical approaches

M-MIST/SFA	Type of study	Interventions	No. pax	No. defects	CAL gain	PD reduction	Recession
Cortellini and Tonetti ¹⁵	Case cohort	M-MIST+EMD	15	15	4.5±1.4	4.6±1.5	0.07±0.3
Cortellini and Tonetti ¹⁶	RCT	M-MIST	15	15	4.1±1.4*	4.4±1.6*	0.3±0.6*
		M-MIST+EMD	15	15	4.1±1.2*	4.4±1.2*	0.3±0.5
		M-MIST+EMD+BioOss	15	15	3.7±1.3*	4.0±1.3*	0.3±0.7*
Trombelli et al. ¹⁷	RCT	SFA	12	12	4.4±1.5*	5.3±1.5*	0.8±0.8*
		SFA+HA+GTR	12	12	4.7±2.5*	5.3±2.4*	0.4±1.4*
Mishra et al. ¹⁸	RCT	M-MIST	12	12	2.6±0.8*	3.8±0.9*	0.5±0.5*
		M-MIST+rhPDGF-BB	12	12	3.0±0.9*	4.2±0.6*	0.8±0.6*

M-MIST, modified minimally invasive surgical technique; SFA, single flap approach; rhPDGF-BB, recombinant human platelet derived growth factor, *No statistical difference

Table-2: Application of minimally invasive surgical approaches

and sutured.²¹

SIMPLIFIED PAPILLA PRESERVATION FLAP

The SPFF is applicable in narrow interdental spaces (< 2 mm). An oblique incision across the defect-associated papilla, from the gingival margin at the buccal line angle of the involved tooth to the mid-interproximal portion of the papilla under the contact point of the adjacent tooth is given. A full-thickness palatal flap including the buccal papilla is elevated. A split-thickness buccal flap is elevated. Degranulation along with regenerative procedures is performed. The interdental tissues are replaced into their original position and sutured using single modified internal mattress suture to provide primary intention closure of the interdental papilla.²²

MODIFIED MINIMALLY INVASIVE TECHNIQUE

Cortellini and Tonetti in 2009 suggested a Modified Minimally Invasive Surgical Technique (M-MIST). The primary aim was to provide a minimal access to the defect only from the buccal side. This technique is initiated with minimal elevation of a triangular buccal flap to expose the residual crestal bone. The palatal flap is not elevated. All clinical steps are performed through the small buccal “surgical window”. The granulation tissue is carefully dissected and separated from the underlying supra-crestal interdental fibres without causing any trauma to them. After removing the granulation tissue, the roots are scaled and planed. The buccal flap is placed back into its original position and sutured using a modified internal mattress suture. This helps to achieve primary closure. This technique has certain limitations and disadvantages. It cannot be employed in cases with complex and wide defects involving 3 or 4 surfaces of a tooth. Larger flaps have to be elevated in cases where the defect extends to the apical third or apex of the root.¹⁵

VIDEOSCOPE ASSISTED MINIMALLY INVASIVE SURGERY (V-MIS)

The term Videoscope assisted minimally invasive surgery (V-MIS) is used to describe MIS performed with the aid of a videoscope. Proper visualization of the surgical site is of utmost importance in MIS. Hence a videoscope comprising of a small digital camera was developed. This camera when placed at the surgical site provides direct visualization and greater magnification (Harrel et al. 2012, 2013). Harrel SK et al in 2014²³ conducted a study to evaluate residual defects following non-surgical therapy consisting of root planing with local anaesthetic. V-MIS was performed utilizing the videoscope for surgical visualization. Re-evaluation, 6 months post-surgery, showed statistically significant improvement ($p < .001$) in mean PPD and CAL (PPD 3.88 ± 1.02 mm, CAL 4.04 ± 1.38 mm) in 1, 2, and 3 wall defects. All PPD at re-evaluation were 3 mm or less. There was a mean post-surgical increase in soft tissue height (0.13 ± 0.61 mm, $p = 0.168$) with a decrease in recession.

ROBOT-ASSISTED MINIMALLY INVASIVE SURGERY (RMIS)

Robot-assisted minimally invasive surgery (RMIS) promises to be a revolutionary step towards refining MIS. It would greatly improve the accuracy and dexterity of a surgeon while minimizing trauma to the patient. Robotically assisted

minimally invasive surgery uses end-effectors and manipulators of the robotic arms to perform the actual surgery on the patient. These arms can either be controlled by a telemanipulator or through computer control.

In the telemanipulator approach, the surgeon performs the normal movements associated with the surgery while the robotic arms replicate them onto the patient. The computer controlled approach allows the surgeon to use a computer to control the robotic arms.²⁴ However; clinical studies using RMIS have shown only marginal success. A major disadvantage includes large size footprints and cumbersome robotic arms. Due to feasibility constraints, long term studies using RMIS have not been conducted.²⁵

CONCLUSION

The goal of periodontal surgery has always been to alleviate or eliminate the degeneration associated with progressive periodontal disease and to regenerate lost tissues. Introduction of Minimally invasive surgery highlights various advantages such as less invasive surgery, shorter duration, favoured healing due to improved wound stability of minimally mobilized flaps, and benefiting the patient with reduced intra-operative and postoperative morbidity. The future promises further evolution towards a more primary preventive approach, facilitated by emerging technologies for diagnosis, prevention and treatment. However there are technical, cultural and economic obstacles to overcome for this to be fully realized in clinical practice.

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Malnutrition and Associated Factors among underfive in a Nigeria Local Government Area

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ABSTRACT

Introduction: Malnutrition remains a public health problem in developing countries like Nigeria. Understanding the factors associated with malnutrition is important in tackling the problem. Objective: The aim of this study was to determine the prevalence of malnutrition and associated factors among under-five children in Borgu Local government area of Niger state, Nigeria.

Material and Methods: A descriptive design was adopted. The study involved 250 children drawn using multi-stage sampling. Data was collected using questionnaire, weighing scale and a length board. Data was analyzed using chi-squared and descriptive statistics. Stunting, underweight and wasting were determine using the WHO child growth standards.

Result: Findings indicate that prevalence of stunting, wasting and underweight was 47.6%, 8.8% and 25.6% respectively. About 18% were diagnosed with various forms of protein energy malnutrition and is most common among male children (23.2%), younger children (31.8%) (Between 0-11 months) and children of mothers with no formal education (25.2%). Marasmus was the most common form of protein energy malnutrition (63.6%).

Conclusion: Malnutrition is a problem in this setting. Age of child, gender, and maternal educational status have influence on malnutrition.

Keywords: Prevalence, Malnutrition, Stunting, Wasting, Underweight, Protein energy malnutrition, Under-five, Borgu, Nigeria.

child feeding practices was important risk factors to severe underweight in children in developing countries.⁷ In Nigeria, a 10 year retrospective study in south east revealed that male children are more likely to be malnourished than female. Similarly, Yalew⁸ posited that sex of children is connected to malnutrition and prevalence of stunting was high among boys compared with girls. Similarly, a study in Uganda shows that male children are at increased risk of stunting.⁹ Yalew⁸ further shows that mothers with no formal education were 4 times more than mothers who had completed more than primary education to have stunted children. A study in Maiduguri, Nigeria asserted that 80% of malnourished children were from low socioeconomic status.¹⁰ Lack of education especially among women is a strong determinant of malnutrition among children.² The current national demographic and health survey in Nigeria shows that stunting is most common among children of less educated mothers (50%) and those from the poorest households (54%).³

Age of child is associated with malnutrition.⁶ Marasmus was more common in children between 6-12 months (57.7%) in south east Nigeria.⁴ In Uganda, children aged between 3-24 months are at increase risks of suffering from acute malnutrition.⁹

Regional estimates of nutritional indices are usually not a reflection of the local estimate, hence, this study determine nutritional status of a selected population of under five children in Borgu Local Government. This study will not only guide future studies, it will also provide a base line data for the local government. This will assist in planning nutritional support programs in the future.

MATERIAL AND METHODS

This was a descriptive study involving 250 children from Borgu local government area of Niger state. Participants were selected using multi-stage sampling. A questionnaire was used in data collection. The weight of all children was measured using a weighing scale while length (for children below two) and height (for children between 2 and 5 years) was measured using a length board while lying down and standing up, respectively. Observation for oedema, emaciation, sunken eyes, dehydrated skin, tin grey hair and protruding abdomen was done. Stunting, underweight and wasting were determine using

INTRODUCTION

Malnutrition in children is an important public health issue especially for developing countries like Nigeria. Weight-for-height, height-for-age and weight-for-age are three important parameters for assessing nutritional status in children.¹ Malnutrition is estimated to contribute directly or indirectly to more than 33% of all child deaths globally.² Wasting implies that children are too thin for height, stunting indicates that children are too short for age while underweight means children are too thin for age.³

Wasting is usually below 5% in poor countries and prevalence of stunting is between 5%-65% (WHO, 2016). According to the recent National Demographic and Health Survey (NDHS) in Nigeria, 37% of children under-five are stunted, 18% are wasted and 29% are underweight (NDHS, 2014). In south east Nigeria, marasmus is the most common form of protein energy malnutrition (PEM).⁴ The prevalence of stunting, wasting and underweight among under five in Anambra state (South eastern Nigeria) were 15.1%, 18.1% and 10.4% respectively.⁵ A study in India reported that prevalence of underweight, stunting, and wasting is 60.4%, 55.4% and 43% respectively⁶ and is an indication of acute malnutrition in that population.

Several factors have been associated with malnutrition. Parental education, economic and nutritional characteristics,

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the WHO child growth standards. PEM was classified using weight-for-age with or without edema. A child between 80-60% without oedema is considered underweight, 80-60% with oedema is kwashiorkor, and less than 60% with oedema is marasmic-kwashiorkor while less than 60% without edema is marasmus. Data was organized and analyzed using descriptive and inferential. Frequencies were calculated and presented in simple tables. Mean and standard deviation for age, height and weight was calculated.

Ethical clearance was obtained prior to the study. Informed consent was obtained from parents of children and was assured of anonymity and confidentiality of information obtained.

STATISTICAL ANALYSIS

Data were analyzed using Chi square statistical test. Microsoft excel 2007 was used to generate tables.

RESULTS

Table-1 indicates that 119 (47.6%) children were stunted, 64 (25.6%) underweight, while 22 (8.8%) were wasted.

Table-2 shows that the prevalence of protein energy malnutrition (PEM) in this population is 17.6%. Table-3 indicates that the frequencies of various protein energy malnutrition in the study population. Twenty-eight children representing 63.6% were marasmic, 6 (13.6%) had kwashiorkor, while 10 (22.7%) had marasmic-kwashiorkor.

Table-4 indicates that 26 (23.2%) of the 112 male children had PEM while 18 (13%) of the 138 female had PEM. The relationship between gender and PEM is statistically significant because the chi squared is greater than the critical value at significant level of 5%. The table further shows that 41 (19.7%) who were not exclusively breastfed had PEM while only 3 (7.1%) who were exclusively breastfed were diagnosed with PEM. The test statistic suggested that the relationship of breastfeeding practice with PEM is statistically not significant at 5% significant level.

The mean age, height and weight of children are 28 ± 13.6 months, 81.35 ± 17 cm and 10.04 ± 5.24 kg respectively.

Table-4 further shows that 14 (31.8%) of 44 children between the age of 0-11 months had some form of PEM. Nine (13.2%) 12-23 months had PEM. For 24-35, 36-47 and 48-59 months, number of children with PEM was 5(9.8%), 10(20.4%), and 6(15.8%) respectively. The relationship between child's age and PEM is statistically significant at 5% significant level. Twenty-seven (25.2%) of mothers who have no form of formal education had children with PEM. Six (7.8%) children to mother who had primary education had PEM. For mothers with secondary and tertiary education, 10 (21.7%) and 1 (5%) respectively had PEM.

The chi-squared analyses shows that the chi-squared values for relationships between malnutrition and age of baby, gender of baby and education of mother were higher than the critical values at significant level of 0.05. These suggest that the relationships are statistically significant. However, the relationship between malnutrition and infant feeding practices was not statistically significant at significant level of 0.05.

DISCUSSION

Childhood malnutrition persists as a public health problem in developing countries. It is estimated that less than 5% of

Indices	No of children	
Stunting	119	47.6
Underweight	64	25.6
Wasting	22	8.8
Not malnourished	45	18

Table-1: Distribution of children according to wasting, underweight and stunting.

Malnutrition	No of children	
Protein energy malnutrition	44	17.6
No protein energy malnutrition	206	82.4
Total	250	100

Table-2: Prevalence of Protein Energy Malnutrition

Type of Protein Energy Malnutrition	No of children	
Marasmus	28	63.6
Kwashiorkor	6	13.6
Marasmic-kwashiorkor	10	22.7
Total	44	100

Table-3: Types of PEM

Variables	Children with PEM	Children without PEM	
Gender			
Male	26 (23.2%)	86 (76.8%)	112
Female	18 (13%)	120 (87%)	138
Total	44	206	250
Chi-square = 4.42, critical value = 3.84, significant level = 0.05, degree of freedom =1			
Breastfeeding practice			
Exclusive breastfeeding	3 (7.1%)	39 (92.9%)	42
Mixed feeding	41 (19.7%)	167 (80.3%)	208
Total	44	206	250
Chi-square = 3.82, critical value = 3.4, significant level = 0.05, degree of freedom =1			
Age in months			
0-11	14 (31.8%)	30 (68.2%)	44
12-23	9 (13.2%)	59 (86.8%)	68
24-35	5 (9.8%)	46 (90.2%)	51
36-47	10 (20.4%)	39 (79.6%)	49
48-59	6 (15.8%)	32 (84.2%)	38
Total	44	206	250
Chi-square = 9.68, critical value = 9.49, significant level = 0.05, degree of freedom =4			
Education status of Mothers			
No formal education	27 (25.2%)	80 (74.8%)	107
Primary education	6 (7.8%)	71 (92.2%)	77
Secondary education	10 (21.7%)	36 (78.3%)	46
Tertiary education	1 (5%)	19 (95%)	20
Total	44	206	250
Chi-square = 12.22, critical value = 7.81, significant level = 0.05, degree of freedom =3			

Table-4: Cross tabulation of prevalence of PEM against gender, breastfeeding practices, child's age and educational status of mother.

children in developing nations are wasted.¹ The prevalence of wasting in the current study is a little above this estimate. The current study indicates that 47.6% of the study population was

stunted and this falls within the WHO estimate for developing countries.¹ The prevalence of underweight, stunting, and wasting from this study is lower than what was reported by Manjunath et al.⁶ It is also consistent with the estimate from the 2013 national demographic and health survey³, except for stunting. Stunting in this population is higher than the national estimate. Stunting and underweight in the current study is also higher than the prevalence in south eastern Nigeria. However, the prevalence of wasting reported by Ezeama et al⁵ (18.1%) from south eastern Nigeria is higher than prevalence in the study population (8.8%). Government of Borgu should sustain and scale up existing interventions that will reduce malnutrition. Prevalence of PEM is 17.6%. The commonest form of PEM is marasmus (63.6%). This is consistent with the assertion of Ubesie et al⁴ and is an indication that acute malnutrition is a problem in this setting.

Several factors are associated with PEM and vary from place to place. The prevalence of PEM among male children is higher than in female children and the relationship between PEM and gender is statistically significant. This finding is similar to the position of Ubesie et al⁴, Olwedo et al⁹ and Yalew.⁸ This underlines the need to give special attention to mothers of male children when counseling women about the nutrition of their children.

Exclusive breastfeeding for six months is beneficial for both infant and mother. The prevalence of PEM among children who were exclusively breastfed was low when compared with those not exclusively breastfed. It is unfortunate that the relationship between exclusive breastfeeding and PEM is not statistically significant. Increase advocacy for exclusive breastfeeding could reduce the prevalence of PEM in this setting.

Age of the child can determine the prevalence of malnutrition. The prevalence of malnutrition was highest among children between the ages of 0 and 11 months (31.8%). This is consistent with the positions of Ubesie et al⁴ and Olwedo et al.⁹ Age is a significant determinant of malnutrition in the current study area. Parents of younger children will need additional support in preventing malnutrition.

Maternal education is also a strong determinant of malnutrition. The chi square test suggested a significant relationship ($P=0.05$). The prevalence of PEM was highest among mothers who had no formal education (25.2%). This aligns with the opinion of (Hamidu et al¹⁰, Brain et al², and Yalew.⁸ It is also consistent with the report of the 2013 national demographic and health survey in which 50% of stunting was reported among children whose mothers were less educated. Formulating policies that will encourage education of women could reduce child malnutrition in this setting and in developing countries in general. Government can achieve this by making basic education free for women.

CONCLUSION

The prevalence of stunting and wasting from the current study is lower than the national estimate. However, prevalence of stunting is higher than the national estimate. The prevalence of PEM was 17.6%. Age, maternal education, and gender had influence on malnutrition. Current nutritional interventions should be sustained and improved upon. Parents with children less than one year and male children may require additional

support to prevent malnutrition in this setting. A study to understand why male children are more exposed to malnutrition is warranted.

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Prevalence of Extended Spectrum of B-Lactamases and Metallo Beta Lactamases Producing Bacteriological Isolates with Correlative Epidemiological Study of ESBLs and MBLs in MGM Hospital

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ABSTRACT

Introduction: Extended spectrum of Beta lactamases and metallo Beta lactamases producing resistant bacteria in nosocomial infections was increasing the morbidity and hospital expenditures. The source of infection is either nosocomial or community acquired or health care personnel. Comprehensive studies of source for hospital acquired infection will facilitate the control of hospital acquired infections. To emphasize the formation of hospital infection control committee (HICC) in tertiary care and teaching hospitals, computerizing and preserving antibiotic resistant data in nosocomial infections and documenting the guidelines for antibiotic policy.

Material and methods: Pus, urine, sputum and blood samples from outpatient and inpatients of MGM Hospitals of Dept. of Microbiology during January-2014 to April 2014 were processed by standard laboratory procedure as per CLSI. Anti microbial susceptibility testing was done by Kirby-Baure's disk diffusion method. ESBLs producing strains were detected by double disk synergy test after initial screening with 3rd generation cephalosporins. MBL Producing organisms were detected by double disk synergy test with Imipenam and EDTA disks. Different swabs collected from NICU, AMC, Female surgical ward, Casualty, ICCU, ENT ward, Burns ward and Central Sterilization Department are processed by standard laboratory procedure as per CLSI guidelines. ESBLs producing strains were detected by double disk synergy test after initial screening with 3rd generation cephalosporins. MBL Producing organisms were detected by double disk synergy test with Imipenam and EDTA disks.

Results: Out of 217 blood culture positives 107 were ESBL (86) AND MBLs (21). Out of 240 sputum samples positive (72) were resistant bacterial strains ESBLs (49) and (23) were MBLs. Out of 185 pus culture samples (47) were resistant strains and ESBLs (35) and MBLs (12). Out of 88 swabs collected from various wards in MGM Hospital 30 were positive from resistant strains like 8 (ESBLs) and 3 MBLs and Vancomycin resistant staphylococci were 11 and remaining 8 were sensitive to routine antibiotics.

Conclusion: The Study reveals that serious therapeutic and epidemiological spread of ESBLs and MBLs in Patients, Hospital environment hence the necessity of formation of Hospital Infection Control Committee (HICC) and to record the different patterns of antibiotic resistance in the tertiary hospitals and to upload the save in WHO NET will control the global emergence of MDR bacterial strains.

Keywords: Extended spectrum of betalactamases, (ESBLs), Metallobetalactamases, ((MBLS) Hospital Infection Control Committee (HICC) Hospital acquired infections (HAI).

infections were increasing the morbidity and hospital expenditures. The source of infection is either nosocomial or community acquired or health care personnel. Comprehensive studies of source for hospital acquired infection will facilitate the control of hospital acquired infections.^{1,2} Resistant genes in bacteria confer an evolutionary advantage for survival and these traits are often associated with the emergence of multi drug resistant isolates.³ These bacteria harbor extended spectrum of beta lactamases and metallo beta lactamases turn into harmful super bugs. Hence detection of ESBL's and MBLs and documenting their prevalence in patients, healthcare personnel and hospital environment will decrease the morbidity and hospital expenditures.⁴ Over the last 25 years with each new class of new beta lactam antibiotics, new beta lactamases emerged which causes resistance to the particular class of drugs. These beta lactamases have been found in many different genera of Enterobacteriaceae and *P. aeruginosa*.³ Currently, no standardized method for MBL detection has been proposed, and despite PCR being highly accurate and reliable, its accessibility is often limited to reference laboratories. Several nonmolecular techniques have been studied, all taking advantage of the enzyme's zinc dependence by using chelating agents, such as EDTA.⁶⁻⁸ Early phenotypic detection of ESBLs and MBLs carrying organisms including those with susceptibility to 3rd and 4th generation cephalosporins and also to carbapenams is of paramount importance as it allows rapid initiation of strict infection control practices as well as therapeutic guidance for confirmed infection. And this study will focus on characterization of ESBL's and MBLs, and the importance of detection of these enzymes and their epidemiology.⁵

Aims of study

- To isolate and identify the ESBLs and MBLs producing bacteria from different bacteriological cultures.
- To correlate these organisms isolated from different bacteriological cultures with isolates from nosocomial or community acquired on health care personnel.
- To emphasize the importance of formation of Hospital Infection Control Committee (HICC) in teaching and

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INTRODUCTION

Extended spectrum of Beta lactamases and metallo betalactamases producing resistant bacteria in nosocomial

S. No.	Type of Culture Specimen	No. of Culture Specimens	No. of Positive Cultures	Sensitive to Routine Antibiotics	Resistant to Routine Antibiotics	DDST Positive for ESBLs	DDST Positive for MBLs
1.	Blood	740	217	110	107	86	21
2.	Urine	315	39	22	17	14	3
3.	Sputum	240	158	86	72	49	23
4.	Pus	185	72	25	47	35	12

Table-1: Results of showing the distribution Pattern of Positive Cultures Tests

S.No.	Resistant Strains	DDST Positive for % ESBLs	Percentage of ESBLs	DDST Positive MBLs	Percentage of MBLs.
1.	107	86	80.3%	21	19.7%
2.	17	14	82.3%	3	17.7%
3.	72	49	68.1%	23	31.9%
4.	47	35	74.5%	12	25.5%

Table-2: Results showing the Percentage of ESBLs and MBLs in Culture Positive Resistant Strains

S. No.	Name of the Ward	No. of Swabs Taken	No. of Swabs Showing Culture Sterile	No. of Swabs Showing Culture Positive
1.	NICU	8	7	1
2.	AMC	6	4	2
3.	FSW	8	8	3
4.	FMW	10	8	2
5.	Casualty	10	5	5
6.	MMW	9	7	2
7.	ICCU	10	9	1
8.	ENT	8	6	2
9.	CSD	9	5	4
10.	Burns Wards	10	2	8
Total		88	58	30

Table-3: Showing results of cultures in surveillance swabs

tertiary care hospitals.

- Computerizing and preserving the antibiotic resistant data in nosocomial infections which can be analyzed by all departments' clinicians which can act as a guide line for drafting an antibiotic policy.
- Uploading the same information in WHO NET that will control the global emergence of multidrug resistant strains.

MATERIAL AND METHODS

Total 740 blood culture samples, 315 urine culture samples, 240 Sputum culture samples and 185 pus culture samples were received in bacteriological section of department of microbiology, MGM hospital during January 2014 to April 2014 processed by standard laboratory procedure as per CLSI guidelines.² Anti microbial testing was done by Kirby – bauer disk diffusion method as a screening test ESBL testing was done by using Double disk synergy test (DDST) as per CLSI guidelines.³ Ceftazidime (30 µgm) with and without Clavulanic acid (10 µgm) were used.

The isolates which are resistant to 3rd generation Cephalosporins with Clavulanic acid and imipenam (10µgm) are subjected to Double Disk Synergy Test imipenam with EDTA to detect metallo beta lactamase activity.⁶ These imipenam EDTA disks were prepared by 2 methods.

The combined disk assay employs a B lactam disk usually a imipenam or ceftazidime to which an MBL inhibitor (IMBL) is

added by 2 methods.⁷⁻⁹

1. Added the IMBL solution directly on imipenam disk already placed on the Agar plate (AD).
2. Or with previously prepared disk (PP). There were clear cut increased inhibition zones in Double Disk Synergy Tests (DDSTs)

Different swabs collected from NICU, AMC, Female surgical ward, Casualty, ICCU, ENT ward, Burns ward and Central Sterilization Department were processed by standard laboratory procedure as per CLSI guidelines. ESBL and MBL Producing Bacteriological isolates were subjected to Double Disk Synergy Tests (DDSTs).

STATISTICAL ANALYSIS

Descriptive statistics like mean and percentage were used to infer data. Microsoft office 2007 was used to make tables.

RESULTS:

Out of 740 Blood culture samples, 217 Culture positive strains identified and 107 were resistant bacteriological strains to 3rd generation cephalosporins and identified 86 were ESBL Producing and 21 were MBL Producing strains as shown in Table-1. Out of 315 urine culture samples, 39 were culture positive and 17 were detected as resistant. Bacteriological strains with 14 ESBL producing strains 3 MBL producing strains. Out of 240 sputum sample 158 were culture positive and 72 were detected as resistant bacteriological strains with ESBLs 49 and MBLs were 23. Out of 185 pus culture samples 72 were detected as positives and 47 were resistant bacteriological s-trains with 35 ESBLs and MBLs were 12 as shown in Table-1 and Table-2. Out of 88 swabs collected from NICU, AMC, Female surgical ward, Casualty, ICCU, ENT ward, Burns ward and Central Sterilization Department, 30 among 88 swabs were culture positive 7 were positive from patients beds, 6 were positive from health care personnel, 4 positive from medicine trays and 13 were positive from walls and floors of Different wards, mainly from Burns wards. Out of 30 positive cultures 11 were resistant strains ESBLs (8) and MBLs (3), Vancomycin resistant Staphylococci were (11) and remaining (8) were sensitive to routine antibiotics as shown in Table-3.

Most commonly isolated organisms Klebsiella, Proteus, Pseudomonas, E.coli, Coagulase positive staphylococci, Coagulase negative staphylococci and Streptococcus pneumonia.^{7,9,10}

Out of 30 positive cultures 7 were positive from patients' beds, 6 were positive from health care personnel, 4 were positive medicinal trace and 13 were positive from walls and floors of different wards mainly from burns wards. Out of 30 positive cultures 11 were resistant strains ESBLs (8) 26.67% and MBLs (3) 10% and Vancomycin resistant staphylococci were 11 (36.6%) and remaining 8 (26.67%) were sensitive to routine antibiotics as shown in Table-3.

DISCUSSION

In this study among the resistant strains isolated from blood ESBLs were around 80.3% and MBLs were 19.7%. Among resistant strains isolated from urine culture ESBLs were 82.3% and MBLs were 17.7%. In sputum cultures the resistant strains show 68.1% and 31.9% MBLs. Out resistant strains obtained from pus culture ESBLs were 74.5% and MBLs were 25.5%.¹⁻³ This indicates the need of intense surveillance in institution to control the spread of resistant strains in hospital acquired infections and necessity of formation of HICC (hospital infection control committee) in teaching hospitals and also in tertiary care hospitals.⁴⁻⁶

The British Society of Antimicrobial Chemotherapy and Health Protection Agency of United Kingdom suggest testing of all isolates of gram negative bacteria with Ceftazidime (the best indicator for TEM and SHV derived ESBLs) and Cefotaxime (the best indicator for CTX-M types) or with Cefopodoxime (a good indicator for all ESBL types) as a first screening test. Girlyapur et. al. showed that Ceftazidime to have better sensitivity and specificity as a screening agent for efficient detection. PCR is not available in this institute. Ceftazidime, Cefotaxime and Cefopodoxime all drug disks were used for screening of ESBLs. Imipenem EDTA disks were used for confirmation of MBL producers.⁷⁻¹⁰

CONCLUSION

The Study reveals that serious spread of ESBLs and MBLs inpatients, hospital environment and health care personnel. Judicious use of antibiotics using carbapenams is essential to prevent hospital acquired infections. Hence the necessity of formation of Hospital Infection Control Committee (HICC) in all teaching hospitals and tertiary care hospitals and to record the different patterns of antibiotic resistance and ready availability of information in WHO NET will control the global emergence of MDR bacterial strains.

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Missed Opportunities for Immunization in Hospitalized Children in the 1-5 Year Age Group

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ABSTRACT

Introduction: The coverage of vaccination in India is far from complete despite the commitment for universal coverage and one of the barriers for the same is Missed Opportunities for Immunization (MOI). Thus, there is a need to evaluate the factors for MOI and remedies to improve the same.

Material and Methods: A cross sectional observational study was conducted at a tertiary care hospital on 585 hospitalized children in the 1-5 year age group to determine the magnitude and causes for MOI. The qualitative data was represented in the form of frequency and percentage tables with the help of SPSS 17.

Results: In our study, the magnitude of MOI was found to be 29.9%. MOI was found more among males (57.3%) than females (42.7%). Of the 585 subjects enrolled, 48.7% were Hindus, 46% were Muslims and 5.3% belonged to other religions. 91.1% of the study subjects hailing from an Urban area were completely immunized versus 8.9% from Rural areas. Higher percentage of MOI was found in children who were home delivered versus institutional deliveries. BCG vaccine had a 100% coverage. Despite having contact with a health care facility, 19.5% of the subjects weren't immunized and the most common reason for this was presence of minor illnesses like at that contact time. The average lag period of MOI in our study was 67.3 weeks. Measles vaccine had the highest lag period of 85.2 weeks. A statistically significant association ($p < 0.05$) with MOI were seen with gender, area of residence, place of delivery and antenatal immunization status.

Conclusion: In our setting, MOI were lower in girl children, institutional deliveries and children residing in an urban area. Multi-centric data, health education and recommendations would help improve the overall immunization coverage in the Indian subcontinent.

Keywords: Immunization, Missed Opportunities for Immunization.

INTRODUCTION

Immunization is the most cost effective method to reduce childhood mortality and morbidity. At the global and regional levels, actions are taken regularly like vaccination campaigns, training workshops and round table discussions to improve the overall coverage of immunization. It has been recently estimated that more than 98% of the incompletely immunized children are from developing countries.¹ The coverage of vaccination in India is far from complete despite the commitment for universal coverage. The risk factors associated with the delay in immunization include family size, number of children < 5 yrs, birth order, sex, religion, maternal and paternal education etc.¹ An opportunity for immunization is missed when a person who is eligible for immunization and has no contraindication to immunization, visits a health service and does not receive the needed vaccines.² The global magnitude of MOI is 0 to 99%.² Missed opportunities for immunization can occur

during visits for immunization wherein the health worker does not use appropriate contraindications to immunizations (Table-1) or when they do not routinely screen children for their immunization status and offer the recommended vaccines.³ Minimizing the missed opportunities for immunization is the easiest and best measure to improve vaccine coverage, thereby protecting the child against contracting an infectious disease. Thus this study was undertaken to determine the magnitude and factors responsible for missed opportunities of immunization at our institution and remedies to improve the same.

MATERIAL AND METHODS

A cross sectional observational study was conducted at a tertiary care center in a metropolitan city after obtaining approval from the Institutional Ethics Committee. By appropriate statistical methods sample size calculated was 576. However 585 patients over an 18 months (April 2013 to October 2014) period who fulfilled the inclusion criteria (availability of a primary care taker, availability of an immunization card or verbal recall of the primary care taker as a proof of immunization) and who signed a written consent were enrolled in the study. Patients admitted in the intensive care unit and under-vaccinated children without a prior health visit were excluded from our study. The primary care taker of the hospitalized child was interviewed within 24 hours of admission to avoid bias caused by immunization related interventions. We collected data pertaining to details of demographic profile, previous immunization details including dates of vaccines taken, previous health care facility visits, prior contraindication, if any, to previous vaccination, missed opportunities for vaccination and dissipation of immunization related health education to the primary caregivers. Universal Immunization Programme (UIP) (Table-2) was followed and the data with dates of immunization and age at administration of vaccine was noted.³ Lag period was calculated for individual subjects as the number of weeks between the actual age of administration of the vaccine versus the recommended cut off age (Table-3).³ Those children who were not immunized at the time of interview were referred to our immunization clinic and immunized.

STATISTICAL ANALYSIS

SPSS Version 17 was used for analysis. Predictiveness for MOI

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were analyzed by logistic regression analysis. Results were graphically represented where ever deemed necessary.

RESULTS

There were 1,384 patients admitted in the pediatric ward during the 18 months study period. Of the 750 children who were in the age group of 1-5 years, 585 children who fulfilled the inclusion criteria were enrolled in the study. 166 (28.4%) children were in the age group of 1 to 2 yrs, 158 children (27%) were between 2 to 3 yrs, 109 children (18.6%) between 3 to 4 yrs and 152 children (26%) were between 4 to 5 yrs. There were 218 boys and 192 girls enrolled in our study.

410 children (70.1%) were completely immunized and 175 children (29.9%) had MOI. 285 children were Hindus, 269 were Muslims and 31 belonged to other religions. MOI in Hindu children was 34.7%, in Muslims was 27.1% and in other religions was 9.7%.

52 (8.9%) children were from rural areas as compared to 533 (91.1%) children who were from an urban area. 25 of the 52 children (48.1%) from rural areas had MOI as compared to 150 of the 533 children (28.1%) from the urban areas.

The mother was the primary care taker in 62.9% children and MOI was 33.4% where the mother was the primary care taker, (22.5%) when the father was the primary care taker and (30.8%) when other relatives were the primary care takers.

The percentage of MOI in our study was seen in 34.9% in boys when compared to 23.2% in girls. 61.4% of Children who were delivered at home had MOI versus 27.4% who had institutional deliveries.

A 100% BCG vaccine coverage was noticed. The least coverage was for the Measles vaccine (78.8%). Vaccine coverage in our study is depicted in (Table-4). Under immunization in siblings was observed in 58.5% of the MOI patients.

19.5% of the MOI subjects had contact with a health care facility either in the private or public sector. Despite this the most common reason for MOI was a minor illness at the time of contact (false contraindication for immunization). 46 primary care takers believed that the vaccines had side effects.

Of the 175 MOI children 40 primary care takers were illiterate (57.1%), 96 had attended primary school (31.5%), 35 (17.9%) had attended secondary school and 4 (26.7%) were graduates. The average lag period for MOI in our study was 67.3 weeks and the Measles vaccine had average lag period of 85.2 weeks (minimum-4wks and maximum-230 wks).

A significant association of MOI (p<0.05) was observed with children who were home delivered, mostly from rural areas (Table-5). From the logistic regression analysis, independent

predictor variables for MOI in our study contributing to lesser chances of MOI were female gender, children born at an institution and hailing from urban areas.

DISCUSSION

The study was conducted to determine the contribution of MOI which was one of the hindrances to achieve 100% immunization coverage. The incidence of MOI in our study was 29.9%. Our

1.	Immunize children who are malnourished or mildly ill.
2.	Immunize pregnant women with Tetanus Toxoid.
3.	For children who have an illness requiring hospitalization the decision whether or not to immunize should be made by the treating doctor
4.	Human Immune Deficiency Virus (HIV) infection is not a contraindication to immunization
5.	BCG is contraindicated in children with symptomatic HIV infection
6.	A prior serious adverse event to a vaccine is a contraindication to immunization with the same
Table-1: Summary of Indications and Contraindications to EPI Vaccines³	

At birth	BCG and OPV0
6 weeks	DPT1, OPV 1 and HEP B1
10 weeks	DPT2, OPV2 and HEP B2
14 weeks	DPT3, OPV3 and HEP B3
9 months	Measles
Table-2: Recommended Immunization Schedule to Provide Protection at the Earliest Age as per EPI.³	

2 months	BCG and OPV0
3 months	DPT1, OPV 1 and HEP B1
5 months	DPT2, OPV2 and HEP B2
7 months	DPT3, OPV3 and HEP B3
10 months	Measles
Table-3: Cut off age for missed immunization used in the study were defined as follows.³	

Vaccine	Completely immunised as per schedule			
	Yes		No	
	N	%	N	%
BCG, OPV	585	100	0	0
DPT1/OPV1/HBV2	562	96.1	23	3.9
DPT2/OPV2/HBV2	539	92.1	46	7.9
DPT3/OPV3/HBV3	499	85.3	86	14.7
Measles	461	78.8	124	21.2
Table-4: Vaccine wise distribution of immunisation status				

Factors	Completely immunized	Missed opportunity	Percentage of MOI	chi-square tests	p value	
Gender	Male (335)	218	117	34.9%	9.338	0.002
	Female (250)	192	58	23.2%		
Place of delivery	Institutional (541)	393	148	27%	22.45	<0.05
	Home (44)	17	27	61.4%		
Antenatal Immunization status	Immunized (565)	402	163	28.7%	8.940	0.002
	Unimmunized (20)	8	12	60%		
Area of residence	Urban (533)	383	150	34.64%	9.890	0.003
	Rural (52)	27	25	48.1%		
Table-5: Association of the factors and MOI status of the study group (N=585) and (MOI=175).						

study documented a lower MOI compared to other studies.⁴⁻⁶ This can be attributed to the fact that our study was conducted in hospitalized sick patients receiving curative care versus other studies which included patients who received preventive and curative care.

Our study also focused on the factors which contributed to MOI. Girls were found to have lesser MOI than boys in our study. This can be explained on the basis that our study was conducted at a tertiary care center in a metropolis draining urban locality where there is minimal gender discrimination. However, study by Wadgave et al found males to be more completely immunized than females.⁷ No gender bias was observed by Jagrati et al.⁸ Other observations from our study were a lower incidence of MOI when parents were the primary caretaker. 61.4% of children who were home delivered had MOI versus 27.4% who were institutional deliveries. This could be attributed due to lack of sensitization and contact with health care workers in non-institutional deliveries.⁸ Hutchins et al also had a similar experience in their study.⁹

In our study the highest lag period was found for Measles vaccine, a finding similar to that observed by Desphande et al.¹¹ This could be attributed not only to the lack of awareness as well as the long duration between the 3rd dose of DPT/OPV/HepB and the Measles vaccine.

In our study 62.2% of the children were taken to a public sector institution for immunization. It was found that though the children with MOI had contact with a health care system many of them weren't immunized at the time of contact and the reasons for not immunizing at the time of contact with the health care system were minor illnesses (like fever, cough, cold, diarrhea) (66.7%), serious illness (25.4%) and non-availability of vaccines (7.9%). However in the earlier studies, the reasons for MOI despite having a contact with the health care system were found to be having minor illnesses at the time of contact, vaccine shortage, failure to administer multiple immunizations simultaneously, ineffective communication by health care providers and misconceptions associated with immunization.^{2,8,9,10,12}

Our study pointed out the factors contributing to MOI at our institution, which were home deliveries, lack of antenatal care and children from rural areas. Thus the MOI can be tackled by taking a detailed immunization history which can reduce its incidence. Appropriate policies should not only be formulated but also be implemented to ensure dissipation of basic health education to all citizens ensuring availability and affordability. Further research needs to be carried out to determine the specific age groups, geographic areas and immunization services which needs to be targeted to decrease the overall incidence of missed opportunities for immunization. The gaps in the knowledge, attitude and practices of health workers across all sectors of societies should be assessed and addressed because at some public sectors practice of not immunizing the children during minor illness is still prevalent.

Existing immunization programs need to be strengthened using the media and other channels of communication like door to door vaccination campaigns, role plays, propaganda by famous personalities using social media in a positive way etc. Inservice education and training is essential and immunization updates should be provided on a regular basis to all health workers.

CONCLUSION

Thus a combined effort from the clinicians and the community is required to decrease MOI and improve the vaccination coverage to reduce the child mortality and morbidity.

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Prevalence of Bacterial Isolates in Endotracheal Tube According to Culture and Sensitivity in Patients of Intensive Care Unit of A Tertiary Medical College and Hospital, Kolkata, West Bengal

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ABSTRACT

Introduction: Hospital acquired infection (HAI) in intensive care units (ICU) are responsible for high morbidities and mortalities worldwide due to emergence of resistant bacteria. This burden is under estimated in developing countries which may be due to improper surveillance, misuse of antibiotics and improper use mechanical devices. Our aim of the study was to detect spectrum of bacterial isolates and their antimicrobial sensitivity in K P C Medical College Hospital, Jadavpur, and Kolkata.

Material and methods: We collected endotracheal tube aspirates from 739 patients of ICU and specimens were processed. After 48 hours of incubation, colonies of bacterial isolates were inoculated in different antimicrobial disc. The results obtained were analyzed in SPSS version 17 software. Value of <0.05 was accepted as significant.

Results: Males were significantly affected than females ($p=0.00$) by gram negative bacteria, like, klebsiella, acinetobacter, pseudomonas, citrobacter, enterobacter. But cedecea lapagei only affected female patients (2 cases). Incidence of gram negative isolates were highly significant gram positive bacteria ($p=0.00$). Most of the gram negative bacilli were highly sensitive to polymyxin B, colistin, whereas, extended spectrum beta lactamase (ESBL) and AMPC producing klebsiella were 100% sensitive to carbapenem group, and ESBL producing E coli as well as proteus group demonstrated high sensitivity to both carbapenem and aminoglycoside group of antibiotics.

Conclusion: This wide spectrum of resistance to different antibiotics was mostly due to different iatrogenic factors, like, improper surveillance of the patients, improper and inadvertent use of antibiotics, and unnecessary use of costly and higher generations of antibiotics, use of mechanical devices in improper way and many morbid factors, like, age, diabetes. So, if the above factors can be looked into, the violent antibacterial resistance can be tackled and mortality rate can be lowered. So, we need serious thinking about the administration of antibiotics in case of sepsis and during any invasive procedure and regular ICU fumigation.

Keywords: Endotracheal tube aspirates, culture and sensitivity, gram negative and gram positive bacteria, patients in Kolkata.

INTRODUCTION

Hospital acquired infection (HAI) is most serious and burning problem and responsible for high rate of morbidities and mortalities worldwide.¹ It has been shown that in developed countries 5% to 15% patients in regular wards suffered from HAI and 50% patients in intensive care units (ICU), where as in developing countries this burden is somewhat underestimated which may be due to lack of knowledge of proper surveillance, proper resources and most important, proper guidance.² But according to WHO, in 2005 the burden in the developing countries were 25%.³ In ICU, most of the patients suffered from urosepsis, life threatening nosocomial infection, post-surgical

infections, lower respiratory infections, sepsis with multi organ dysfunction syndrome, whereas, in the regular wards surgical patients, orthopedic patients suffered from mostly from post surgical problem. In creased susceptibility in these patients are due to their old age, underlying morbid disease, like, diabetes and depressed immunity due to treatment with chemotherapeutic drugs.⁴ The modern apparatuses responsible for HAI are endotracheal tube, catheter, and different surgical appliances. So, obviously respiratory tract infections, urinary tract infection, deep ulcerations in the body are the result of the use of the modern instruments.⁵⁻⁷ Since ICU is mainly responsible for caring of the patients suffered from life threatening infections, constant vigilance and monitoring, support with modern surgical apparatus and life saving medications has to be provided with ultimate aim to give proper relief to the patients. In case of intubated patients, colonization in the respiratory tract is most common.⁸ Again, mechanical ventilation is responsible 6 to 10 fold increase the risk of respiratory tract infections.^{9,10} In this case tracheal colonization of bacterial isolates may be responsible for added or super infections and at the same time, increases the risk of mortality. Again, due to inadvertent and irrational use of antibiotics, there are increasing emergence of drug resistant bacteria, this in turn, increases the percentage of mortality. So, obviously, it is a new challenge for critical care physicians to treat these patients.¹¹ These drug resistant bacteria are gram negative bacteria prevalent all over the world.¹²⁻¹⁴ So, the aim in our study was to detect the spectrum of bacterial isolates and their antibacterial sensitivity in K P C Medical College and Hospital, Jadavpur, Kolkata in last five years.

MATERIAL AND METHODS

This 7 years' cross sectional study (2009-2015) was carried out after getting clearance from our college Ethical committee.

Criteria of selection

1. Cough with purulent sputum, fever with infiltration in the chest x-ray.
2. Above symptoms and signs not responding to conventional antibiotics.
3. Sepsis with multi-organ dysfunction syndrome and

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infiltration in the lung.

Rejection criteria

1. Poor collection of sample
2. Containers are externally soiled
3. Leakage of the container
4. If the samples collected contain more than 10 squamous epithelial cells per low power field as well as bacteria.

We collected seven hundred and thirty nine endotracheal tube samples very aseptically. All the patients who were admitted in ICU of our hospital were on mechanical ventilation. We collected the data from the enrolled patients in the form of:

Name, age, sex, underlying illness, dates of admission in our hospital, date of endotracheal tube intubation, date of sample collection and detail of antibiotic therapy prior to collection of samples.

Process of collection

The samples were collected using suction catheter introducing through the endotracheal tube up to a distance of approximately 26 cm. Firstly samples were collected without introducing saline. But in few cases, tracheal aspirates were very thick. In that case 2 ml of 0.9% sterile normal saline was introduced to liquefy the secretions and was collected into a container.

Processing of sample

The collected specimen was kept in a sterile container and was sent immediately to microbiology department for culture and sensitivity. This was inoculated in thioglycollate broth and incubated for 24 hours at 37° C. After 24 hours the broth was examined primarily for the evidence of growth of the bacteria by direct gram stain smear. Smear was examined in the low power field (LPF) under oil immersion microscope (X100) for detection of squamous epithelial cells and polymorphonuclear neutrophils (PMN). Same preparation was examined in the high power field microscope under oil immersion (magnification X100) for any presence of bacteria.

Then from the same broth sample was collected using calibrated loop, it was collected and inoculated on the four quadrant streak technique on the blood agar, chocolate agar and McConkey agar. Then these inoculated plates were incubated at 37° C for 24 to 48 hours.

After 48 hours this culture was read by observing the four quadrant growth. It suggests approximate number of colony forming unit per ml. (CFU/ml) of bacteria per ml. The cultures were graded as 1+, 2+, 3+, and 4+ depending upon mild, moderate and severe and very severe growth.

To measure variable biochemical behavior of the bacterial strain, extensive biochemical tests were performed, like, triple sugar iron test(TSI), citrate utilization test, Motility indole Urease test (MIU), oxidase test, Coagulase test, catalase test, DNase test etc. as per manual methods of general bacteriology by American Society of Microbiology.¹⁵

The obtained organism was diluted in 2-3 ml of sterile normal saline. Then the sample was swabbed on the antibiotic disc with the sterile cotton swab as per Clinical and Laboratory Standards Institute (CLSI) standard guideline.¹⁶

Antibiotic disc used from Gram negative bacilli were gentamicin, tobramycin, Netilmicin, amikacin, cefexime, ceftriaxone, ciprofloxacin, ofloxacin, levofloxacin, cotrimoxazole, chloramphenicol, tetracycline, tigicycline,

piperacillin-tazobactam, cefoperazone-sulbactam, ceftazidime, imipenem, meropenem, ertapenem, aztreonam, cefotaxime, polymyxin B, colistin. For Gram positive cases, amoxicillin, oxacilin, amoxicillin-clavauronic acid, piperacillin-tazobactam, cefoperazone-sulbactam, cefuroxime, ceftriaxone, cefexime, ceftazidime, azithromycin, erythromycin, ertapenem, meropenem, imipenem, gentamicin, tobramycin, Netilmicin, amikacin, ciprofloxacin, ofloxacin, levofloxacin, cotrimoxazole, chloramphenicol, teicoplanin, tigicycline, clindamycin, vancomycin, tetracycline, linazolid, polymyxin B, colistin disc were used.

The results were analyzed in the following manner –

1. Year-wise predominance of sexes according to culture positivity.
2. Organism-wise significance of sex involvement.
3. Incidence of gram positive and gram negative bacteria.
4. Presence of culture-sensitivity in case bacterial isolates.

STATISTICAL ANALYSIS

Above data were analyzed by statistical software SPSS version 17. A value of $p < 0.05$ was accepted as significant. Chi square test was used to find the significant correlation between variables.

RESULTS

In this study, males were significantly affected than the females with respect to all the years ($p=0.00$). In the year 2011 and 2013 percentages of positivity were higher as compared to other years (17.35% in 2011 and 18.49% in 2013) (Table-1).

Males were significantly infected with Klebsiella group (ESBL producer, ESBL and AMPC producer and non-ESBL and non AMPC producer), all acinetobacter baumannii, citrobacter, enterobacter, ESBL producing E coli, pseudomonas aeruginosa as compared to females (Table-2).

Again, gram negative organisms were significantly involved as compared to gram positive organisms (Gram negative = 429 vs. Gram positive = 9, $p=0.00$) (Table-3).

ESBL producing Klebsiella pneumoniae was highly sensitive to piperacillin-tazobactam (52.63%), polymyxin B and colistin (90.69%). Non ESBL and AMPC producer Klebsiella and AMPC producer Klebsiella sensitive to ertapenem, imipenem and meropenem (55.81%, 65.11% and 56.97% respectively), polymyxin B and colistin (90.69%). On the other hand ESBL and AMPC producing Klebsiella were sensitive to ertapenem, imipenem and meropenem (90.90% to 100%) and carbapenemase producing Klebsiella were highly sensitive to polymyxin B and colistin (95.65%). Citrobacter were highly sensitive to chloramphenicol (60%) and polymyxin B and colistin (90%) and enterobacter sensitive to polymyxin B (62.5%) and colistin (68.75%) only. Again, gram positive bacteria staphylococcus were highly sensitive to vancomycin, teicoplanin and linazolid (99.99%), chloramphenicol (88.88%) followed by tetracycline and tigicycline (55.55%). Proteus vulgaris were 100% sensitive to imipenem but 66.66% to all macrolide groups of antibiotics. On the other hand proteus mirabilis were 100% sensitive to cefoperazone-sulbactam and carbapenem groups. Acinetobacter baumannii (both MBL and non MBL producer), pseudomonas aeruginosa (MBL inhibitor) were significantly sensitive to polymyxin B and colistin (97.72%, 97.05% and 100% respectively). On the other hand pseudomonas aeruginosa

(non MBL inhibitor) were highly sensitive to imipenem and meropenem (58.90% and 60.27% respectively) in addition to polymyxin B and colistin (100% sensitive). Again E coli (ESBL producer) were highly sensitive to imipenem group (88.88%) followed by piperacillin, cefoperazone and polymyxin B and colistin (66.66%) and aminoglycoside group of antibiotics (55.55%) whereas, non MBL producer E coli were highly sensitive to polymyxin B and colistin (85.71%). Non lactose

fermenting bacilli were moderately sensitive to cephalosporin (58.33%), gentamicin, levofloxacin, vancomycin, teicoplanin, polymyxin B and colistin (50% each). (Table 4a-d)

Incidence of acinetobacter baumannii positivity was highest (145, 33.33%), followed by Klebsiella pneumoniae (139, 31.73%), and pseudomonas pneumoniae (82, 18.72%), whereas, incidence of proteus group and E coli, enterobacter were very low (6, 1.36%, 16, 3.65% respectively). (Table-5).

DISCUSSION

In our study, the incidence of positivity was 59.26% (438 out of 739 cultures). In the study done by Ghosh B et al. presence of positivity was 50.09% (271 positive case out of 541 total cases).¹⁵ Incidence of positivity in males was 69.17%, which was significant as compared to females (26.25%, p=0.00), which was similar to the study done by Ghosh B et al.¹⁵

In our study, incidences of prevalent bacteria were acinetobacter baumannii (33.33%), Klebsiella group (31.73%), pseudomonas aeruginosa (18.72%), staphylococcus (2.05%), E coli and enterobacter group (3.65%). So incidence of acinetobacter was highest followed by Klebsiella. But, in the study done by Ghosh

Years	Total cases (438)	Males (Percentage) (303)	Females (Percentage) (135)	"p" value
2009	54 (12.32%)	39	15	0.00
2010	60 (13.69%)	47	13	0.00
2011	76 (17.35%)	55	21	0.00
2012	50 (11.41%)	37	13	0.00
2013	81 (18.49%)	54	27	0.00
2014	58 (13.24%)	32	26	0.01
2015	62 (14.15%)	39	23	0.00

Table-1: Year –wise male and female distribution of bacterial isolates

Bacterial isolates (Total 438)	Males	%	Females	%	P value
NLFGNB (12) (2.73%)	8	66.66	4	33.33	0.10
Kleb Pneu (86) (19.63%)	54	62.79	32	37.20	0.00
Citrobacter (10) (2.28%)	9	90	1	10	0.00
Enterobacter (16) (3.65%)	14	87.5	2	12.5	0.00
Staphylococcus (9) (2.05%)	5	55.55	4	44.44	0.63
Pr. Vulgaris (3) (0.68%)	1	33.33	2	66.66	0.41
Pr. Mirabilis (3) (0.68%)	3	100	0	0	Not done
Ac. Baumannii (MBL producer) (44) (10.04%)	31	70.45	13	29.54	0.00
Ps. Aeruginosa (Metallo-beta lactamase inhibitor) (9) (2.05%)	6	66.66	3	33.33	0.15
E Coli (ESBL producer) (9) (2.05%)	8	88.88	1	11.11	0.00
E Coli (7) (1.59%)	4	57.14	3	42.85	0.59
Ac. Baumannii (102) (23.28%)	67	65.68	35	34.31	0.00
Ps. Aeruginosa (73) (16.66%)	54	73.92	19	26.02	0.00
Kleb Pneu. (ESBL producer) (19) (4.33%)	15	78.94	4	21.05	0.00
Kleb Pneu. ESBL and AMPC producer (11) (2.51%)	8	72.72	3	27.27	0.03
Kleb Pneu (Carbapenamase producer) (23) (5.25%)	16	69.56	7	30.43	0.00
Cedecea Lapages (2) (0.45%)	0	0	2	100	Not done

Table-2: Sex wise distribution of bacterial isolates:

Gram negative organism	Gram positive organism	P value
NLFGNB (12) (2.73%)	Staphylococcus (9) (2.05%)	0.00
Kleb Pneu (86) (19.63%)		
Citrobacter (10) (2.28%)		
Enterobacter (16) (3.65%)		
Kleb Pneu. (ESBL producer) (19) (4.33%)		
Kleb Pneu. ESBL and AMPC producer (11) (2.51%)		
Kleb Pneu (Carbapenamase producer) (23) (5.25%)		
Pr. Vulgaris (3) (0.68%)		
Pr. Mirabilis (3) (0.68%)		
Ac. Baumannii (MBL producer) (44) (10.04%)		
Ps. Aeruginosa (Metallo-beta lactamase inhibitor) (9) (2.05%)		
E Coli (ESBL producer) (9) (2.05%)		
Ac. Baumannii (102) (23.28%)		
Ps. Aeruginosa (73) (16.66%)		
Cedecea Lapages (2) (0.45%)		
Total = 429	Total= 9	

Table-3: Comparison between gram positive and gram negative bacteria

Organism(438)	PEN	AMX	OX	AMC	PIPT	CES	CEF	CFT	CXT
NLFGNB (12)	0	3(25%)	3(25%)	3(25%)	5(41.66%)	0	4(33.33%)	0	1(8.33%)
Kleb Pneu (86)	0	3(3.48%)	0(0%)	10(11.62%)	25(29.06%)	16(18.60%)	7(8.13%)	10(11.62%)	8(9.30%)
Kleb Pneu-ESBL producer (19)	0	0	0	2(10.52%)	10(52.63%)	9(47.36%)	0	0	3(15.78%)
Kleb Pneu- ESBL and AMPC producer (11)	0	0	0	0	2(18.18%)	3(27.27%)	0	0	0
Kleb Pneu- Carbenamase producer (23)	0	0	0	0	0	0	0	0	0
Citrobacter (10)	0	0	0	0	3(30%)	2(20%)	0	0	0
Enterobacter (16)	0	0	0	0	5(31.25%)	3(18.75%)	1(6.25%)	1(6.25%)	1(6.25%)
Staphylococcus (9)	0	1(11.11%)	2(22.22%)	2(22.22%)	3(33.33%)	0	3(33.33%)	0	0
Proteus Vulgaris (3)	0	0	0	0	1(33.33%)	0	0	0	0
Proteus Mirabilis (3)	0	0	0	0	0	3(100%)	1(33.33%)	0	1(33.33%)
Ac. Baum-MBL prod.(44)	0	0	0	0	5(11.36%)	6(13.63%)	0	0	0
Ac. Baum (102)	0	0	1(0.98%)	15(14.70%)	20(19.60%)	10(9.80%)	1(0.98%)	7(6.86%)	1(0.98%)
Ps. Aeru (MBL inhibitor (9)	0	0	0	0	2(22.22%)	1(11.1%)	0	0	0
Ps. Aeru (73)	0	2(2.73%)	0	2(2.73%)	34(46.57%)	24(32.87%)	1(1.36%)	4(5.47%)	2(2.73%)
E coli-ESBL producer (9)	0	0	0	1(11.11%)	6(66.66%)	6(66.66%)	0	0	4(44.44%)
E coli (7)	0	0	0	2(28.57%)	5(71.42%)	4(57.14%)	1(14.28%)	2(28.57%)	3(42.85%)
Cedecea Lapagei (2)	0	0	0	0	2(100%)	0	0	0	0

Table-4(a): Antibiotic sensitivity of bacterial isolates

Organism(438)	CFZ	CTR	CFP	AZ	ER	AZT	ERT	IMP	MEP
NLFGNB (12)	2(16.66%)	1(8.33%)	5(41.66%)	4(33.33%)	1(8.33%)	2(16.66%)	5(41.66%)	3(25%)	4(33.33%)
Kleb Pneu (86)	10(11.62%)	9(10.46%)	10(11.62%)	1(1.16%)	0	4(4.65%)	48(55.81%)	56(65.11%)	49(56.97%)
Kleb Pneu-ESBL producer (19)	0	0	0	0	0	0	13(68.42%)	14(73.68%)	14(73.65%)
Kleb Pneu- ESBL and AMPC producer (11)	0	0	0	0	0	0	10(90.90%)	11(100%)	11(100%)
Kleb Pneu- Carbenamase producer (23)	0	0	0	0	0	0	2(8.69%)	2(8.69%)	2(8.69%)
Citrobacter (10)	0	0	0	0	0	0	5(50%)	5(50%)	5(50%)
Enterobacter (16)	1(6.25%)	1(6.25%)	1(6.25%)	1(6.25%)	0	1(6.25%)	4(25%)	5(31.25%)	5(31.25%)
Staphylococcus (9)	0	3(33.33%)	0	3(33.33%)	1(11.11%)	0	2(22.22%)	2(22.22%)	2(22.22%)
Proteus Vulgaris (3)	0	0	0	0	0	0	0	3(100%)	1(33.33%)
Proteus Mirabilis (3)	0	0	0	0	0	0	3(100%)	3(100%)	3(100%)
Ac. Baum-MBL prod.(44)	0	0	0	0	0	1(2.27%)	1(2.27%)	1(2.27%)	1(2.27%)
Ac. Baum (102)	5(4.90%)	7(6.86%)	7(6.86%)	1(0.98%)	0	3(2.94%)	16(15.68%)	43(42.15%)	40(39.21%)
Ps. Aeru (MBL inhibitor (9)	0	0	0	0	0	1(11.11%)	0	0	0
Ps. Aeru (73)	10(13.69%)	3(4.10%)	6(8.21%)	9(12.32%)	0	45.47%	9(12.32%)	43(58.90%)	44(60.27%)
E coli-ESBL producer (9)	0	0	0	0	0	0	8(88.88%)	8(88.88%)	8(88.88%)
Ecoli (7)	2(28.57%)	2(28.57%)	2(28.57%)	1(14.28%)	0	0	3(42.85%)	4(57.14%)	4(57.14%)
Cedecea Lapagei (2)	0	0	0	0	0	0	0	0	0

Table-4(b): Antibiotic sensitivity of bacterial isolates:

Organism(438)	GET	TOB	NIT	AMK	CIP	OF	LIV	COT	CHLO
NLFGNB (12)	6(50%)	2(16.66%)	3(25%)	8(66.66%)	7(58.33%)	2(16.66%)	6(50%)	4(33.33%)	3(25%)
Kleb Pneu (86)	25(29.06%)	24(27.90%)	23(26.74%)	38(44.15%)	19(22.09%)	12(13.95%)	13(15.11%)	16(18.60%)	10(11.62%)
Kleb Pneu-ESBL producer (19)	7(36.54%)	5(26.32%)	6(31.57%)	7(36.54%)	4(21.05%)	4(21.05%)	4(21.05%)	1(5.26%)	8(42.10%)
Kleb Pneu- ESBL and AMPC producer (11)	3(27.27%)	2(18.18%)	4(36.36%)	4(36.36%)	0	0	0	1(9.09%)	2(18.18%)
Kleb Pneu- Carbapenase producer (23)	2(8.69%)	2(8.69%)	2(8.69%)	2(8.69%)	0	0	1(4.34%)	1(4.34%)	3(13.04%)
Citrobacter (10)	1(10%)	1(10%)	2(20%)	1(10%)	0	1(10%)	3(30%)	0	6(60%)
Enterobacter (16)	2(12.5%)	3(18.75%)	5(31.25%)	3(14.75%)	1(6.25%)	1(6.25%)	2(12.5%)	0	3(18.75%)
Staphylococcus (9)	4(44.44%)	3(33.33%)	4(44.44%)	4(44.44%)	3(33.33%)	4(44.44%)	6(66.66%)	4(44.44%)	8(88.88%)
Proteus Vulgaris (3)	2(66.66%)	2(66.66%)	2(66.66%)	2(66.66%)	0	0	0	0	0
Proteus Mirabilis (3)	0	0	0	0	1(33.33%)	1(33.33%)	1(33.33%)	0	1(33.33%)
Ac. Baum-MBL prod.(44)	4(9.09%)	2(4.54%)	3(6.81%)	2(4.54%)	1(2.27%)	1(2.27%)	3(6.81%)	1(2.27%)	3(6.81%)
Ac. Baum (102)	23(22.54%)	27(26.47%)	19(18.62%)	21(20.58%)	14(13.72%)	8(7.84%)	30(29.41%)	17(16.66%)	14(13.72%)
Ps. Aeru (MBL inhibitor (9)	0	0	0	0	0	0	0	0	0
Ps. Aeru (73)	35(47.94%)	31(42.46%)	27(36.98%)	39(53.42%)	29(39.72%)	12(16.43%)	32(43.83%)	10(13.69%)	0
E coli-ESBL producer (9)	5(55.55%)	5(55.55%)	5(55.55%)	5(55.55%)	4(44.44%)	4(44.44%)	5(55.55%)	1(11.11%)	5(55.55%)
Ecoli (7)	3(42.85%)	4(57.14%)	5(71.42%)	3(42.85%)	3(42.85%)	3(42.85%)	4(57.14%)	4(57.14%)	1(14.28%)
Cedecea Lapagei (2)	0	0	0	0	0	0	0	0	0

Table-4(c): Antibiotic sensitivity of bacterial isolates:

Organism(438)	TEI	TIG	CLIN	VAN	TEI	LIZ	POL	COL	TIC
NLFGNB (12)	4(33.33%)	5(41.66%)	3(25%)	6(50%)	6(50%)	5(41.66%)	6(50%)	6(50%)	0
Kleb Pneu (86)	26(30.23%)	49(56.97%)	0	0	2(2.32%)	0	78(90.69%)	78(90.69%)	6(6.97%)
Kleb Pneu-ESBL producer (19)	6(31.57%)	14(73.68%)	0	0	0	0	12(63.15%)	12(63.15%)	4(21.05%)
Kleb Pneu- ESBL and AMPC producer (11)	2(18.18%)	7(63.63%)	0	0	0	0	1(5.78%)	1(5.78%)	1(5.78%)
Kleb Pneu- Carbapenase producer (23)	4(17.39%)	17(73.91%)	0	0	0	0	22(95.65%)	22(95.65%)	0
Citrobacter (10)	1(10%)	6(60%)	0	0	0	0	9(90%)	9(90%)	0
Enterobacter (16)	4(25%)	6(37.5%)	0	1(6.25%)	1(6.25%)	1(6.25%)	10(62.5%)	11(68.75%)	3(18.75%)
Staphylococcus (9)	5(55.55%)	7(77.77%)	3(33.33%)	9(99.99%)	9(99.99%)	9(99.99%)	0	0	0
Proteus Vulgaris (3)	0	0	0	0	0	0	0	0	0
Proteus Mirabilis (3)	0	0	0	0	0	0	0	0	1(33.33%)
Ac. Baum-MBL prod.(44)	5(11.36%)	30(68.18%)	0	0	0	0	43(97.72%)	43(97.72%)	0
Ac. Baum (102)	18(17.64%)	40(39.21%)	0	0	2(1.96%)	0	99(97.05%)	99(97.05%)	9(8.82%)
Ps. Aeru (MBL inhibitor (9)	0	0	0	0	0	0	9(100%)	9(100%)	0
Ps. Aeru (73)	1(1.36%)	1(1.36%)	0	0	0	0	73(100%)	72(98.63%)	6(8.21%)
E coli-ESBL producer (9)	5(55.55%)	7(77.77%)	0	0	0	0	6(66.66%)	6(66.66%)	1(11.11%)
Ecoli (7)	3(42.85%)	2(28.57%)	0	0	1(14.28%)	0	6(85.71%)	6(85.71%)	0
Cedecea Lapagei (2)	0	0	0	0	0	0	0	0	2(100%)

Table-4(d): Antibiotic sensitivity of bacterial isolates

Bacteria	Total number of positivity	Percentage of positivity(%)
Klebsiella	139	31.73
Acinetobacter baumannii	146	33.33
Pseudomonas aeruginosa	82	18.72
E coli	16	3.65
Proteus	16	1.36
Non lactose fermenting bacilli	12	2.73
Enterobacter	16	3.65
Staphylococcus aureus	9	2.05

Table-5: Percentage of positivity of bacterial isolates:

et al, commonest culture isolates was Klebsiella (36%) followed by staphylococcus (24%) but acinetobacter was only 8% and least common isolates were enterobacter (1%).¹⁵ In our study, the second last commonest bacterial isolates were enterobacter (3.65%) and E coli (3.65%). Again, according to the study by Amini et al. in 2008 – 2009, staphylococcus aureus was the commonest isolate which was contradictory to our study.⁶ On the other hand, in the study of D K Azar et al. and Adair et al. enterobacter and pseudomonas aeruginosa were the most common isolates which were partially contrary to our study, because in our study incidence of pseudomonas isolates was 18.72% and enterobacter isolates was 3.65%.^{17,18}

In the study of Rahbar et al. in 2006, gram isolates was 75% and Klebsiella pneumoniae 20% and staphylococcus 15.2%. It was similar to our study because this study demonstrated very high incidence of gram negative isolates (97.94%) and klebsiella (31.73%).¹⁹ In the same study incidence of enterobacter was 3% which was similar to the observation found in our study (3.65%). But incidence of staphylococcus aureus isolates was 15.2% in the study of Rahbar et al; this is significant higher than our result (2.05%).¹⁹ In the study in Bangladesh, incidence of acinetobacter was highest (25%) followed by pseudomonas (15%) and klebsiella (10%), which was similar to our study where incidence of bacterial isolates were nearly similar but incidence were very high (acinetobacter 33.33%, klebsiella 31.77% and pseudomonas aeruginosa 18.72%). It has been obvious from the different studies throughout the world that different bacterial isolates are significantly prevalent in different countries which may be due to different factors, like, prevalence of bacterial isolates in the hospital, inadvertent uses of antibiotics, different morbid factors, like, diabetes, use of immunosuppressive therapies, decreased immunity, chronic disease, like, chronic liver disease, interstitial pulmonary fibrosis, bronchial asthma, stroke, malignancies, chronic renal failure. Again, in case of chronic renal failure due to non use or use in low dose of antibiotics which are usually excreted through urine is also a burning factor.

Pseudomonas aeruginosa, a potential opportunistic pathogen is responsible for initiating nosocomial infections in ICU. In our study, these patients demonstrated sensitivity only to polymyxin B and colistin to nearly 100% and moderate sensitivity to carbapenem group of drugs (55% -- 60%), which is similar to the study done by Salma KB et al and Vincent JL et al.^{20,21} But in study done by Haque L et al. pseudomonas demonstrated high resistance to cotrimoxazole and moderate resistance to aminoglycoside group of antibiotics.²²

In our study, enterobacter was highly resistant to all the drugs except moderate sensitivity to polymyxin B and colistin (62.5% and 68.5% respectively) which was similar to the study done by D K Azar and Trautman M et al. where it demonstrated high resistance to all commonly used drugs.^{17,22}

In our study, ESBL producing Klebsiella were moderate to highly sensitive to polymyxin B, colistin and tigicycline (63.15% to 73.68%), ESBL and AMPC producing klebsiella were 90% to 100% sensitive to carbapenem group and carbapenemase producing klebsiella were more than 95% sensitive to polymyxin B and colistin (95.65%). But in the study done by Haque L et al. klebsiella was more than 40% to 60% sensitivity to colistin, ciprofloxacin, amikacin and meropenem.²³

ESBL producer and non-ESBL producer E coli in our study were moderately sensitive to piperacillin-tazobactam (66.66 and -- 71.42%), cefoperazone-sulbactam (57.24% -- 66.66%), aminoglycoside group (55.55% -- 71.42%), levofloxacin, co-trimoxazole and chloramphenicol (55.55% -- 57.14%), moderate to highly sensitive to carbapenem group (57.14% to 88.88%), polymyxin B and colistin (66.66% in case of ESBL producing E coli and 85.71% in case of non ESBL producing E coli). This is similar to observations done by Haque L et al, where E coli were highly sensitive to aminoglycoside group, colistin, piperacillin, meropenem.²³

In our study, acinetobacter baumannii was highly sensitive only to polymyxin B and colistin (97% to 98%) and moderately sensitive to tigicycline (68.18%), but only 9% to 20% sensitive to piperacillin and cephoperazone-sulbactam and 20% to 27% sensitive to aminoglycoside group. MBL producing acinetobacter was moderately sensitive to tigicycline (68.18%) and non-MBL producing acinetobacter was 39.21% sensitive to tigicycline. But in the study of Hoque, acinetobacter was 100% sensitive to colistin but 100% resistant ceftriaxone and amikacin. The factors for the development of rapidly emerging highly resistant acinetobacter baumannii are many, like, longer duration of stay in ICU, use of mechanical devices, inadvertent use of broad-spectrum antibiotics, like, fluoroquinolone, carbapenem, third generation cephalosporins.²⁴

In our study, *Cedecea lapagei* was only sensitive to ticarcillin; whereas, in a case report of Peretz V, et al. this bacteria was sensitive to fluoroquinolone group, carbapenem group, cotrimoxazole and ceftazidime.²⁵ Again, in the study of Lopez LAS, three case of *Cedecea lapagei* were sensitive to aminoglycoside group.²⁶

CONCLUSIONS

Males were significantly affected by klebsiella group, acinetobacter, pseudomonas, citrobacter, E coli in terms of bacterial isolates as compared to females in our city. Most common bacterial isolates in our city were gram negative, like, acinetobacter baumannii followed by klebsiella and pseudomonas aeruginosa, least common being proteus species. Only one gram positive bacteria were staphylococcus aureus. Most of the gram negative organisms were highly sensitive to polymyxin B and colistin except ESBL and AMPC producing klebsiella, who were nearly 100% sensitive to carbapenem group. In addition proteus group, E coli (ESBL producer) demonstrated high sensitivity to carbapenem group and aminoglycoside group. Prevention of emergence of antibiotic resistant bacteria

can be avoided by prevention of few preventable factors, like, firstly, inadvertent use of antibiotics, secondly, long duration of stay which may be unnecessary in ICU, thirdly, unrestricted use of mechanical use, Regular fumigation of ICU.

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A Study of Myocardial Bridges on the Coronary Arteries

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ABSTRACT

Introduction: Myocardial bridge is the muscle overlying the coronary arteries. Such an artery passing below it is called a Tunneled Artery. There has been a close association between the myocardial bridges on coronary arteries and the ischaemic heart diseases and cardiomyopathies. Aim of the study was to find out the proportion of myocardial bridges in human hearts.

Material and methods: Forty eight human hearts were collected from dissection hall of Government Medical College Kottayam, which were preserved in 10% formalin and dissected to expose the major coronary arteries and the myocardial bridges associated with them.

Result: 56.2% of the specimens have myocardial bridges (MB). MB was seen mostly on left coronary artery (43.7%) than the right coronary artery (21.4%).

Conclusion: The presence of myocardial bridges in such a high number is of importance in the Ischaemic Heart Disease. The knowledge of myocardial bridges is useful in the diagnosis, prevention and treatment of Ischaemic Heart Disease.

Keywords: Bridges, Coronary, Formalin, Ischaemia.

INTRODUCTION

Myocardial bridge was the muscle overlying the coronary arteries. Such an artery passing below it is called a Tunneled Artery. Myocardial bridging of coronary arteries were recognized and described by Black S.¹ Other authors^{2,3} and Polacek⁴ described these bridges as two forms, the muscular bridges and muscular loops. Tunneled Arteries have a segmental intra myocardial course. During systole, this segment of artery is compressed which is known as milking. They have a dynamic and phasic nature of obstruction different from fixed coronary stenosis. This may predispose to coronary thrombosis, atherosclerosis, myocardial infarction or sudden death.

Aim of the study is to find out the proportion of myocardial bridges in human hearts preserved in the dissection hall of department of Anatomy, Govt. Medical College Kottayam.

MATERIAL AND METHODS

Forty eight human hearts were collected from dissection hall of Government Medical College Kottayam, which were preserved in 10% formalin. They were dissected using the routine techniques to expose the course of major coronary arteries. The origin, course and branches of these vessels and the myocardial bridges associated with them were studied.

STATISTICAL ANALYSIS

Tables and graphs were made with the help of Microsoft office 2007. Descriptive statistics like mean and percentages were used to infer results.

RESULTS

48 heart specimens were studied by dissection technique, out of which myocardial bridges were observed in 27 specimens

(56.2%). The left anterior descending artery was involved in 21 cases (43.7%) (Figure-1). The middle segment was also involved in 9 cases (Figure-2). The proximal segment of this vessel was the most common site, 12 cases (Figure-3) (Table-1). The right coronary artery also showed myocardial bridges in 6 cases (21.4%) (Figure-4) (Graph-1). The myocardial bridges is a risk factor for certain surgical interventions like aortocoronary bypasses that affect the anterior interventricular artery, as the submerged portion of artery is only a few millimeters from right ventricle, which is at a risk of perforation during this surgical procedure.

DISCUSSION

It was noticed by Crains cianes² that a segment of left anterior descending artery had an intramyocardial course. In this study, LAD had an intra myocardial course. Geiringer³ observed in 23% the dipping of subepicardial coronary arteries into the myocardium for varying distance known as mural coronaria. This was seen to be 56.2% in our study.

Polacek⁴ described the most frequent location of myocardial bridges is left anterior descending artery especially in its proximal half (60%) and then in oblique branch of left coronary artery (18.5%) which was 25% and 18.75% in our study.

Bloor and Lawman⁵ conducted angiographic visualization of myocardial bridges Noble et al⁶ described the milking effect of myocardial bridges on coronary artery which might reduce the caliber to 75%, a basis for myocardial ischemia.

Fareequi et al⁷ reported two cases of symptomatic myocardial bridging having a milking effect on the vessel. Kramer et al⁸ noticed myocardial bridges in 12% cases of cineangiograms of normal persons.

Irvin and Charleston⁹ reported the prevalence of myocardial bridges in 7.5% to 9.7%, were anterior descending artery of left coronary was the most commonly involved vessel.

Schulle et al¹⁰ reported a case of 46% intramyocardial tunneling of LAD, without any clinical or morphological evidence of myocardial ischemia.

CONCLUSION

The presence of myocardial bridges in such a high number is of importance in the diagnosis, prevention & treatment of Ischaemic Heart Disease.

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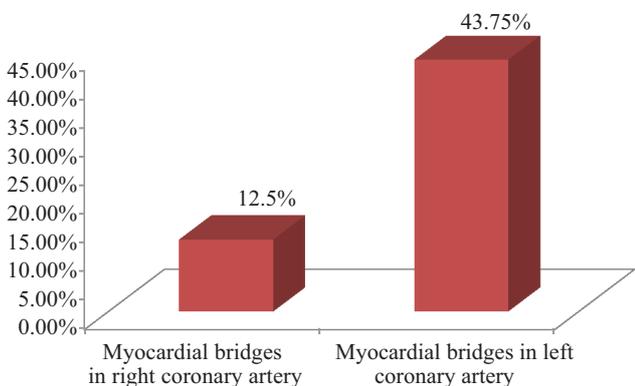
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No. of Heart specimens studied	Myocardial bridges in right coronary artery	Percentage in right coronary artery	Myocardial bridges in left coronary artery	Percentage of MB in left coronary artery
48	6	12.5	21	43.75

Table-1: Percentage of Myocardial bridges on right and left coronary arteries



Graph-1: Percentage of myocardial bridges in coronary artery



Figure-1: Myocardial bridge over the left anterior descending artery; **Figure-2:** Myocardial bridge over the left anterior descending artery.

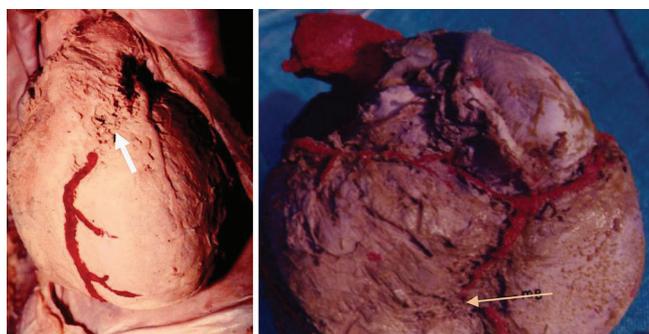


Figure-3: Mural coronary - The proximal part of anterior interventricular artery deeply buried in myocardium; **Figure-4:** Myocardial bridge over posterior interventricular branch of right coronary artery

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Comparative study of Vitamin D and Parathyroid Hormone Status among Fragility Hip Fracture Cases and Elderly Control Subjects in Rajasthan, India

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ABSTRACT

Introduction: Vitamin D deficiency and secondary hyperparathyroidism play central role in pathogenesis of fragility hip fractures among geriatric population. Osteoporosis, osteomalacia, deranged renal profile and poor muscle function lead to brittle bones and frequent falls which together are important in causation of hip fractures. Aim of the study was to characterize and quantify Vitamin D and Parathyroid hormone levels among the elderly patients with fragility hip fractures and apparently healthy controls among patients of Rajasthan state, India.

Material and Methods: 64 elderly (age>60 years) subjects suffering from non-traumatic hip fractures and 64 healthy control subjects included in study and their venous blood samples were analyzed for vitamin D, PTH, alkaline phosphatase and serum calcium levels.

Results: A high prevalence of vitamin D deficiency (90.65%) was found in case group compared to 68.75% among controls. Mean serum 25(OH)D was 12.47±4.52 ng/ml in hip fracture group which was significantly lower than control group levels i.e. 17.57±5.21 ng/dl. Serum PTH (mean±SD) was 62.74±21.05 pg/ml among hip fracture case group which was significantly higher than of control group (44.43±16.07) pg/ml. Serum vitamin D levels correlated negatively with serum PTH levels.

Conclusion: Hypovitaminosis D is prevalent not only among sufferers of fragility fractures but also in general elderly population which might be due to their housebound habitat and poor nutritional supply. In Indian perspective its not possible to screen whole population for vitamin D deficiency, hence routine supplementation of vitamin D for general elderly population is recommended to combat the problem.

Keywords: Fragility fractures, Hip fractures, Osteoporosis, secondary hyperparathyroidism, vitamin D deficiency.

INTRODUCTION

Fragility fractures are major contributor to the burden of public health problem globally. Among these the most common are osteoporotic spine fractures but hip fractures are the most severe ones in terms of morbidity and mortality.¹ Vitamin D deficiency causes osteomalacia in adults particularly among geriatric group due to low sunshine exposure and low dietary intake.^{1,2} Osteomalacia and low calcium nutrition together causes stimulation of parathyroid glands and resultant secondary hyperparathyroidism leading to cortical bone loss which is a major pathway in causation of fragility hip fractures.¹

Vitamin D is synthesized in skin from its precursor 7-dehydrocholesterol under the influence of solar UV-B radiation (290-315nm).³ Some foods also contain vitamin D in low amount e.g. fatty fishes, dairy products, egg. Vitamin

D deficiency among geriatric population is caused by low sunshine exposure and poor nutrition. Previous studies confirm that a low vitamin D level is associated with increased risk of osteoporotic hip fractures.^{4,5} Studies also revealed that prophylactic supplementation of vitamin D causes significant rise in serum vitamin D levels and reduced serum PTH and alkaline phosphatase levels which were previously found to be increased.^{1,6}

Documenting the prevalence of vitamin D deficiency and secondary hyperparathyroidism is of vital importance as a first step in rising awareness among orthopaedic surgeon and further determining a screening and treatment strategy in elderly orthopaedic patients. Reports documenting the incidences of hypovitaminosis D and consequent secondary hyperparathyroidism in elderly orthopaedic patients compared to apparently healthy population are sparse in Indian literature. The purpose of this study is to characterize and quantify Vitamin D and Parathyroid hormone levels among the elderly patients with fragility hip fractures and apparently healthy controls among patients of Rajasthan state, India.

MATERIAL AND METHODS

Study subjects: The present study was conducted at Department of Orthopaedics, SMS Medical college Jaipur Rajasthan India. 64 cases of radiographically proven hip fractures resulting from trivial trauma which comprised of 40 males and 24 female elderly (age>60 years) subjects fulfilling inclusion criteria included in the study and termed case group.

Another study group consists of 64 apparently healthy elderly subjects who attended outpatient department of hospital for non-orthopaedic problems included in study and termed control group.

Inclusion criteria

- Patients giving informed consent to take part in study.
- Patients having hip fracture after trivial trauma with age 60 years or more.

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- Elderly healthy individuals not having hip fracture with age 60 years or more.

Exclusion Criteria

- Polytraumatized patients.
- Patients with history of significant traumatic event.
- Patients with previous history of non-traumatic fracture.
- Patients with age less than 60 years.
- Patients with history of intake of drugs that can affect bone mineral metabolism like systemic steroids, anti-osteoporotic medications, anti-tubercular drugs, anti-epileptic drugs, bisphosphonates, levothyroxine, teriparatide, warfarin, OCPs
- Patients with history of major surgery, prolonged hospitalization or major medical illness within the past one year.
- Patients suffering from major systemic illness like diabetes mellitus, malignancy, hepatic, renal, connective tissue or dermatological, malabsorption, endocrinal disorder.
- Persons taking vitamin or mineral supplementations.
- Patients with a history of hysterectomy/hormone replacement therapy

Ethical Clearance: All good clinical practice (GCP) guidelines were followed. The ethical Review Board approved the study and informed consent was obtained from all patients and control subjects.

Clinical history and examination: A detailed questionnaire regarding name, age, sex, residential address, h/o injury regarding date and mechanism of injury, h/o smoking and alcoholism, occupational status were recorded. Patient's general condition and vitals were assessed and noted. History of past/present medical or surgical illness was noted with detailed note on past/present medical/surgical treatment patient received.

Work Up: From each study subject 10ml of blood sample was drawn without venostasis. The samples were placed in ice boxes. Whole blood was transported under chilled condition to the laboratory in batches. In laboratory serum was separated after centrifugation at 3000 RPM for 15 min at 4°C. After centrifugation the serum was stored in the laboratory freezer at minus 20°C, until further analysis. The venous blood samples for PTH analysis were collected in EDTA plasma collection tubes. Serum 25(OH)D concentrations were estimated by using Enzyme Immunoassay (EIA). Other serum markers measured included total calcium, intact parathyroid hormone (i-PTH) and

alkaline phosphatase.

STATISTICAL ANALYSIS

As shown in table-1, Statistical analysis was performed with the SPSS, trial version 20 for Windows statistical software package (SPSS inc., Chicago, il, USA) and primer. The Categorical data were presented as numbers (percent) and were compared among groups using Chi square test. The quantitative data was expressed as mean \pm SD (Standard Deviation). Differences among the groups were analyzed using the student T Test for parametric data and Mann-Whitney *U* test for the non-parametric. The test of normality was done by Kolmogorov-Smirnov test and skewness and kurtosis statistics According to this, Age and S calcium is non-parametric data. Relationships between variables in the patient group were assessed by using Pearson's correlation coefficient. Significance level was set at $P < 0.05$.

If the sample size is larger than 50, we use the Kolmogorov-Smirnov test. If the sample size were 50 or less, we use the Shapiro-Wilk statistic instead. The test of normality was done by Kolmogorov-Smirnov test. The null hypothesis for the test of normality states that the actual distribution of the variable is equal to the expected distribution, i.e., the variable is normally distributed. Since the probability associated with the test of normality (0.001) is less than the level of significance (0.01), we reject the null hypothesis.

For staging vitamin D deficiency Paul Lips developed a staging system, which takes into account the 3 different parameters-serum 25(OH)D levels, serum PTH levels and bone histology.¹ We stratified the data on the basis of the same.

RESULTS

As shown in table-2, both the groups were comparable regarding age distribution. Mean \pm SD age of the case group and controls groups are 69.63 \pm 6.90 (range 60 to 85 years) and 67.47 \pm 5.768 years (range 60 to 82 years). On application of Chi-square test no significant difference was found between study groups (*P value*=0.064). Most of the subjects belong to 65-69 year of age group in case group (34.38%), while maximum percentage of subjects in control group (32.81%) lied in 60-64 years age slot, a little higher than 65-69 years slot (31.25%).

As depicted in table-3, we stratified the data on vitamin D according to defined by Paul Lips.¹ The percentage of patients and control subjects with hypovitaminosis D according to different cut points were:

GROUP		Kolmogorov-Smirnov ^b			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Age	Case	.150	64	.001	.928	64	.001
	Control	.197	64	.000	.898	64	.000
Vit D(ng/ml)	Case	.090	64	.200*	.969	64	.105
	Control	.068	64	.200*	.990	64	.903
PTH(pg/ml)	Case	.100	64	.189	.960	64	.037
	Control	.071	64	.200*	.979	64	.354
S. Calcium(mg/dl)	Case	.136	64	.005	.927	64	.001
	Control	.184	64	.000	.931	64	.002
S. Alkaline Phosphatase(IU/Lt)	Case	.100	64	.188	.958	64	.030
	Control	.075	64	.200*	.983	64	.500

*This is a lower bound of the true significance.

Table-1: Assessment of variables for Tests of Normality

1. **>30ng/ml** normal or sufficient levels were observed in 0% of the cases while 1.56% controls had the same level of vitamin D.
 2. **20 to 30 ng/ml** Vitamin D insufficient or borderline levels were observed in 9.38 % cases and 29.69 % controls.
 3. **10 to 20 ng/ml** mild deficiency of vitamin D observed in 57.81% of cases and 59.38% of control subjects;
 4. **5 to 10 ng/ml** moderately deficient levels of vitamin D were found in 28.13% cases and 9.38% control subjects.
- 58 out of the total 64 hip fracture cases i.e. a total of 90.65% cases were found to be vitamin D deficient (<20ng/ml) and rest 6 cases were in vitamin D insufficiency range (>30ng/ml). No hip fracture case found to have sufficient serum vitamin D level. 44 out of the total 64 control group (68.75%) were found to be vitamin D deficient, while 19 control subjects (29.69%) were having insufficient levels, and 1 control subject had sufficient serum vitamin D levels. The percentage of patients with severe hypovitaminosis D (<5 ng/ml) among cases was 4.69 %, compared to 0% in the control group.

As shown in table-4, serum 25(OH)D (mean±SD) found to be 12.47±4.52 ng/ml in hip fracture group which is significantly lower than control group levels i.e. 17.57±5.21 ng/dl. (P

value=0.018). As shown in table-5, the Serum PTH (mean±SD) was 62.74±21.05 pg/ml among hip fracture case group significantly higher than of control group which was found to be 44.43±16.07 pg/ml. (P value<0.001).

As shown in table-6, the percentage of cases with abnormally increased serum PTH was more in case group as compared to control group (53.13% vs 14.06%; P Value<0.001) according to mean.

As shown in table-7, serum calcium (mean±SD) was 9.09 ±0.41 mg/dl in hip fracture case group which was significantly higher than in control group level i.e. 8.91±0.32 mg/dl. (P=0.007S)

As shown in table-8 Serum Alkaline Phosphatase (mean±SD) was significantly higher in hip fracture case group (129.27±10.42) than in control group (123.92± 10.78). (P value=0.005)

As depicted in table-9, a significant negative correlation between serum 25(OH)D and PTH existed in the control group (r= -0.636 moderate, P<0.001). A significant negative fair correlation between serum 25(OH)D and S. Alkaline Phosphatase (IU/ Lt) existed in the control group. (r= -0.384, P=0.002). A non-significant positive poor correlation of vitamin D exist with S. Calcium in control group (r= 0.115, P=0.366). A non-significant positive poor correlation of vitamin D exist with age in control group (r= 0.014, P=0.91).

As shown in table-9, a significant negative correlation of serum 25(OH)D exist with PTH (r= -0.696 moderate, P<0.001) and with S. Alkaline Phosphatase (r= -0.274, P=0.029) in the case group. A significant positive poor correlation of vitamin D level exist with S. Calcium (r= -0.269, P=0.032). A non-significant positive poor correlation of vitamin D level exist with age (r= -.078, P=0.542).

As shown in table-10, a non-significant poor negative correlation exists between age and serum PTH level in group B i.e. the elderly subjects without fragility hip fracture.

Age Group	Case		Control		Total	
	No	%	No	%	No	%
60 to 64	13	20.31	21	32.81	34	26.56
65 to 69	22	34.38	20	31.25	42	32.81
70 to 74	10	15.63	13	20.31	23	17.97
75 to 79	9	14.06	7	10.94	16	12.50
≥80	10	15.63	3	4.69	13	10.16
Total	64	100.00	64	100.00	128	100.00

Chi-square = 6.388 with 4 degrees of freedom; P = 0.172

Table-2: Distribution according to age of the cases and control subjects

Vitamin D level	Case		Control		Total	
	No.	%	No.	%	No.	%
<5 ng/ml	3	4.69	0	0.00	3	2.34
10 to 20 ng/ml	37	57.81	38	59.38	75	58.59
5 to 10 ng/ml	18	28.13	6	9.38	24	18.75
20 to 30 ng/ml	6	9.38	19	29.69	25	19.53
>30 ng/ml	0	0.00	1	1.56	1	0.78
Total	64	100	64	100	128	100

Chi-square = 16.773 with 4 degrees of freedom; P = 0.002

Table-3: Distribution of the subjects according to Vitamin D Status

DISCUSSION

In our study it is observed that both the hip fracture group and control group are comparable in terms of age. As evident from our results, Majority of our study subjects were either elderly retired persons or housewives which remain housebound with minimal outdoor activities and least exposure to direct sunlight. We estimated a high prevalence of vitamin D deficiency in both study cohorts however the prevalence of vitamin D deficient subjects was much higher (90.65%) in hip fracture group than in control group (68.75%). The mean serum 25(OH)D

Vitamin D (ng/ml)						
Group	N	Mean	Minimum	Maximum	Std. Deviation	P value LS
Case	64	12.475	4.5	24.5	4.52	
Control	64	17.575	5.8	30.1	5.21	0.018
Total	128	15.025	4.5	30.1	5.49	

Table-4: Vitamin D status among study groups

PTH (pg/ml)						
Group	N	Mean	Minimum	Maximum	Std. Deviation	P-value
Case	64	62.74	26.60	105.00	21.05	<0.001
Control	64	47.43	15.30	85.60	16.07	
Total	128	55.08	15.30	105.00	20.18	

Table-5: Serum PTH status among study groups

(mean±SD) was 12.47±4.52 ng/ml in hip fracture group which is significantly lower than control group levels i.e. 17.57±5.21 ng/dl. These results were in accordance to the previous studies done in Indian population.⁷⁻⁹

When sunshine exposure is not adequate, dietary compensation for vitamin D should occur. Vitamin D intake in the elderly is around 100 IU/d or less in most European countries¹ and much lesser in Asian and southern countries. Fatty fish, such as herring, mackerel and salmon are a very rich source of vitamin D,^{1,2} but are rarely eaten by the elderly in north Indian region. Food in India is not fortified with vitamin D, unlike other countries, for example, margarine in the UK and The Netherlands (usually 3 IU/g) and milk in the US (usually 400 IU/quart). So the dietary supply of vitamin D depends more or less on dairy products in

Indian subjects and adequacy of dietary compensation can only assured when these are taken regularly in balanced diet.

Secondary hyperparathyroidism due to hypovitaminosis D has been proved to be principal mechanism by which means there is cortical bone loss and subsequent fragility fractures. Many investigators have observed increased serum PTH concentrations in elderly people with or without hip fractures associated with vitamin D deficiency.^{1,2,10,11} In our study the mean Serum PTH (mean±SD) was 62.74±21.05 pg/ml among hip fracture case group significantly higher than of control group which was found to be 44.43 ±16.07 pg/ml. More importantly we had 53.13% of the cases with abnormally increased serum PTH in hip fracture case group as compared to only 14.06% in control group according to mean and this difference is also found to be statistically significant which further supports the role of secondary hyperparathyroidism in etiology of non-traumatic hip fractures.

Serum PTH correlated negatively with serum 25(OH)D in many studies,^{1,5,12,13} usually with a correlation coefficient between 0.20 and 0.30. In our study as evident from the results there is a strong negative correlation between serum 25(OH)D levels and PTH in both hip fracture group ($r=-0.696$) and control group ($r=-0.636$) and it was found to be significant statistically. It signifies that in

PTH	Case		Control		Total	
	No	%	No	%	No	%
Increased values	34	53.13	9	14.06	43	33.59
Normal	30	46.88	55	85.94	85	66.41
Total	64	100	64	100	128	100

Chi-square = 20.172 with 1 degree of freedom; P < 0.001

Table-6: Distribution of the subjects according to Serum PTH status

Group	N	S. Calcium (mg/dl)				P value
		Mean	Minimum	Maximum	Std. Deviation	
Case	64	9.09	8.50	10.10	0.41	0.007
Control	64	8.91	8.40	9.80	0.32	
Total	128	9.00	8.40	10.10	0.38	

Table-7: Distribution of the subjects according to Serum Calcium levels

Group	N	S. Alkaline Phosphatase (IU/Lt)				P value
		Mean	Minimum	Maximum	Std. Deviation	
Case	64	129.27	106.00	145.00	10.42	0.005
Control	64	123.92	101.00	147.00	10.78	
Total	128	126.59	101.00	147.00	10.89	

Table-8: Distribution of the subjects according to Serum Alkaline Phosphatase level

Correlations: Case Group					
		Age	PTH (pg/ml)	S. Calcium (mg/dl)	S. Alkaline Phosphatase (IU/Lt)
Vitamin D (ng/ml)	Pearson Correlation	.078	-.696**	.269*	-.274*
	Sig. (2-tailed)	.542	.000	.032	.029
	N	64	64	64	64
Correlations: Control Group					
		AGE	PTH (pg/ml)	S. Calcium (mg/dl)	S. Alkaline Phosphatase (IU/Lt)
Vitamin D (ng/ml)	Pearson Correlation	.014	-.636**	.115	-.384**
	Sig. (2-tailed)	.910	.000	.366	.002
	N	64	64	64	64

Table-9: Correlation of Vitamin D level with age, PTH, S. calcium and S. Alkaline phosphatase

Control	Mean	Std. Deviation	N	R	R Square	Sig. F Change
Age	67.47	5.77	64			
PTH	47.43	16.07	64	-.021 ^a	.000	.872
Case	Mean	Std. Deviation	N	R	R Square	Sig. F Change
Age	69.63	6.80	64			
PTH	62.74	21.05	64	-.176 ^a	.031	.164

Table-10: Correlation between age and S. PTH (control and case group)

geriatric population which frequently suffers from vitamin D deficiency there is consequent stimulation of parathyroid glands resulting into hyperparathyroid state and resultant cortical bone loss which may be severe enough to produce fragility fractures.

Apart from secondary hyperparathyroidism osteomalacia due to deficient vitamin D and resultant unmineralized excessive osteoid tissue (hyperosteoidosis) may be the contributory factor in the causation of fragility fractures. Hyperosteoidosis can be accurately assessed by tetracycline labeled bone biopsy.¹⁴ Because it is not possible for us to administer tetracycline in a fragility fracture patient before fracture happens, so the histological diagnosis of osteomalacia in such patients is not possible. However some investigators used to measure serum alkaline phosphatase levels for assessment of hyperosteoidosis but there may be false positive results.¹⁵ We investigated the study groups with serum alkaline phosphatase and found that the mean serum alkaline phosphatase level was (mean±SD) 129.27 ±10.42 in hip fracture case group significantly higher than in control group (123.92± 10.78 IU/L). While correlating serum alkaline phosphatase levels with 25(OH)D levels there was a significant negative correlation of fair degree among both hip fracture cases and control group subjects which supports there should be an element of hyperosteoidosis in causation of fragility fractures.

Another important cause of hyperparathyroidism in geriatric patients is renal function impairment which may be caused due to hypocalcaemia via feedback mechanism or via direct effect of decreased levels of circulating vitamin D.¹⁶ Hence there is decrease in renal calcitriol synthesis by 1 α hydroxylase and an increased serum PTH levels which counters hypocalcaemic state in early stages of renal failure but all this happens at the price of increased bone turnover. Previous studies suggested decreased glomerular filtration rate with age and gradual increase in serum PTH with age.^{17,18} In our study we correlated serum PTH levels with age data but we failed to find any significant correlation between them among both the case and control study groups.

Since the osteomalacia and secondary hyperparathyroidism are considered the consequences of poor calcium vitamin D nutrition and resultant hypocalcaemia; one can expect a lower serum calcium levels among fragility hip fracture individuals as described by some authors.^{19,20} In our study the mean serum calcium was 9.09 mg/dl in hip fracture case group, and was marginally higher than control group which had a level of 8.91 mg/dl. Though this difference was statistically proven to be significant, but both the values lie in normal range of the serum calcium levels. The elevated levels of calcium among fracture group can be ascribed to the immobilization of patient and resultant mobilization of calcium from the bones.

With all of these considerations the results of our study indicate that the most appropriate 25-hydroxyvitamin D levels for our population should be higher than 30ng/ml. A decrease in serum vitamin D levels either by remaining housebound (hence low sunshine exposure), by decreased oral consumption of vitamin D2 or D3 or by depressed renal functions there may be activation of parathyroids which may lead to excess serum PTH and increased bone turnover and fragile bones. Deficient mineralization and defective skeletal muscle function may result into osteomalacia and frequent falls respectively, which aggravate the problem further. To avoid the above mentioned

consequences we must revise our public health policy for assurance of adequate serum vitamin D levels among Indian population.

The major limitation of our study was that it includes a small sample size with patients either admitted or report to tertiary care centre which may not represent the population at large. Absence of bone mineral density results to support osteoporosis and false positivity among alkaline phosphatase results are other limitations. Further research with large scale population based studies is required to determine the exact correlation between vitamin D, serum PTH, bone histology and myopathy.

CONCLUSION

Our study highlights the high prevalence of hypovitaminosis D among geriatric Indian subjects, either that suffered from fragility hip fracture or apparently healthy. The increased percentage of vitamin D deficient subjects, the significantly reduced mean serum vitamin D levels among fragility fracture case group signifies that hypovitaminosis D is an important risk factor in causation of fragility fractures. Similarly significantly increased mean serum PTH levels and an increased ratio of hyperparathyroid individuals among fracture case group points towards role of secondary hyperparathyroidism among these study subjects. So, it can be concluded that supplementation of vitamin D and fortification of edibles with vitamin D for general population and population at risk might reduce the overall incidences of fragility hip fractures.

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A Study of Surgical Management of Fracture Neck of Femur in Elderly with Bipolar Hemiarthroplasty

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ABSTRACT

Introduction: Femoral injuries are one of the most devastating injuries occurring in a life on an individual. Present study was done with the objective to study the age and sex incidence of fracture neck of femur, quality of life after hemiarthroplasty, morbidity and mortality associated with the procedure, recovery of physical, social and vocational independence and associated complications.

Material and Methods: 67 cases of fracture neck of femur in elderly patients above the age of 50 years treated by hemiarthroplasty using Bipolar endoprosthesis, in the Department of Orthopaedics at Rohilkhand medical college, M.J.P. Rohilkhand University, Bareilly, U.P. between 1st July 2014 to 31st August 2015 were followed up for 6 months and the short term functional results were analyzed by using modified Harris hip scoring system

Results: The age group of patients was 50 to 85 years with mean average age of 63.54 years. Females were predominant. Majority of the fractures were subcapital radiologically. In 68.66 percent cases the mode of injury was trivial trauma. There were 38.33% excellent results and 36.67% good results. Thus 86.67% of the hips were classified as having a satisfactory to excellent results.

Conclusion: Hemiarthroplasty for fracture neck of femur is a good option in elderly patients. Early functional results are good to satisfactory.

Keywords: Bipolar, Hemiarthroplasty, Femoral neck fracture, Elderly

INTRODUCTION

Femoral neck fractures are devastating injuries that most commonly affect the elderly and have a tremendous impact on both the health care system and society in general.

The lifetime risk of sustaining a hip fracture is 40% to 50% in women and 13% to 22% in men. Life expectancy is increasing worldwide, and these demographic changes can be expected to cause the number of hip fractures occurring worldwide to increase from 1.66 million in 1990 to 6.26 million in 2050.¹

The human hip is a weight bearing joint involved in many functions. A successful operation at the hip joint should provide painless, stable hip with wide range of movements.

In modern days the bipolar hip prosthesis is one of the best options, especially the modular bipolar prosthesis with or without cement which can give a very good and active life to the treated patients. An advantage is the modular stem which can be retained in case the patient needs a total hip replacement in future.

This clinical study presents the short term results of prospective randomized trial of bipolar hemiarthroplasty for the treatment of displaced femoral neck fractures in the elderly. Outcomes at 6 weeks, 3 months and 6 months were analyzed by modified Harris hip scoring system and by radiographs taken during follow up.

The functional results were analyzed with the objective, to study the age and sex incidence of fracture neck of femur, quality of life after hemiarthroplasty, morbidity and mortality associated with the procedure, recovery of physical, social and vocational independence and associated complications.

MATERIAL AND METHODS

The present prospective study of 1 year duration included 67 cases of intra-capsular fracture neck of femur in elderly patients above the age of 50 years irrespective of sex and duration of fracture treated by hemiarthroplasty using Bipolar endoprosthesis, in the Department of Orthopaedics at Rohilkhand medical college, M.J.P. Rohilkhand University, Bareilly, U.P. between 1st July 2014 to 31st August 2015. Before the start of the study the clearance was obtained from institutional ethical committee and written informed consent was taken from the subjects.

In all patients preoperatively Buck's traction or Upper tibial steinmann traction as appropriate was done. Oral or parental NSAIDs were given to relieve the pain. Anteroposterior radiographs of the affected hip joint of pelvis with both hips keeping the limbs in 15° internal rotation were taken for all the patients. Routine blood investigations, blood grouping and typing, urine routine, RBS, serum urea, creatinine, HbsAg, HIV, chest x-ray, ECG, were done in all cases. Necessary and adequate treatment was given for those associated with medical problems such as anaemia, diabetes, hypertension, IHD, COPD, asthma, etc. before taking them to surgery.

Surgery was performed under spinal or epidural anaesthesia in lateral position with posterior approach (Moore's Approach).

Whenever necessary, postoperative blood transfusion was given. Intramuscular analgesics were given as per patients compliance, intravenous antibiotics were continued for 4 days. Both the lower limbs kept in abducted position, with a pillow in between both the legs. Drain removal was done after 48 hours. Check radiograph was taken after 48 hours.

Patients were made to sit up on the second day, standup with support (walker), on the third day, and were allowed to full weight bear and walk with the help of a walker on the seventh postoperative day depending on his/her pain tolerance and were encouraged to walk thereafter. Sitting cross-legged and squatting were not allowed.

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Suture removal was done on the 12-14th postoperative day depending on status of wound. The patients were assessed for any shortening or deformities if any and discharged from the hospital.

Patients were followed up at an interval of 6 weeks, 3 months, and 6 months and functional outcome was analysed by modified harris hip scoring system. At each follow up radiograph of the hip was taken for radiological analysis.

STATISTICAL ANALYSIS

Descriptive statistics like mean and percentage were used to infer results. Microsoft excel 2007 was used to make graphs and tables.

RESULTS

Most of the patients were in the age group of 50 - 75 years with the mean age of 63.65 years for males and 63.57 years for females (Graph-1).

Majority (64.18%) of fractures were subcapital type on radiographic examination. Majority (79.31%) of the patients had minimal trauma most of them slipped and fell down on flat ground or in bathroom and were not able to walk or stand. Duration of stay in hospital ranged from 15 to 37 days. 95% of patients had a stay of less than 30 days in hospital (Graph-2).

Apart from 2 deaths, 5 patients were lost to follow up. These 6 patients were excluded from the final results. 2 patients had dyselektrolytemia, 4 patients had superficial infection, 1 patient had an intra-op Greater Tuberosity Fracture, 6 patients had post-op delirium which was controlled by adequate medications and electrolyte correction and 5 patients had pre-operative gluteal bed sores (Graph-3).

38.33 % of patients had no pain during follow up. 48.33 % had slight pain and none had marked pain. 86.66% of patients had none to slight pain in the operated hip whereas mild to moderate pain was noted in about 13.33% of patients. None of subjects had marked pain and had problems with daily activities (Graph-4). 88.33% had none to slight limp. Moderate limp was seen in 11.67 % of the subjects whereas only none of the subjects had severe limp (Graph-5).

In our study Harris hip score, at end of six month ranged from 100 to 41 out of which 38.33% of hemiarthroplasties had hip score of 91-100 (excellent), 36.67% of the hemiarthroplasties had scores of 81-90 (good), 11.67% had satisfactory/ fair results whereas only 13.33% of hemiarthroplasties fell in poor category with scores below 70. Thus 86.67% of the hips were classified as having a satisfactory to excellent results (Table-1).

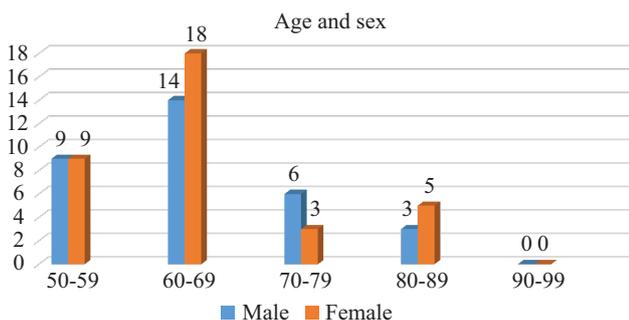
1 patient's x-rays showed radiolucent zone of more than 2 mm at the stem of prosthesis, one patients x-ray showed sclerosis at

tip of prosthesis, 1 patient had neck resorption and 2 patients had subsidence of prosthesis (Table-2).

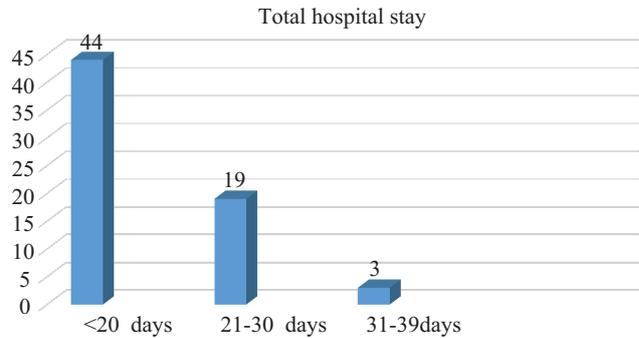
DISCUSSION

In active older patients especially needing early mobilization, primary prosthetic replacement should be considered.

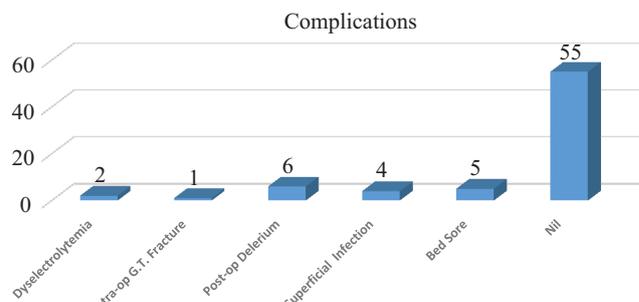
The average age in our patient group was 63.65 years in case of males and 63.57 years in case of females. Majority of the patients were between 50-75 years. Similar age distribution is reported by other authors. Saxena and Saraf² (1978) had age



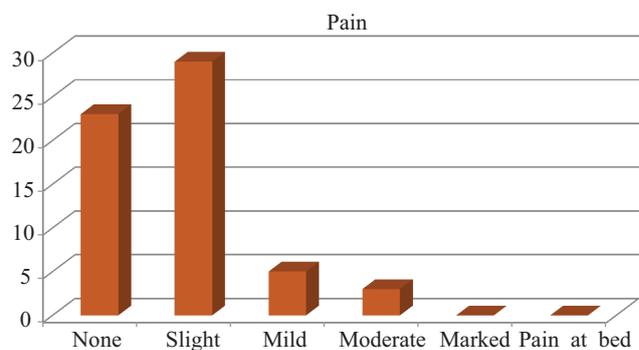
Graph-1: Distribution of sample by age and sex



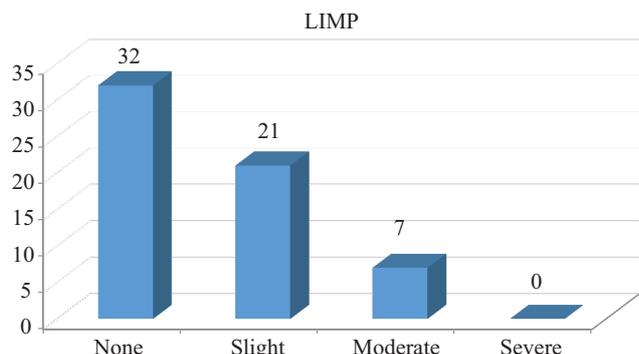
Graph-2: Distribution of the sample by total hospital stay



Graph-3: Distribution of the sample by complications



Graph-4: Distribution of the sample by criteria of pain



Graph-5: Distribution of the sample by Criteria of Limping

Results	Total Harris Hip Score	Frequency	Percentage
Excellent	91-100	23	38.33
Good	81-90	22	36.67
Fair	71-80	7	11.67
Poor	Below 70	8	13.33
Total		60	100

Table-1: Distribution of cases by functional results of bipolar prosthesis at the end of 6 months.

Findings	Frequency
<u>Femoral stem</u>	
1. Radiolucent Zone>2 mm	1
2. Subsidence of prosthesis>5mm	2
3. Sclerosis at the tip of prosthesis	1
<u>Acetabulum</u>	
1. Erosion	0
2. Protrusion	0
Heterotopic Ossification	0
Dislocation / Subluxation	0
Neck Resorption	1
Total	5

Table-2: Distribution of the sample by radiographic results at the end of 6 months



Pre-op X-ray

Post-op X-ray



Standing



Climbing stairs



Sitting cross-legged



Hip in flexion

Figure-1: Functional result - Excellent

distribution 45-90 years (Mean 66 years); Mukherjee and Puri³ (1986) 65 years, Arwade⁴ (1987) 54-86 years with incidence between 70-80 years (Average 72 years).

The type (subcapital or transcervical) or the displacement (Gardens III and IV) are not taken as the criteria to choose the procedure for the management of fracture neck of the femur. The age of the patient Saraf and Saxena² (1978), Mukherjee and Puri³ (1986), Arwade⁴ (1987)] and time since fracture [Boyd and Salvatore⁵ (1964), Salvatti et al⁶ (1974), Sikroski and Barrington (1981), G.S. Kulkarni⁷ (1987)] are taken into consideration while selecting hemiarthroplasty for the management of fracture neck of femur. Bavadekar and Manelkar⁸ (1987), emphasized not to choose hemiarthroplasty in Garden type I and II fractures even in old individuals. We have followed the same philosophy while selecting the patients for hemiarthroplasty.

In our series hospital stay ranges from 15 days to 37 days with a mean average of 19.86 days.

We had no operative deaths in our series. It is observed that the mortality rate varies between 10% to 40% in the western literature. In the Indian series available death rate is not very high. Low mortality is probably due to proper selection of cases. When majority of the deaths in western series were due to cardiac problems, we had only two case with established heart disease who underwent hemiarthroplasty. Low death rate may be also due to proper management of the associated medical problems preoperatively, use of antibiotics routinely and early mobilization.

In our series 4 patient (5.48%) had superficial wound infection. All patients were non- diabetic and 2 were hypertensive. They developed signs of infection in the first week of operation. They were treated with proper antibiotics and dressings. There were no cases of deep infection in our series. All these infections were found when the patients were still in the hospital and this resulted in prolongation of their hospital stay.

The organism isolated in the above cases was: Staphylococcus aureus. Superficial infections can be successfully treated with antibiotics, local measures and drainage. On the other hand, deep infections most of the time need removal of the prosthesis and thorough debridement and lavage. Early deep infections may present as mild low grade pain in the thigh or groin, or as an acute septic shock with potentially fatal clinical course. Salvatti et al⁶ (1974), Moore (1940) and Whittaker (1974)¹¹ have reported extremely high mortality following infection of the prosthesis. Increased incidence of infection has been reported with using posterior Moore's approach for hemiarthroplasty.¹²

We observed that 38.33 % in our series had no pain and 48.33 % of patient had slight pain. 8.33% had mild and 5% had moderate pain but had no post operative complication.

Our good results (75%) (Figure-1) are comparable with other series Hinchey and Day⁹ 72.8%; Lunceford¹⁰ 81%; Anderson and Hamsa 80.3%; Salvatti et al⁶; 57%; Saxena and Saraf²; 90.9%, Mukherjee³ 78%.

CONCLUSION

Hemiarthroplasty for fracture neck of femur is a good option in elderly patients allowing for early mobilization and saving this class of patients from hazards of recumbency for which they are prone. Early functional results are good to satisfactory.

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Isolation of *Acinetobacter baumannii* and its Antimicrobial Resistance Pattern in an Intensive Care Unit (ICU) of a Tertiary Care Hospital

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ABSTRACT

Introduction: *Acinetobacter*, once considered as an opportunistic pathogen has recently emerged as an important nosocomial pathogen worldwide, mostly involving patients with impaired host defenses. Critically ill patients acquire an infection during their stay in Intensive Care Unit (ICU) and the frequency of these infections varies considerably in different populations and clinical setting. The purpose of this study was to know Antimicrobial sensitivity pattern of *A.baumannii* from various clinical samples collected from patients admitted in ICU at Adesh Institute of Medical Sciences and Research, Bathinda, Punjab over a period of one year six months from July 2014 to December 2015.

Material and methods: A total of 48 *A.baumannii* were obtained from 545 samples (8.8%). Antimicrobial susceptibility testing of all *A.baumannii* isolates was done using Kirby Bauer's disc diffusion technique as per recommendations of Clinical Laboratory Standards Institute (CLSI).

Results: Maximum number of *A.baumannii* were isolated from respiratory samples-tracheal aspirate, Endotracheal secretions and sputum (68.7%) followed by pus (12.5%), blood (8.3%), Intercostal drain tube and CSF (4.2%), urine (2.08%). All *A.baumannii* isolates were resistant to ceftazidime and cefepime. Higher level of resistance was also recorded for piperacillin-tazobactam (95.8%) gentamicin and amikacin (93.7%), ciprofloxacin (91.6%), cotrimoxazole (91.6%) ampicillin-sulbactam (75%). Resistance towards imipenem was recorded as 47.9% and meropenem as 58.2%. Minimum resistance was shown towards polymixin B (2.08%) and colistin (4.1%).

Conclusion: *A.baumannii* is emerging as a predominant healthcare associated multidrug resistant pathogen, especially in the ICU's. The findings of this study will help our clinicians to apply adequate antibiotics for treatment of patients admitted in ICU.

Keywords: *A.baumannii*, Intensive Care Unit (ICU), respiratory samples, antimicrobial resistance

INTRODUCTION

Members of Genus *Acinetobacter* have emerged as organisms of questionable pathogenicity and pan resistant nosocomial pathogens worldwide in past two or three decades; especially since 2005-2006.¹ Critically ill patients acquire an infection during their stay in an Intensive care unit (ICU) and the frequency of these infections varies considerably in different populations in clinical settings.^{2,3} The increased risk of infection is associated with severity of patient's illness, length of exposure to invasive and procedures, increased patient contact with healthcare personnel and length of stay in ICU.⁴ It can colonise the respiratory, urinary and gastrointestinal tract and wounds of patients and can cause infections in burn, trauma, mechanically ventilated and immune compromised patients as it shows a special predilection for ICU.⁵ There are many species in this

genus but only three species i.e - *A.baumannii*, *A.calcoaceticus* and *A.lwoffii* appear to be of clinical importance. These species have been included under the term *A.calcoaceticus-A.baumannii* complex and are usually reported as *Acinetobacter*.^{6,7} Outbreaks of *Acinetobacter* are linked to contaminated respiratory equipment, intravascular access devices, bedding materials and transmission via hands of hospital personnel.⁸ An increase in antibiotic resistance among the isolates of organism during recent years, has made these infections difficult to treat.⁹ The resistance mechanisms of *Acinetobacter* are multiple. They include production of beta lactamases, alterations in cell wall channels and efflux pumps by which it becomes resistant to beta-lactam antibiotics, production of aminoglycoside modifying enzymes and mutations in genes *gyrA* and *parC* mediate resistance to aminoglycosides and quinolones respectively.¹⁰ The success of antimicrobial therapy depends upon the appropriateness of choice of antibiotics that should be used prior on basis of prior knowledge of susceptibility pattern of the agent. Therefore, the purpose of the study was to examine antimicrobial sensitivity pattern of *A.baumannii* isolates obtained from various clinical samples collected from patients admitted in ICU at Adesh Institute of Medical Sciences and Research, Bathinda over a period of one year six months, from July 2014 to December 2015

MATERIAL AND METHODS

A total of 545 clinical samples which included Tracheal aspirate, Endotracheal secretions, sputum, urine, blood, pus, intercostal drain tubes, CSF were collected from patients admitted in ICU of AIMSR, Bathinda after getting clearance from the Institutional Ethics Committee of AIMSR. The samples were collected from patients of all age groups, both sexes, who were critically ill and suspected for pneumonia, urinary tract infection, septicaemia, skin and soft tissue infection and meningitis. The samples were inoculated on Blood Agar and MacConkey Agar plates under strict aseptic conditions. Plates were incubated at 37C for 24-48 hrs. *A.baumannii* was identified and confirmed by Gram

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staining as Gram negative cocci or coccobacilli in pairs, non-motile, oxidase negative, Alkaline/Alkaline (K/K) reaction in Triple sugar Iron (TSI) slant, catalase positive, Indole negative,

Samples	Total number processed	Positive for <i>A.baumannii</i>
Tracheal aspirate	98	16
Endotracheal secretions	83	13
Sputum	23	4
Urine	162	1
Blood	146	4
Pus	17	6
Intercostal drain tubes	6	2
CSF	10	2
Total	545	48

Table-1: *Acinetobacter baumannii* isolates from various samples

Specimen	<i>A.baumannii</i> isolated (%)
Tracheal aspirate	16 (33.3%)
Endotracheal secretions	13 (27.08%)
Sputum	4 (8.3%)
Urine	1 (2.08%)
Blood	4 (8.3%)
Pus	6 (12.5%)
Intercostal drain tubes	2 (4.2%)
CSF	2 (4.2%)

Table-2: Number of *A.baumannii* isolated from various samples

Antimicrobial agent	Sensitive n (%)	Resistant n (%)
Ceftazidime	0 (0%)	48 (100%)
Cefepime	0 (0%)	48 (100%)
Ampicillin-sulbactam	12 (25%)	36 (75%)
Imipenem	25 (52.1%)	23 (47.9%)
Meropenem	21.8 (43.8%)	27 (58.2%)
Piperacillin-tazobactam	2 (4.2%)	46 (95.8%)
Cotrimoxazole	4 (8.4%)	44 (91.6%)
Ciprofloxacin	4 (8.4%)	44 (91.6%)
Gentamicin	3 (6.3%)	45 (93.7%)
Amikacin	3 (6.3%)	45 (93.7%)
PolymixinB	47 (97.9%)	1 (2.1%)
Colistin	46 (95.8%)	2 (4.2%)

Table-3: Sensitivity pattern of *A.baumannii* to different antimicrobial agents (N=48)

Name of Antibiotic	Tracheal aspirate (16)	ET secretion (13)	Sputum (4)	Urine (1)	Blood (4)	Pus (6)	ICD tube (2)	CSF (2)
Ceftazidime	16 (100%)	13 (100%)	4 (100%)	1 (100%)	4 (100%)	6 (100%)	2 (100%)	2 (100%)
Cefepime	16 (100%)	13 (100%)	4 (100%)	1 (100%)	4 (100%)	6 (100%)	2 (100%)	2 (100%)
Ampicillin-sulbactam	12 (75%)	8 (61.5%)	4 (100%)	1 (100%)	2 (50%)	5 (83.3%)	2 (100%)	2 (100%)
Imipenem	7 (43.7%)	4 (30.7%)	3 (75%)	0 (0%)	2 (50%)	5 (83.3%)	2 (100%)	2 (100%)
Meropenem	10 (62.5%)	6 (46.1%)	3 (75%)	0 (0%)	2 (50%)	2 (33.3%)	2 (100%)	2 (100%)
Piperacillin-tazobactam	15 (93.7%)	13 (100%)	4 (100%)	0 (0%)	4 (100%)	6 (100%)	2 (100%)	2 (100%)
Cotrimoxazole	16 (100%)	11 (84.6%)	4 (100%)	1 (100%)	2 (50%)	6 (100%)	2 (100%)	2 (100%)
Ciprofloxacin	14 (87.5%)	12 (92.3%)	4 (100%)	0 (0%)	4 (100%)	6 (100%)	2 (100%)	2 (100%)
Gentamicin	16 (100%)	12 (92.3%)	4 (100%)	1 (100%)	2 (50%)	6 (100%)	2 (100%)	2 (100%)
Amikacin	16 (100%)	12 (92.3%)	4 (100%)	1 (100%)	2 (50%)	6 (100%)	2 (100%)	2 (100%)
Polymixin B	1 (6.25%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Colistin	2 (12.5%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

Table-4: Antibiotic resistance pattern of *A.baumannii* isolated from different sites of infection

Citrate utilization test positive, Nitrate reductase negative, urease test negative. It showed Oxidative –Fermentative (O/F) test –oxidative and growth at 44 C.^{11,12}

Antimicrobial susceptibility testing of all *A.baumannii* isolates was done using Kirby Bauer disc diffusion technique as per recommendations of Clinical Laboratory Standards (CLSI).^{13,14} Antimicrobial discs used for sensitivity testing were- ceftazidime (30 µg), cefepime (30 µg), piperacillin-tazobactam (100µg)/10 µg), Ampicillin-sulbactam (10 µg)/10 µg), Imipenem (10 µg), Meropenem (10 µg), Gentamicin (10 µg), Amikacin (30 µg), Cotrimoxazole (25 µg), Ciprofloxacin (5 µg), Norfloxacin (30 µg), PolymixinB (300 units) and Colistin. (10 µg). All dehydrated media and antimicrobial discs were procured from Hi Media Labs, Mumbai, India.

STATISTICAL ANALYSIS

Statistical analysis was done by descriptive statistics using simple ratio and percentages method. Microsoft office 2007 was used to generate Tables.

RESULTS

A total of 48 *A.baumannii* isolates were obtained from total 545 samples collected from ICU patients (Table-1).

Maximum number of *A.baumannii* were isolated from respiratory samples-tracheal aspirate, ET secretions and sputum (68.7%) followed by pus (12.5%), blood (8.3%), Intercostal drain tube and CSF (4.2%), urine (2.08%) (Table-2).

All *A.baumannii* isolates were resistant to ceftazidime and cefepime. Higher level of resistance was also recorded for piperacillin-tazobactam (95.8%), gentamicin and amikacin (93.7%), ciprofloxacin (91.6%), cotrimoxazole (91.6%) ampicillin-sulbactam (75%). Resistance towards imipenem was recorded as 47.9% and meropenem as 58.2%. Minimum resistance was shown towards polymixin B (2.08%) and colistin (4.1%) (Table-3) (Table-4).

DISCUSSION

In the present study, 8.8% (48/545) *A.baumannii* isolates were obtained from different ICU samples. In India, *A.baumannii* is reported to cause about 13.2% of nosocomial infections in ICU patients.¹⁵ In our study, respiratory samples showed *A.baumannii* (68.75%) as compared to non-respiratory samples. This study is in concordance with a study by Jaggi et al who

reported isolation rate of *A.baumannii* in respiratory samples as 59.6%.⁵

Very low isolation rate was reported from urine samples (2.08%). The results are almost similar to Jaggi et al⁵ and Nahar et al⁴ who reported it as 2.9% and 3.1% respectively. This shows that *A.baumannii* shows relatively low prevalence in causing UTI. Siau et al¹⁶ reported that respiratory tract was the most common site from where *A.baumannii* was isolated in ICU patients. Villers et al¹⁷ have also reported a predominance of *A.baumannii* in tracheobronchial secretions from 24.8% to 48.8% and Suri et al¹⁸ as 45.6% in their studies respectively. This study showed *A.baumannii* was extremely resistant to all routinely used antibiotics in the ICU. Many Indian studies have reported high level of resistance in Acinetobacters. Most isolates were from critical care setting and source was most often respiratory samples.¹⁹ In a study by Nahar et al 100% resistance was recorded towards amoxicillin, ceftriaxone, cefuroxime and gentamicin. Higher level of resistance was recorded was amikacin (68.4%) and Imipenem (66.7%) but lower level of resistance was shown in colistin (10.5%).⁴ Rahbar et al also reported high level of resistance towards Piperacillin-tazobactam (90.9%), ceftriaxone (90.9%), ceftazidime (84.1%) and ciprofloxacin (90.9%).²⁰ In another study by Shakibaie et al, they found that many isolates of Acinetobacter were resistant to almost all antibiotics routinely used in the ICU of their hospital.²¹ The high resistance pattern seen in our isolates may be related to selective pressure of extensive usage of third generation cephalosporins. It has also been observed that Acinetobacter can develop resistance when the patient is on treatment. In case of pan drug resistant Acinetobacter infections, alternative antibiotics available are colistin, polymixin B and tigecycline.¹⁰

CONCLUSION

The high proportion of antibiotic use in our ICU's might explain the high resistance observed in *A.baumannii*. Rational use of antibiotics is necessary to prevent microbial resistance catastrophe. The major mode of transmission from patient to patient is the contaminated hands of health care workers (HCW's). Therefore, improving hand hygiene compliance among HCW's and standard precautions may be adequate to control multidrug resistant ICU bugs in endemic settings. The findings of this study will help our clinicians to apply adequate antibiotics for treatment of patients admitted in ICU.

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Prevalence and Epidemiology of Undernutrition among Preschool Children in A Selected Area

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ABSTRACT

Introduction: Under nutrition is still the major problem in our country. Since young children are vulnerable to social and health hazards which can influence their growth and development, they deserve special attention by administration, general population and the family. Hence the present was undertaken to study the prevalence of under-nutrition among the pre-school children and to suggest measures for prevention and control.

Material and Methods: A cross sectional study was conducted among pre-school children in a selected area of Ranga Reddy District over one year with the objectives to find out the prevalence of under-nutrition, determine association with socio-demographic factors and with some epidemiological factors and suggest measures for prevention and control of under nutrition based on finding.

Results: A total of 592 pre-school children aged 2-5 years were selected. Among the study population prevalence of under nutrition was 48.2%, 158 (26.69%) were under weight and 128 (21.62%) were severely under weight. Proportion of under nutrition was higher in 49-60 months, Hindu children (52.62%), class IV socio-economic-status(61.11%) and children from nuclear families, with illiterate mothers (52.84%), employed mothers (66.67%), illiterate fathers(54.27%), unemployed fathers (58.33%), family size of 4 or more (62.69%), birth spacing < 3 years(50.74%), prelacteal fed babies (55.40 %), not exclusive breast fed(55.05%), weaning delayed >10 months (60.25%) and unimmunized children (73.33%).

Conclusion: It was observed that 48.2% of the children were undernourished more in above 36 months of age, Hindus and class IV. Parent's literacy, socio-economic status and family size had an impact on nutritional status of children besides faulty feeding practices, partial immunization, frequent diarrhea.

Keywords: Prevalence and Epidemiology, Undernutrition Children

INTRODUCTION

The preschoolers (2-5 years) are at the greatest risk of malnutrition because of the fact that growing period demands high intake of proteins and calories.¹

The nutritional problems are multifactorial with its roots in the sectors of education, demography, agriculture and development.² Most common causes of under nutrition include faulty infant feeding practices, impaired utilization of nutrients due to infections and parasites, poor immunization status, inadequate food and health security, poor environmental conditions and lack of proper child care practices.³ Under nutrition during the critical phases of early growth, can lead not only to the stunting of physical growth, but also to sub-optimal intellectual development and poor neuro integrative competence in children.⁴

Under nutrition is still the major problem in our country. According to NFHS 3 (2005-2006) 43% of the children

fewer than 5 years of age are underweight, 48% are stunted and 20% are wasted.⁵ Since young children are vulnerable to social and health hazards which can influence their growth and development, they deserve special attention by administration, general population and the family.⁶

Considering the above, the present study was undertaken to assess the nutritional status of pre-school children in a selected area of Peerancheruvu of Ranga Reddy District and status of immunization, feeding practices and family size in them.

Aim and objectives of the study were to study the prevalence of under-nutrition among the pre-school children to determine association of socio-demographic factors with under nutrition, to study association of nutritional status with some epidemiological factors and to suggest measures for prevention and control of under-nutrition based on finding of study

MATERIAL AND METHODS

The Study design was a Cross Sectional Study undertaken in Peerancheruvu of Ranga Reddy District over a one year (October 2013 to September 2014) in Pre-school children (2-5years)

Inclusion criteria: Pre-school children residing in the given area for more than 1 year.

Exclusion criteria: Parents not cooperating on frequent visits.

Estimation of sample size: Sample size was calculated using the formula $n = 4pq/L^2$ where 'p' is probability of occurrence 'q' probability of non occurrence and L is allowable error. Using prevalence of under-nutrition around 48% taking national average² and allowable error at 10%, the sample size was calculated to be 434 children. A 30% margin was added to allow for a maximum estimated non-response, giving a sample size of 564 subjects.

Pilot study: A pilot study was undertaken for assessing feasibility and finalization of proforma, on 50 respondent's. Necessary modifications were made after analyzing responses. The proforma was then finalized keeping in mind the objectives and variables of the study. Approval of Ethical committee of Shadan Institute of Medical Sciences was obtained. Data was collected by interviewing parents or caretakers using semi structured; predesigned and pretested proforma in respective anganwadi centers as well as house-to-house visit of those selected children. This was with consent of parents.

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STATISTICAL ANALYSIS

Data thus obtained was coded and entered into Microsoft excel worksheet. Data was analyzed using Epi info version 7. The frequency distribution of the study subjects according to age, sex, religion, educational status, occupation of their parents, socioeconomic status and other study variables were analyzed. Prevalence of under nutrition was estimated. Relation between under nutrition and major socio-demographic factors such as age, sex, religion, educational status of parents, socioeconomic status and other study factors was estimated. The association of under nutrition with the above factors was found by chi-square test. The statistical significance was evaluated at 5% level of significance.

RESULTS

Prevalence of undernutrition in pre-school children:

Prevalence of under nutrition was 286 (48.31%). Out of 592 children 158 (26.69%) were under weight and 128 (21.62%) were severely under weight.

Distribution of pre-school children according to age group and nutritional status (Table-1) $\chi^2 = 42.1262$, df 5, p= 0.000

Maximum children i.e. 241 each were present in 37-48 months age groups. Maximum proportion of under nourished children were in the age group of 49-60 months i.e. 109(52.91%) followed by 98(40.66%) in 37-48 months and least proportion in 25-36 months i.e. 49(33.79%). This difference was statistically highly significant.

Distribution of pre-school children according to sex and nutritional status $\chi^2 = 0.3515$, df 1, p= 0.5530

Higher number of girls i.e. 320 was seen in the study. It was observed that 169(52.81%) of the girls and 137(50.37%) of the boys were normal. Among the undernourished maximum number were boys i.e. 135(49.63%). No significant difference was observed between boys and girls as far as under nutrition is concerned (p < 0.05)

Distribution of pre-school children according to religion and nutritional status $\chi^2 = 7.521$, df 1, p= 0.006

Majority of the children i.e. 382 were Hindu. Proportion of underweight children was maximum among Hindu children i.e. 201(52.62%) and 84(40.19%) among Muslim and consisted of only one Christian child who was normal. This difference was statistically significant.

Age in months	Undernutrition	Normal	Total
25-36	49(33.79%)	96(66.21%)	145 (100%)
37-48	98(40.66%)	143(59.34%)	241(100%)
49 – 60	109(52.91%)	97(47.09%)	206(100%)
Total	286(48.31%)	306 (51.69%)	592(100%)

Table-1: Distribution of pre-school children according to age group and nutritional status

Education of the mother		Undernutrition	Normal	Total
Illiterate		149(52.84%)	133(47.16%)	282(100%)
Literate	Primary /Middle school	52(45.61%)	62(54.39%)	114(100%)
	High school /Secondary	74(44.05%)	94(55.95%)	168(100%)
	Degree/Pg/honours	11(39.29%)	17(60.71%)	28(100%)
Total		286(48.31%)	306 (51.68%)	592(100%)

Table-2: Distribution of pre-school children according to education of the mother and nutritional status

Distribution of pre-school children according to socio economic class and nutritional status $\chi^2 = 5.9429$, df 3, p= 0.1144. Majority of the children i.e.335 (56.59%) belonged to class IV followed by 172 (29.05%) in class III and no children were found in class I, according to modified kuppaswamy classification. Proportion of under nutrition was highest i.e. 11(61.11%) among children who belonged to class V socio-economic-status followed by class III and class IV, where as lowest i.e. 24 (35.82%) in children belonging to class II category.

Distribution of pre-school children according to type of family and nutritional status $\chi^2 = 2.0796$, df 2, p = 0.3535.

In the present study 302 (51.01%) belonged to nuclear type of family followed by 233 (39.36%) from Joint family and least i.e. 57 (9.63%) belonged to three generation families. Proportion of underweight was higher among children from three generation families and nuclear families i.e. 29(50.88 %) and 153(50.66 %) respectively, compared to 104(44.64 %) children from joint families.

Distribution of pre-school children according to education of the mother and nutritional status Table-2: $\chi^2 = 4.7814$, df 3, p = 0.1885

Majority of the mothers i.e. 282 were illiterate. The proportion of underweight children was maximum i.e. 149(52.84%) among children of illiterate others and was least i.e.11 (39.29%) among children of literate mothers who had graduate or post graduate degree. This difference was not statistically significant.

Distribution of pre-school children according to occupation status of the mother and nutritional status: Mothers

employed in semi professional/ professional occupations i.e. teachers or lectures had high proportion of children being under weight i.e. 4(66.67%) followed by mothers employed in unskilled /semiskilled mainly as laborers or domestic servants 49(62.03%). This difference was not statistically significant.

Distribution of pre-school children according to education of the father and nutritional status $\chi^2 = 7.826$, df 3, p = 0.0497.

Most of the fathers of study population were illiterates i.e. 234 (39.53%). Maximum number of under nutrition children 127 (54.27%) had illiterate fathers compared to maximum number of normal children 122(58.94%) whose fathers had completed high school or secondary education. This difference was statistically significant.

Distribution of pre-school children according to occupation of the father and nutritional status $\chi^2 = 6.114$, df 3, p = 0.1062

Majority of the fathers were involved in unskilled occupation or semiskilled occupation like laborers or vendors i.e. 356 (60.13%). Unemployed fathers had a higher proportion of undernourished children 7(58.33%); followed by fathers involved in unskilled /semiskilled work 183(51.4%). Fathers involved in semi professional/ professional occupation had

Weaning age in months	Undernutrition	Normal	Total	
<6	19(47.50%)	21 (52.5%)	40(100%)	
6 - <10	107(41.47%)	151(58.53%)	258(100%)	$\chi^2 = 0.515$, $p = 0.4727$
> 10	144(60.25%)	95(39.75%)	239(100%)	$\chi^2 = 17.5014$, $p = 0.0000$
Total	270	267	537* (100%)	

Table-3: Distribution of pre-school children according to weaning practice and nutritional status.

Clinical sign		Frequency	Percent
General appearance	Thin	71	11.99
	Lack of lusture	20	3.37
Hair	Dyspigmented	1	0.17
	Thin and sparse	14	2.36
	Diffuse depigmentation	40	6.75
Face	Moon face	1	0.17
	Brown pigmentation	1	0.17
Eyes	Pale conjunctiva	118	19.93
	Pale and flabby	97	16.38
Tongue	Geographic	5	0.84
	Mottled enamel	1	0.17
Teeth	Caries	83	14.02
	Dry and scaly	60	10.13
Skin	Follicular hyperkeratosis	1	0.17

Table-4: Distribution of pre-school children according to clinical signs of undernutrition (n=592)

maximum proportion of normal children 7(77.78%). This difference among the various groups was not statistically significant.

Distribution of pre-school children according to family size and nutritional status: Majority i.e. 243(41.04%) of the families had a family size of two. Proportion of under nutrition was maximum i.e. 42(62.69%) when family size was 4 or more and least i.e. 65(43.33%) when family size was one. This difference was not statistically significant.

Distribution of pre-school children according to birth order and nutritional status. $\chi^2 = 4.4058$, df 3, $p = 0.2209$. Proportion of under nutrition was least in children with birth order two, i.e. 87(43.17%) and was found to be high in children with birth order three i.e. 49(55.68%). This difference was not statistically significant.

Distribution of pre-school children according to birth spacing and nutritional status. $\chi^2 = 1.7059$, df 1, $p = 0.191$ *n=343. As children with birth order one were excluded. Maximum proportion of under nutrition i.e. 103(50.74%) was seen in children in whom birth spacing was less than 3 years compared to 61(43.57%) in whom birth spacing was 3 or > 3 years. This difference was not statistically significant.

Distribution of pre-school children according to prelacteal feeding and nutritional status: $\chi^2 = 18.6281$, df 1, $p = 0.00001$ In the present study 361(60.97%) children had been fed with prelacteal feeds. Proportion of under nutrition was higher among children who had received prelacteal feeds 200 (55.40 %). This difference was statistically highly significant.

Distribution of pre-school children according to exclusive breast feeding practice and nutritional status $\chi^2 = 18.7602$,

df 1, $p = 0.00001$ Out of 592 children 216(36.4%) children were exclusively breast feed. Majority i.e. 137 (63.43%) of the children were normal in whom exclusive breast feeding was practiced and 79(36.57%) were under nutrition. Among the children in whom exclusive breast feeding was not practiced 207(55.05%) were under nutrition and 169(44.95%) were normal. This difference was statistically highly significant.

Distribution of pre-school children according to weaning practice and nutritional status (Table-3): *n=537. A children <6 months in whom weaning was not initiated were excluded. Maximum number of children i.e. 151(58.53%) were normal if weaning was done at 6-9 months. Maximum number of children in whom weaning was delayed upto 10 or more months i.e. 144(60.25%) were under nutrition. The difference was statistically significant.

Distribution of pre-school children according to immunization practice and nutritional status: $\chi^2 = 4.061$, df 2, $p = 0.131$. Out of the 548 fully immunized for age children a maximum i.e. 288 (52.55%) were normal. Maximum i.e. 11(73.33 %) of the unimmunized children were undernutrition. This difference was not statistically significant.

Distribution of pre-school children according to clinical signs of undernutrition Table-4: (n=592) In the present study among the different clinical features of undernutrition maximum number of children i.e. 118 (19.93%) had pale conjunctiva, 83(14.02%) had caries, 71 (11.99%) had a thin general appearance and 60 (10.13%) had dry and scaly skin.

Distribution of pre-school children according to past medical illness (n=592) Among children who had illness in the last one year maximum children i.e. 54 (9.12%) had diarrhea, 53(8.95%) had acute respiratory infection.

DISCUSSION

In the present study prevalence of under nutrition was 48.31%. This findings were more or less similar with Sable Rupali et al (2012)⁷ 51.8%, Gholamreza Sharifzadeh et al (2010)⁸ 47.3%, S Bisai K et al (2008)⁹ 50.00%, Jakhar et al (2011)¹⁰ 58.3 %, M. K. Goel et al² 57.4%. Few studies showed a higher prevalence then the present study namely RN Mishra et al (2001)¹¹ 75%, Munesh Kumar Sharma, et al (2011)¹² 72.5%, Shally Awasthi et al (2003)¹³ 67.3%. According to Paramita Sengupta et al (2010)¹⁴ 29.5 %, Nguyen Ngoc Hien et al (2008)¹⁵ 31.8% were undernourished.

Table-1 shows distribution of pre-school children according to age group and nutritional status that maximum proportion of undernourished children were in the age group of 49-60 months i.e. 109(52.91%) followed by 98(40.66%)in 37-48 months and least proportion in 25-36 months i.e. 49(33.79%). This difference was statistically highly significant. High proportion

in the age group of 49 - 60 months may be due to various factors like low socio economic status, low education of parents and low awareness of parent's regarding growing children and their nutritional requirement and other factors like food fads and food taboos and various cultural factors. These findings are in confirmation with Anjali B et al in (2012)³², Paramita Sengupta et al (2010)¹⁴, M. K. Goel et al (2007)² While these findings are not in confirmation with Bhatia et al (2007)¹⁶ which revealed the peak prevalence of under nutrition in the age group of 6–12 months, Prema Ramachandran et al (2009)¹⁷ between 3-23 months, Bloss Emily et al (2004)²⁸ and Ray SK et al(2001)¹⁸ where higher prevalence was in <2yr children which was statistically significant, Deeksha Kapoor et al (2005)¹⁹ found higher under nutrition in the age group of 9-36 months. Bisai K et al (2008)²¹ and Tripathi MS (2006)²¹ showed that higher prevalence of underweight was seen in preschool children compared to school going children.

169 (52.81%) of the girls and 137 (50.37%) of the boys were normal. Among the undernourished maximum number were boys i.e. 135 (49.63%). This difference was not statistically significant. Study done by M. K. Goel et al² also showed no statistical significance of undernourishment in gender. These findings are in confirmation with Bhatia et al.¹⁶ These findings are not in confirmation with Paramita Sengupta et al (2010)¹⁴ S. Biswas et al (2009),²² Dey et al (2008)²³, Shally Awasthi et al¹³ Anjali B et al³² which showed that female children were at the high risk of being under-nourished.

Proportion of undernutrition was maximum among Hindu children i.e. 201 (52.62%) and 85 (40.67%) among Muslim children. This difference was statistically significant. These findings are not in confirmation with I Dey et al (2008)⁴² which found high prevalence in both Hindus and Muslims. Among both, Muslims had a higher proportion of under nutrition children but the difference was not significant.

The proportion of under nutrition was highest i.e. 11(61.11%) among children who belonged to class V socio-economic-status, where as lowest i.e. 24 (35.82%) in children belonging to Class II category. These findings are in confirmation with Munesh Kumar Sharma et al (2011)¹², Harishankar et al (2004)²⁴

It was observed that 302 (51.01%) belonged to nuclear type of family followed by 233 (39.36%) from joint family and least i.e. 57 (9.63%) belonged to three generation. Proportion of under nutrition was higher among children from three generation families and nuclear families i.e. 29(50.88 %) and 153(50.66 %) respectively compared to 104 (44.64 %) children from joint families. These findings are in confirmation with Srivastava Anurag, et al (2012)²⁵ Megha Luthra et al (2009).²⁶ A cross-sectional study done by M. K. Goel et al² revealed that undernourishment was influenced by type of family. Kumkum kumara et al (2007)²⁷ revealed that there was no significant difference between type of family and undernutrition ($p>0.05$). The proportion of under nutrition was maximum i.e. 149 (52.84%) among children of illiterate mothers and was least i.e.11 (39.29%) among children of literate mothers who had graduate or post graduate degree or had done honors (Table-2). This difference was not statistically significant. These findings are in confirmation with Anjali B et al in³² Jakhar et al (2011)¹⁰, Paramita Sengupta, et al¹⁴, by Nguyen Ngoc Hien et al¹⁵, by M. K. Goel et al.²

Maximum numbers of the mothers of study population were housewife i.e. 486 (82.09%). Children of mothers employed in semi professional/ professional occupation had high proportion of being under nutrition i.e. 4(66.67%) followed by mothers employed in unskilled /semiskilled 49(62.03%). This difference was not statistically significant. These findings are in confirmation with Gholamreza Sharifzadeh et al⁸, Nguyen Ngoc Hien et al¹⁵, Sabu S Padmadas et al.³¹

Most of the fathers of study population were illiterates i.e. 234 (39.53%). Maximum number of under nutrition children 127(54.27%) had illiterate fathers compared to maximum number of normal children 122(58.94%) whose fathers had completed high school or secondary education. This difference was statistically significant. These findings are in confirmation with Gholamreza Sharifzadeh et al⁸, and Ray SK et al (2000).¹⁸ These findings are not in confirmation with Bloss Emily et al²⁸ which showed neither underweight nor stunting was associated with father's literacy status.

Majority of the fathers were involved in unskilled occupation or semiskilled occupation i.e. 356 (60.13%). Unemployed fathers had a higher proportion of under nutrition children 7(58.33%); followed by fathers involved in unskilled /semiskilled work 183(51.4%). Fathers involved in semi professional/ professional occupation had maximum proportion of normal children 7(77.78%). This difference among the various groups was not statistically significant. Paramita Sengupta et al¹⁴ and Swami HM et al (2000)²⁹ found statistically significant association of being under-nourished and having unskilled laborer father.

It was observed that proportion of under nutrition was maximum i.e. 42 (62.69%) when family size was 4 or more and least i.e. 65(43.33%) when family size was one. These findings were in consideration with Bloss Emily et al²⁸ and Swami HM et al²⁹ which revealed that with increase in family size, the prevalence of malnutrition also significantly increased.

Proportion of under nutrition was least in children with birth order two and was found to be high in children with birth order three. Though this difference was not statistically significant, these findings were in confirmation with M. K. Goel et al², Harishankar et al²⁵ which revealed that undernourishment increases with birth order.

Maximum proportion of under nutrition was seen in children in whom birth spacing was less than 3 years compared to birth spacing 3 or > 3 years. This difference was not significant statistically. Paramita Sengupta et al²⁴ revealed significant association of higher malnutrition in children with low birth interval. In the present study 60.97% children had been fed with prelacteal feeds. Proportion of under nutrition was higher among children who had received prelacteal feeds. This difference was statistically significant and were in confirmation with and Megha Luthra et al²⁶

Out of 592 children majority (63.43%) of the children were normal in whom exclusive breast feeding was practiced. Among the children in whom exclusive breast feeding was not practiced 55.05% were under nutrition. This difference was statistically significant. These findings were in confirmation with Paramita Sengupta et al²⁴, Nguyen Ngoc Hien et al.¹⁵ In 2007 Braja Kishori et al³⁰ showed that the higher prevalence of malnutrition was observed among children who were exclusively breast-fed beyond six months.

Maximum number of children (58.53%) were normal if weaning was done at 6-9 months (Table-3). Further it was observed that a maximum number of children in whom weaning was delayed up to 10 or more i.e. (60.25%) were under nutrition. The difference was statistically significant and findings were in confirmation with by Braja Kishori et al³⁰, Sabu S Padmadas et al.³¹

Out of the 548 fully immunized for age children a maximum i.e. 288 (52.55%) were normal. Maximum i.e. 11(73.33 %) of the unimmunized children were under nutrition. This difference was not statistically significant. Paramita Sengupta, et al (2010)²⁴ showed that incomplete vaccination status was found to be important predisposing factors for childhood malnutrition. Among the different clinical features of malnutrition maximum number of children i.e. 118 (19.93%) had pale conjunctiva, 83 (14.02%) had caries, 71 (11.99%) had a thin general appearance and 60 (10.13%) had dry and scaly skin.(Table-4) Sudesh Jood et al⁴ observed that 16.67% of preschool children had hair with lack of luster, 16.67% had diffuse pigmentation on face, 23.03% had pale conjunctiva and 4.4% of them had Bitot's spots, 3.33% had beading of ribs and 6.67% of them had bow legs. Among children who had illness in the last one year, maximum children i.e. 54 (9.12%) had diarrhea and 53(8.95%) had acute respiratory infections.

A community based cross sectional study of under five children in a slum of Pune by Anjali B et al³² in 2012 showed that the overall prevalence of morbidities was 43.4%. Taufiq Mashal et al³³ showed that diarrhoea (32.5%) and acute respiratory infection (41.0%) were common child health problems.

CONCLUSION

In the present study, majority of the children were more than 36 months of age, female slightly higher than male. Majority of the children were Hindus, belonged to class IV and to nuclear type of family.

48.2% of the children were undernourished. Parent's literacy, socio-economic status and family size had an impact on better nutritional status of children. Faulty feeding practices, partial immunization, frequent diarrhea and other infections in the past one year were some of the epidemiological determinants for undernourishment. Clinical features of under nutrition were common.

RECOMMENDATIONS

Proper nutritional care of pre-school children with special attention of 49-60 months age group, educate mothers about growth chart, increase overall literacy and education level with emphasis on female literacy, importance of small family norms, increase Immunization coverage, inculcate importance of exclusive breast feeding, encourage hospital delivery, educate about disadvantages of prelacteal feeds and initiation of weaning at appropriate age with special attention towards nutritional status of mother with adequate birth spacing should be explained. Importance of proper care of their children during febrile illnesses and diarrhea along with use of O.R.S., timely referral and immunization.

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Incidence of Male Breast Cancer in A Tertiary Care Hospital: A Retrospective Study with Review of Literature

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ABSTRACT

Introduction: Even though breast cancer in males is relatively uncommon its incidence now seems to be substantially increasing. The significance of the study is to look into the estimates of male breast cancer patients in a tertiary care hospital.

Material and Methods: A retrospective study for a period of 3 years was undertaken. 27 male breast lumps and 189 female breast cancer cases proved on histopathology were included in the study. The data was analyzed using Microsoft Excel.

Results: Out of the 27 male breast lumps, 25 were gynecomastia and 2 were breast cancer. Out of the 191 breast cancer cases (female and male subjects included) infiltrating ductal carcinoma with non-specific features was the commonest type found in 170 patients. Other types include ductal carcinoma insitu 8 cases, 6 cases of infiltrating ductal carcinoma of medullary type. 5 cases were of invasive lobular type and 2 cases were Paget's disease of nipple.

Conclusion: The extremely very low sample size in a 3 year period limits the possibility of study of any epidemiologic factors and further work is needed for better understanding of this rare disease.

Keywords: Male Breast Cancer, incidence, epidemiology, gynecomastia

MATERIAL AND METHODS

Because breast cancers in men are rare, few patients are available for prospective studies. The aim of the study is to know the incidence of male breast cancer among the male patients presenting with breast lumps and also to know the incidence of male breast cancer among all breast cancer cases (both male and female included) presenting to our institution. This present study was a retrospective study for a period of 3 years from 01.11.2012 to 30.11.2015. The study being a retrospective study, no ethical issues or consent from the patients were needed/taken. All the male patients presenting to the surgical department and diagnosed and/or admitted for evaluation of breast lump were taken into consideration. All the breast lumps operated and whose biopsy reports which came as carcinomas (both male and female patients) were included in the study. The breast biopsy reports sent to the pathology department, after mastectomy (modified/radical) in case of operable lumps or true-cut biopsies in case of inoperable cases were cross-checked and analyzed.

RESULTS

A total of 27 male breast lumps and 189 female breast cancer patients were diagnosed and treated during this period. The data was analyzed by Microsoft Excel software. The age of presentation of the male breast lump patients was from 17 years to 51 years. Out of these 25 cases (92.59%) were gynecomastia and 2 (7.41%) were male breast cancer.

There were a total of 191 breast carcinoma cases during the study period of which 2 (1.045%) were male breast cancer patients and 189 (98.95%) were female breast cancer cases. The age of presentation of female breast cancer patients was from 24 years (youngest patient) to 81 years (oldest patient) with a mean of 47.8 years. The most common age in the female group was 40 – 49 years with 58 cases (30.69%), then 50 – 59 years with 49 cases (25.93%), followed by 30 – 39 years with 43 cases (22.76%), 60-69 years with 29 cases (15.35%), 70 – 79 years with 6 cases (3.18%), 20 – 29 years with 3 cases (1.59%) and there was also one case (0.5%) of 81 years. The two male breast cancer patients were aged 46 and 51 years respectively with the mean age of presentation being 48.5 years.

INTRODUCTION

Breast cancer in males is relatively uncommon, accounting for less than 1% of all breast cancers and less than 1.5% of all malignancies in men.¹ The incidence of MBC, once thought to be relatively stable, now seems to be substantially increasing. The incidence of male breast carcinoma increased significantly from 0.86 to 1.08 per 100,000 population in the past 25 years.² The worldwide variation of MBC resembles that of breast cancer in women, with higher rates in North America and Europe and lower rates in Asia.³ The major genetic factors associated with an increased risk of breast cancer for men include, BRCA2 mutations^{4,5} which are believed to account for the majority of the inherited breast cancer in men; a positive family history of breast cancer in first-degree relative⁶ or a positive history of breast cancer in a female relative⁷; Klinefelter syndrome,^{8,9} where there is increased levels of gonadotropins but low levels of androsterone and normal to somewhat low levels of estrogens, resulting in a high estrogen/androgen ratio.

Although the epidemiologic literature on female breast cancer is extensive, little is known about the etiology of MBC, the difference mostly being the rarity of the disease in men, which limits the application of epidemiologic methodology to studies of MBC.

Hence the present study was taken to look into the estimates of male breast cancer patients in a tertiary care hospital.

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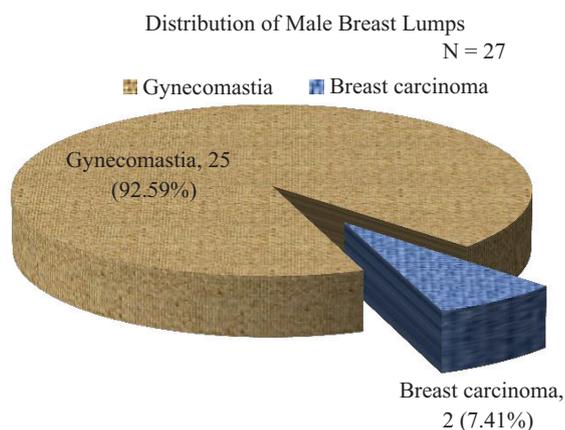


Figure-1: Distribution of Male Breast Lumps

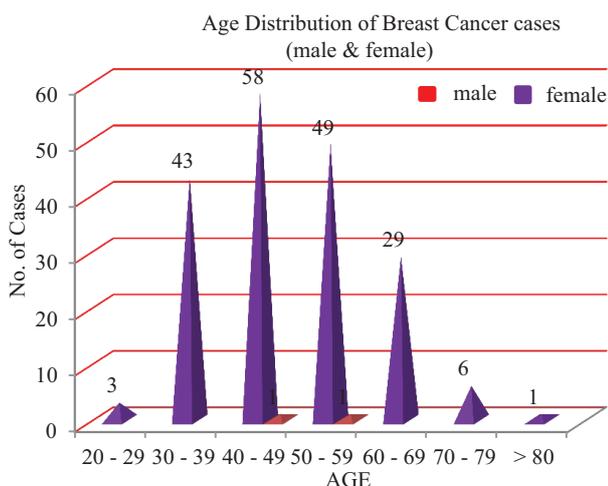


Figure-2: Age Distribution of Breast Cancer cases (male and female)

Type	Sub type	N = 191		
		Cases	%	
Lobular	In situ	0	0	
	Invasive	5	2.62	
Ductal	In situ	8	4.19	
	Infiltrating	170	89	
	Non-specific	Medullary	6	3.14
		Mucinous	0	0
		Tubular	0	0
		Papillary	0	0
		Inflammatory	0	0
Others	Paget's disease of nipple	2	1.05	
	Mixed lobular and ductal	0	0	

Table-1: Distribution of cases of different types of breast carcinoma

The two male patients presented in Stage III with mobile axillary lymph nodes and tumor size ranging between 4 – 7 cm. and skin infiltration. None of the male breast cancer patients received neo-adjuvant chemotherapy and both patients underwent modified radical mastectomy with axillary lymph node clearance. The histopathology specimen report came as infiltrative duct cell carcinoma for both the male breast cancer patients.

Infiltrating ductal carcinoma with non-specific features was the commonest type, found in 170 patients (89%) out of the total 191 breast cancer cases (both male and female cases included).

Other types include ductal carcinoma insitu 8 cases (4.19%), 6 cases (3.14%) of infiltrating ductal carcinoma of medullary type. 5 cases (2.62%) were of invasive lobular type and 2 cases (1.05%) were of Paget's disease of nipple.

Both the male breast cancer patient's specimens were negative for lymph nodes and were hormone receptor positive. Adjuvant chemotherapy and Tamoxifen were offered to them.

The male breast lumps which were diagnosed as gynecomastia underwent subcutaneous mastectomy. None of these histopathology specimen showed carcinomatous tissue embedded within.

DISCUSSION

The aim of this retrospective study was to study the incidence of male breast cancer at a tertiary care hospital. We came across 2 male breast cancer and 189 female breast cancer cases during the 3 year study period. So the male breast cancer accounts for 1.06% of all the breast cancer cases of the study period. The mean age of presentation in this study is 48.5 years which is very lower than the western studies where the mean age was 71¹⁰, and another Indian study were it was 57 years.¹¹

In the present study the most common histopathological type of male breast cancer was found to be infiltrating ductal carcinoma. The same histological type was also found to common by others like Ian S Fentiman et al¹⁰ in 2006 and Chikaraddi SB et al¹¹ in 2012.

Suspected genetic factors implicated in male breast carcinoma include Androgen Receptor (AR) gene mutations¹² where there is mutation in exon 3 encoding the DNA-binding domain of the AR causing the ability to bind to estrogen response elements and therefore activating the estrogen-regulated genes. (There is reduction in androgen levels and subsequent elevated estrogen/androgen activity ratio); CYP17 polymorphism^{13,14} where the 5'untranslated region of the gene contains a T-to-C polymorphism which creates an additional Sp1-type (CCACC) promoter motif leading to increased transcriptional activity and enhanced steroid hormone production; Cowden syndrome¹⁵ which is an autosomal dominant cancer susceptibility syndrome characterized by multiple hamartomas and germ line mutations in the PTEN tumor suppressor gene; and CHEK2*1100delC mutation variant.^{16,17}

Epidemiologic and dietary risk factors for male breast cancer include disorders relating to hormonal imbalances, such as obesity¹⁸, testicular disorders¹⁹ and radiation exposure.²⁰

Suspected epidemiologic risk factors include prostate cancer^{21,22}, gynecomastia^{22,24}, occupational exposures (e.g., electromagnetic fields²³, polycyclic aromatic hydrocarbons^{26,27}, and high temperatures²⁶; dietary factors (e.g., red meat intake and fruit and vegetable consumption); and alcohol intake.²⁹

Men tend to be diagnosed at an older age than women. Presentation is usually a painless lump, nipple retraction, or Paget's disease of breast, but is often late, with more than 40% of individuals having stage III or IV disease. When survival is adjusted for age at diagnosis and stage of disease, outcomes for male and female patients with breast cancer is similar.³⁰ The mean age of presentation in the western population is 71 years¹⁰ while in the Indian setting it is 57 years.¹¹ It is usually unilateral. The management is usually modified radical or radical mastectomy (mastectomy with axillary clearance or sentinel

node biopsy). Most are ductal carcinomas. As 90% of tumors are hormonal receptor positive, tamoxifen is standard adjuvant therapy. Indications for radiotherapy and chemotherapy are similar to female breast cancer. For metastatic disease, hormonal therapy is the main treatment, but chemotherapy can also provide palliation.^{30,11}

CONCLUSION

The main limitation of this study is it was a single-institution study having an extremely very low sample size (2 male breast cancer cases) in a 3 year period. So no concrete study of other epidemiologic factors is possible and further work incorporating multiple institutions is needed for better understand of this rare disease.

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A Review of 51 cases of Duodenal Perforation in Rohilkhand Region

Sharad Seth¹, Keshav Kumar Agrawal¹

ABSTRACT

Introduction: Anterior duodenal perforations complicating peptic ulcer disease still account for a large number of surgical emergency admissions in developing countries. This study was carried out to document etiologies, clinical features and management of duodenal perforations and to share our experience of managing these moribund patients.

Material and methods: This prospective observational study included 51 patients of duodenal perforation admitted in a single surgical unit of Rohilkhand Medical College and Hospital, Bareilly during a one year period from March 2015 to February 2016. Demographic data, clinical presentation, radiological findings, laboratory reports, operative notes, surgical procedure performed, postoperative progress, complications, hospital stay and mortality notes were meticulously entered in a previously prepared proforma for this purpose. Proportional analysis of all relevant data was done using the SPSS software version 22.0.

Results: Peptic ulcer disease was the commonest cause of duodenal perforation in 49 (96.08%) patients. Males accounted for 80.39% and females for 19.61% patients. X-ray chest PA view erect was diagnostic of pneumoperitoneum in 78.34% patients. All peptic ulcer perforations were small < 1 cm in diameter on the anterior portion of the first part of the duodenum and were repaired by a Cellan Jones omental patch. There were two (3.93%) mortalities attributed to septicaemia.

Conclusion: Duodenal perforations still account for an important cause of surgical emergency in third world countries like ours. Indiscriminate use of NSAIDs, steroids, alcohol and tobacco addiction leads to peptic ulceration. Trauma accounts for the rest. They require early diagnosis and surgery for improved survival in these critically ill patients.

Keywords: duodenal perforation, pneumoperitoneum, surgical management

INTRODUCTION

Small bowel perforations are one of the commonest surgical emergencies in our region. The majority of all bowel perforations occur in the duodenum, peptic ulcer disease being responsible for most of them. Blunt and penetrating abdominal trauma account for nearly all of the remaining patients. Decreasing trends of duodenal peptic ulcer perforations reported in Western literature¹ is a direct fallout of rational use of Proton pump inhibitors and elimination of H Pylori infections. Unfortunately the same results have not been replicated in economically poor regions like ours where we report a high incidence of peptic ulcer disease perforations occurring in the anterior part of the first part of the duodenum. Posterior wall perforations presenting as haematemesis are rare. Early diagnosis, aggressive preoperative resuscitation and prompt surgical management of such patients is extremely challenging but can save lives of most of these critically ill patients. This study was carried out to review the common etiologies, presentations, diagnosis, treatment and factors influencing survival in duodenal perforations in our

rural, limited resource region of Rohilkhand, Uttar Pradesh, India.

MATERIAL AND METHODS

This prospective observational study was carried out on 51 patients of duodenal perforation admitted in the surgical emergency of a single surgical unit of Rohilkhand Medical College and Hospital, Bareilly during a one year period starting March 2015 to February 2016. Due consent was taken from all patients and ethical approval was obtained from the hospital ethical committee for conducting this study.

Only those patients whose diagnosis of duodenal perforation was confirmed on laparotomy were included in this study. We excluded those patients who had a recurrence of perforation and those who had previous duodenal ulcer surgery. The diagnosis was based on a history of chronic ingestion of pain killers, steroids, cigarette/beedi smoking, chronic alcoholism or trauma with severe epigastric pain, abdominal distension, fever, vomiting and obstipation. Examination findings of tachycardia, dehydration, masked liver dullness, abdominal guarding, board like rigidity feeble or absent bowel sounds also lent themselves in making an appropriate diagnosis. Confirmation of diagnosis was done on the basis of findings of free gas under the right hemidiaphragm on an erect X-Ray chest PA view or erect plain X-ray abdomen AP view. For those too ill to move a left lateral decubitus view with gas in the right lateral flank also evidenced pneumoperitoneum. Ultrasound findings of free air and peritoneal fluid along with bowel thickening were also considered in the diagnosis of bowel perforation as were the presence of bile in an ultrasound guided peritoneal diagnostic tap. CECT was selectively used in those patients whose diagnosis was still in dispute and those of abdominal trauma to exclude associated injuries. All patients had a complete haemogram, blood sugar, serum creatinine, serum electrolytes and a duly consented HBsAg, HCV and HIV testing. All patients received crystalloid infusion with Ringer lactate solution with the intent of achieving a urinary output of 0.5 ml/kg/hr monitored by a per urethral Foley's catheter. Nasogastric aspiration and a combination of Cefoperazone, Gentamycin and metronidazole administered intravenously were the additional procedures for all patients. Laparotomy was done by a midline incision under general, spinal or epidural anesthesia as per the discretion of the anesthetist. A thorough survey of the intraperitoneal

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cavity was done. Bile or intraperitoneal fluid was sent for culture and sensitivity. All peptic ulcer perforations were repaired by the Cellan Jones technique of omental patch repair whereas primary transverse duodenorrhaphy was carried out for traumatic duodenal perforations. Copious intraperitoneal lavage with normal saline was done to evacuate collected bile and food debris. The abdomen was closed in a single layer using number 1 prolene over a perforated abdominal tube drain placed close to the repaired perforation. Postoperatively the nasogastric tube was removed when the aspirate became minimal usually with passage of flatus on the third postoperative day. Abdominal drain was removed after 48 hours and Foley’s catheter between the third to fifth day. Skin sutures were removed between the 8th to the 10th postoperative day. All patients of peptic ulcer perforation received H.Pylori eradication therapy consisting of PPI / Amoxicillin 1g and Clarithromycin 500mg twice a day for 10 days. Demographic data, clinical presentation, radiological findings, laboratory reports, operative notes, surgical procedure performed, postoperative progress, complications, hospital stay mortality notes were meticulously entered in a previously prepared proforma for this purpose.

STATISTICAL ANALYSIS

Proportional analysis of all relevant data was done using the SPSS software version 22.0.

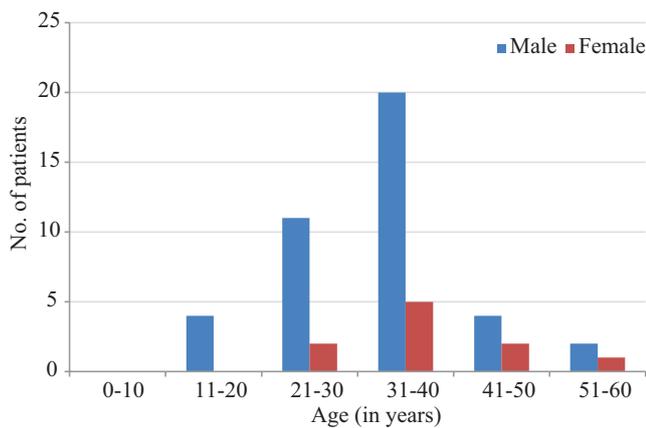


Figure-1: Age and sex distribution of duodenal perforations

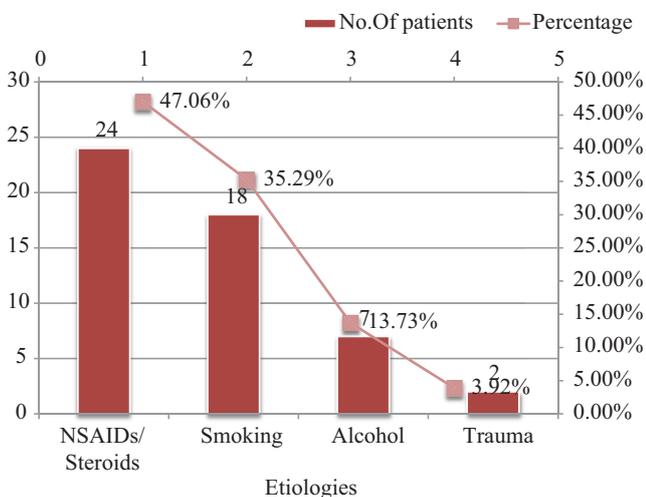


Figure-2: Etiologies of duodenal perforations

RESULTS

Peptic ulcer disease was the commonest cause of duodenal perforation in our study accounting for 49 (96.08%) patients. Only two (3.92%) patients were those of blunt abdominal trauma. The age incidence ranged from 11-60 years most of the patients being in the 31-40 year range. Males accounted for 41 (80.39%) patients and females for 10 (19.61%) patients (Figure-1). Peptic ulcers were attributed to NSAIDS/Steroid intake in 24 (47.06%) patients while smoking and alcohol were implicated in the rest (Figure-2). All patients belonged to a rural background. Pain in the epigastrium/ diffuse abdominal pain in 51 (100%) patients and abdominal distension in 49 (96.07%) patients were the commonest symptoms whereas tachycardia (94.11%), abdominal guarding and rigidity (94.11%) were the commonest signs elicited (Table-1). 35 (68.62%) patients presented within 24 hours of their catastrophe. X-ray chest PA view erect and X-ray abdomen erect were diagnostic of pneumoperitoneum in 44 (86.27%) patients. Ultrasonography and diagnostic peritoneal tap was positive in 40 (78.43%) patients. CECT was done only in three patients, two of abdominal trauma and one with an ambiguous diagnosis of perforation. All patients were operated within four hours of diagnosis. All peptic ulcer perforations were small < 1 cm in diameter on the anterior portion of the first part of the duodenum and were closed by a Cellan Jones omental patch. Only one patient (1.96%) developed a postoperative biliary leak with this procedure. Traumatic duodenal perforations occurred on the anterior wall of the second part of the duodenum and were repaired primarily by a transverse duodenorrhaphy. Post operative complications included Surgical site infection in 9 (17.64%), chest infections in six (11.76%)

Presenting symptoms	No. Of patients	Percentage of total
Pain in epigastrium/ diffuse abdominal pain	51	100%
Fever	18	35.29%
Nausea/vomiting	26	50.98%
Obstipation		29.41%
Abdominal distension	49	96.07%
Signs		
Tachycardia	48	94.11%
Dehydration	46	90%
Masking of liver dullness	18	35.29%
Abdominal guarding/rigidity	48	94.11%
Feeble or absent bowel sounds	42	82.35%

Table-1: Symptoms and signs in cases of duodenal perforations

	Number of patients	Percentage
Early Complications		
Wound dehiscence	4	7.84%
Surgical site infections	9	17.64%
Chest infections	6	11.76%
Paralytic Ileus	1	1.96%
Biliary leak	1	1.96%
Late Complications		
Incisional hernia	1	1.96%

Table-2: Postoperative Complications

and incisional hernia in one (1.96%) patient (Table-4). The average hospital stay was 10-13 days. There were two (3.93%) mortalities.

DISCUSSION

51 cases of duodenal perforations in a year constituted for a large number of emergency admissions in our surgical unit. We here discuss our strategy to manage these critically ill patients most of whom were saved by timely surgical intervention. Males in the age group 31-40 years were most commonly affected outnumbering females in the ratio 4.1:1 as also reported from another Indian study² but in complete contrast from a study in Norway³ where the male to female ratio was equal and most of the patients were above 50 years of age. Smoking, alcohol and NSAID abuse accounted for most of the cases due to peptic ulcer but probably more than one factor contributed to the disease as also reported in other studies.⁴ Tests for H.Pylori not being commonly available their exact contribution in the etiology of peptic ulcer in this study is not known. Abdominal pain, distension, tachycardia, abdominal guarding and rigidity were the commonest symptoms and signs on presentation as has been reported in most other studies.⁵ X-ray chest PA view erect revealed pneumoperitoneum in 86.27% patients similar to that reported by Bali et al⁶ whereas ultrasonography was diagnostic in 78.43% cases as also reported by Chakma et al.⁷ All patients were operated within four hours of diagnosis accounting for high survival rates. Other studies have also recorded high survivals for patients operated within 12 hours of developing epigastric pain.⁸ All peptic ulcer perforations were small < 1 cm in diameter on the anterior portion of the first part of the duodenum and were closed by a Cellan Jones omental patch. This is a simple and expeditious procedure which effectively seals the perforation.⁹ A primary transverse duodenorrhaphy was carried out for traumatic duodenal perforations as advocated in other studies.¹⁰ Surgical site infection (17.64%) was the commonest postoperative complication. Hospital stay ranged from 10-13 days as reported by others.¹¹ There were two (3.93%) mortalities attributed to septicaemia. Mortality rates of 6-14% have been reported in patients in whom surgery was carried out 24 hours after the patients first reported symptoms.¹² A study from Turkey has indicated an age > 60 years, shock at presentation and perforation > 0.5 cm in diameter as predictive of poor survivals.¹³ As most studies indicate that H.Pylori infection is usually synergistic with chronic NSAID use all peptic ulcer patients on discharge received eradication therapy with PPI/ Amoxicillin 1gm / and Clarithromycin 500 mg twice a day for 10 days as recommended in most studies.¹⁴ Till date we have not witnessed a single recurrence in this study group.

CONCLUSION

In our region the high incidence of tobacco and alcohol addiction amongst the rural folk coupled with indiscriminate use of NSAIDs and steroids by local practitioners accounts for the high incidence of duodenal perforations. Prompt diagnosis, aggressive resuscitation, early surgery and the quickly performed simple Cellan Jones omental patch repair results in high survival in these moribund patients.

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Kawasaki Disease: A Case Report

Abdullah Al Saleh¹

ABSTRACT

Introduction: Kawasaki disease is vasculitis of the medium and small sized vessels. This disease involves the coronary arteries and has the potential to be life-threatening. The diagnosis of Kawasaki disease still relies on the clinical criteria and it needs a high index of suspicion to diagnose.

Case report: I report a case of Kawasaki disease where a three-year-old boy, presented with prolonged fever, skin exfoliation, cracked lips, non-purulent conjunctivitis and cervical lymphadenopathy. He was fully investigated and treated with intravenous immunoglobulin and aspirin.

Conclusion: Any child with suspected Kawasaki disease, should receive prompt diagnosis and early institution of intravenous immunoglobulin and aspirin as this will help to reduce coronary complications.

Keywords: Kawasaki disease, vasculitis, exfoliation

INTRODUCTION

Kawasaki disease is an acute febrile, systemic vasculitic syndrome of unknown etiology, occurring primarily in children younger than 5 years of age. It was formerly known as mucocutaneous lymph node syndrome. This condition was first described by Dr. Tomisaku Kawasaki in 1967.¹

The incidence is greatest in children of Asian race. The Japanese population has incidence of 80-100 cases/100,000 children below 5 years of age. In the United States, its incidence is approximately 8 cases/100,000 children under the age of 5; whereas in European children under 5 years of age, the incidence is even lower ranging from 3-6 cases/100,000.^{2,3} Boys are affected about 50% more often than girls. The disease occurs throughout the year, although it is more common in spring and winter.⁴ Kawasaki disease still remains an etiologic dilemma. Many epidemiologic and laboratory studies have looked at the relation between Kawasaki disease and various infectious agents, none of these associations have been proven.⁵

The disease tends to be self-limiting and usually resolves without treatment within about 12 days.⁶ However, Kawasaki disease can result in coronary aneurysms, Patients who suffer coronary artery damage may develop thrombosis or stenotic lesions associated with the aneurysms and are at risk of myocardial infarction, congestive heart failure and sudden death. The early recognition and treatment will significantly reduce the incidence of these complications. In patients without treatment, the incidence of cardiac complications is 20% to 25%.⁶ With treatment, the incidence decreases to 4%.⁶ Treatment should be initiated as soon as the diagnosis is made and should involve the administration of intravenous immunoglobulin (IVIG) and high-dose aspirin.

CASE REPORT

A three-year-old Saudi male child presented with a history of high grade fever for 13 days, swelling in neck for seven days,

and skin exfoliation on the palms and soles of the feet for three days. He was initially seen and treated by a pediatrician in a private clinic, who prescribed an oral antibiotic to treat his symptoms. The child used the antibiotic without any improvement; he was then sent to the Pediatric Clinic of the National Guard Comprehensive Specialized Clinic in Riyadh, Saudi Arabia for further evaluation. His physical examination revealed fever with skin exfoliation on his palms and the soles of his feet (figure-1), significant tender lymphadenopathy over the posterior triangle of the left side of the neck, a strawberry tongue with cracked lips, and non-purulent conjunctivitis in both eyes. No skin rash was observed.

Investigation showed a total WBC count of 15.2×10^9 cells/L with 22% neutrophils, ESR (118 mm at the end of 1 hour), positive C-reactive protein, and high platelet count (1106×10^9 /L). His anti-streptolysin-O titers were normal. The test for anti-nuclear antibody was negative. The throat swab culture was sterile. Liver enzymes were normal. Routine examination and culture of urine was negative. Echocardiograph was also normal. He was started on aspirin (100 mg/kg/day). His symptoms subsided within 24 hours of starting aspirin. He was discharged and maintained the same dosage of aspirin for one week, then the dose was reduced to (5 mg/kg/day) for the next 6 weeks. During his one week follow up, he was asymptomatic except for the exfoliation over on his hands and feet. Repeated CBC was markedly improved with WBC count 7.8×10^9 cells/L, and platelet count (543×10^9 /L). ESR was 26. Two additional echocardiographs, one after 2 weeks and another after 6 weeks, were normal.

DISCUSSION

Kawasaki disease is the second most common cause of vasculitis in children after Henoch Schonlein purpura.^{2,3} Early diagnosis and treatment of Kawasaki disease is of the utmost importance because of the dreadful complications that can occur during the acute illness. These complications include coronary arteritis, myocarditis, pericarditis, congestive heart failure and sudden death. The incidence of coronary aneurysm is around 20% of cases if left untreated. The diagnosis of Kawasaki disease is basically clinical and it is a diagnosis of exclusion. There are diagnostic criteria for the diagnosis of Kawasaki disease. For my case, I used the Japanese worker's criteria.⁷ This patient had 4 criteria for the diagnosis of Kawasaki disease. Diagnostic

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Figure-1: Exfoliation on the palms

criteria for kawasaki disease includes fever lasting for at least 5 days along with presence of at least 4 of the principal features: (1) Bilateral conjunctival injection, generally non-purulent, (2) Changes in the mucosa of the oropharynx, including injected oropharynx and dry fissured lips, and strawberry tongue, (3) Changes in the peripheral extremities such as edema and/or erythema of hands or feet during the acute phase, (4) Rash, primarily truncal, polymorphous, but non-vesicular, (5) Cervical lymphadenopathy (more than or equal to 1.5 cm in its diameter), usually unilateral. In addition to these criteria, illness should not be explained by other known disease processes.

In Kawasaki disease, it is very important to start treatment early, as this will help to reduce the risk of complications. The drug of choice in such situations will be a single dose of IVIG (2 g/kg) and then aspirin (100 mg/kg/day) for 14 days, followed by 3–5 mg/kg/day for 6 weeks.⁸

Treatment with IVIG relieves the acute inflammation and has been shown to reduce the rate of coronary aneurysms from more than 25% in untreated patients to 1-5% in treated patients. Maximum benefits are seen when IVIG is given within the first 10 days of the illness. Anti-inflammatory high dose aspirin (80-100 mg/kg/day orally divided into 4 doses) is given during the acute phase. Such dose should be continued until day 14 of the illness or until the patient has been afebrile for 48-72 hours, then a low-dose aspirin (3-5 mg/kg/day) is initiated for its antiplatelet activity for a total of 6-8 weeks provided patient shows no evidence of coronary abnormalities.^{9,10} With prompt treatment, the prognosis of Kawasaki disease is good. The average mortality rate in the United States is approximately 1% of affected children. In patients younger than 1 year of age, the mortality rate may exceed 4%. In patients aged 1 year or older, the death rate is probably less than 1%. The mortality rate in Japan is twice among boys with Kawasaki disease.

CONCLUSION

Kawasaki disease is terrifying vasculitis in a child. Any child presented with fever lasting more than a week, skin rash, peripheral extremities changes with edema or exfoliation, cracked lips, non-purulent conjunctivitis and cervical lymphadenopathy, should be investigated for Kawasaki disease. Prompt diagnosis and early institution of intravenous immunoglobulin and aspirin are of utmost importance in preventing coronary complications.

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Outcomes of Xenoderm Versus Conventional Dressing in Case of Second Degree Burns

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ABSTRACT

Introduction: For decades burns were treated with different kind of natural and synthetic dressing which had its own advantages and disadvantages. This retrospective study aims to compare the outcomes of xenoderm and conventional dressing in second degree burns.

Material and methods: Sixty patients (24 males, 36 females) with second degree burns with total body surface area of 10% to 50% were investigated from January 2014 to January 2015. They were divided into two groups, first received xenoderm dressing [n=30] and second [n=30] received conventional dressing. The mean age in the xenoderm group and the conventional group was 28 ± 11.6 years and 30.13 ± 10.6 years respectively.

Results: Mean duration of epithelization in xenoderm and conventional group was 12.5 ± 6.9 days and 23.7 ± 14.7 days respectively. Mean duration of hospital stay in xenoderm group is 9.86 ± 6.8 days compared to 16.0 ± 15.3 days in the conventional group. Compared to conventional dressing group, pain duration was shorter, overall average cost and infection rate were lower, total number of dressings were less. There were two deaths occurred in the conventional group, both patients sustained burns of total body surface area of 50%.

Conclusion: Xenoderm dressing is an effective and safe in treating second degree burns. It was observed that xenogenous porcine skin membrane had more beneficial effects in treating burns patients by significant reduction in pain, hospital stay, cost of treatment and infection rates. Thus making it a good choice for treatment in second degree burns alternate to conventional dressings.

Keywords: Burn wound; Xenoderm dressing; conventional dressing; cost

INTRODUCTION

Burn is a partial or complete destruction of the skin usually caused by thermal energy, steam and hot liquids, chemicals electrical or explosions and could be a devastating event which leads to a cascade of life threatening complications.¹ Burns are one of the leading causes of disability and death worldwide, accounting for 300,000 deaths per year.^{2,3} These are common entities found in clinical practice and dressings plays a major role in treatment of burns.¹ Widely preferred treatment options include a synthetic (Integra, transyte and biobrane) or biological dressings (xenoderm, xenograft and allografts).^{4,5} Wounds that are covered with dressing material heal faster, with less contracture than open wounds. All dressing materials whether biological or non-biological usually acts by forming a barrier between wound and the environment, thereby preventing bacterial infection and wound desiccation.¹⁻⁶ However the biological dressing materials show better adherence than non-biological materials and studies have shown that dressing materials, which adhered well to the wound, helped to reduce pain, limit infection and consequently

optimize the rate of healing.^{7,8}

For achieving better outcomes the wound dressing should possess the desired properties.⁹ Xenoderm (porcine skin) has gained a significant acceptance as a temporary dressing for the past 4 decades and several studies reported the efficacy in the treatment of burns.¹⁰⁻¹⁴ Porcine has the advantage which makes it a better dressing material in the treatment of burns which are a) adhering to wound surface, b) proper coverage of nerve endings to decrease pain, c) loss of fluid electrolytes, d) facilitate the proliferation of epithelial cells and e) achieve spontaneous healing.^{9,14-16} Availability of porcine skin over xenografts and allografts (homograft and cadaver skin) plays a role for the surgeon to select for transplant purposes. The main advantage of the porcine skin is its close nature to human skin, readily available, cost effective and HIV free.¹³⁻¹⁵ There is a need for a method in which there is early healing with minimal pain, discomfort and scarring. Thus a need is felt to study the effectiveness of xenoderm dressing in comparison to conventional dressing. In this study (1) we compare the efficacy of xenoderm dressing over conventional dressing in treating cases of second degree burns. (2) To assess infection rates and duration of healing of burns. (3) To compare cost efficacy and duration of hospital stay of patients treated with xenoderm dressing and conventional dressing.

MATERIAL AND METHODS

Between January 2014 to January 2015, 60 patients treated with second degree burns (superficial and superficial plus deep) at 'The First Affiliated Hospital of Soochow University', Suzhou, Jiangsu province, P.R.China were included in the study. An informed consent was obtained from all patients to be enrolled in this study. Institutional review board approval (hospital medical ethics audit No: 2014D245) was obtained for this retrospective case-control study.

The inclusion criterion was: (1) Patients with second degree burns due to flame or scalds less than 48 hours old. (2) Total body surface area (TBSA) more than ≥10% and ≤50%.

The criteria for exclusion was: (1) Wounds or burns with exposed bone, tendon or joint, (2) Electrical and chemical burns, and (3) Burns occurring in children less than 10 years and adults more than 50 years of age.

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Randomly, patients were treated with xenoderm (pig skin) or conventional (silver sulfadiazine (SSD), povidone iodine and paraffin wax). 30 patients underwent xenoderm dressing (M:F 13:17) with mean age of 27.0 ± 16.6 years and 30 patients with mean age of 30.13 ± 10.7 underwent conventional dressing. The male to female ratio was 1:1.5. 38 patients were diagnosed with second degree superficial burns (63.3%) and 22 with second degree superficial plus deep burns (36.7%). Detailed patient demographics were mentioned in table 1, 3.

Technique of application

Xenoderm dressing

Patients were sedated by routine anaesthetic procedure as per department protocol before debridement. A thorough wash of the burn is done using normal saline. The dead skin and necrotic tissue was removed from the burn wound. Then we used povidone-iodine to wash the wound followed by normal saline, and the procedure was repeated twice. Xenoderm (all xenoderm that were used were manufactured by Yochuang Biomedical technology Co.LTD, Jiangsu, produced under Chinese food and pharmaceutical register number: 2010-36411111, batch number: YZB/China 3037-2010, with a standard size of 20*40, 10*20 cm, from the package slot: DC-ADM-b) was applied to the burn wound with the dermis surface toward the wound by a senior surgeon (Z.X.Y). Later we used cotton gauze to cover the xenoderm and fixed by using bandage. Generally, in the early

stage there might be secretions oozing from the wound, these secretions were drained out through the holes on the xenoderm; when the gauze over the xenoderm was soaked wet, we changed the gauze. Because we didn't change the xenoderm on the wound, there were no painful feelings caused, the wound would usually heal in less than two weeks, by this time, the xenoderm is desiccated and peeled off from the newly healed wound by itself. For first degree burn, at our institution, we do not use xenoderm to cover the wound for dressing. As the first degree burn usually heals in one week without any treatment.

Conventional dressing

After debridement and cleaning, in the early stage (usually for 3 to 5 days) we just used paraffin gauze and ordinary gauze to cover the wound, in the process if the wound is not clean or if there were any signs of wound infection, we then used topical agents such as silver sulfadiazine cream and betadine solution. In order to keep the wound clean and dry, we had to change the dressing every day, or at most every other day, that caused much pain and discomfort to the patients, because of the pain that is caused at the time of dressing change; sometimes we had to sedate the patient. Patients of both the groups were also given intravenous broad spectrum antibiotics and intra muscular analgesics.

Results obtained were calculated according to the following criteria

Rate of healing was measured by the number of days required

Item	Xenoderm Group (n=30)	Conventional Group (n=30)	p
Gender (n)			0.05
Male	13	11	
Female	17	19	
Mean age (x±s years)	27 ± 11.6	30.13 ± 10.6	0.28
TBSA (%)	22.6 ± 13.6	29.1 ± 14.5	0.09
Degree of burn [n (%)]			
2 nd degree (superficial)	25 (83.3)	13 (43.3)	
2 nd degree (superficial + deep)	5 (16.7)	17 (56.7)	
Cause of burn			
Flames	26 (86.7)	16 (53.3)	
Scald	4 (13.3)	14 (46.7)	
Facial injury [n (%)]	14 (46.7)	17 (56.7)	
Inhalation injury [n (%)]	6 (20)	5 (16.7)	
Co-morbidities [n (%)]			
Diabetes mellitus	15 (50)	18 (60)	0.44
Hypertension	1 (3.3)	0	0.32

Table-1: Patients demographics

Item	Xenoderm Group (n=30)	Conventional Group (n=30)	p
Duration of epithelization(x±s days)	12.5 ± 6.9	23.7 ± 14.7	0.0005
Total number of dressings (x±s times)	1.96 ± 2.57	8.73 ± 9.62	0.0007
Duration of pain (x±s days)	6.46 ± 5.74	9.6 ± 8.09	0.04
IV analgesics (x±s times)	7.43 ± 7.25	9.3 ± 8.6	0.36
Infection rate [n (%)]	2 (6.67)	7 (23.4)	0.02
IV antibiotics (x±s times)	7.23 ± 5.59	9.23 ± 8.23	0.27
Debridement (x±s times)	2.03 ± 0.41	1.9 ± 0.54	0.29
Death [n (%)]	0	2 (6.66)	0.005
Duration of hospital stay (x±s days)	9.86 ± 6.8	16.0 ± 15.3	0.04
Cost of treatment, ¥ (x±s)	14693 ± 8739.14	26220 ± 2387.32	0.001
IV: Intravenous			

Table-2: Outcomes of treatment in both groups

Item	Xenoderm Group (n=30)	Conventional Group (n=30)
Age		
<15	4	2
15-30	15	12
30-50	11	16
TBSA (%)		
<20	15	
20-40	9	13
>40	6	9
TBSA: Total body surface area.		
Table-3: Grouping by age, and TBSA in both groups		

for complete epithelialization of the wound.

Total no of dressings done were recorded during the hospital stay.

Infection as being present or absent by checking for any pus under the dressing visually, and when infection is present, the puss is sent for culture and sensitivity.

Patient compliance is determined by the feedback given by the patients about the comfortability of the dressing during follow-up.

Duration of hospital stay and cost of hospital stay are obtained from the hospital medical records.

STATISTICAL ANALYSIS

All statistical analysis were performed by SAS for windows version 8.2 (SAS Inc, USA). Values and measurement data were expressed by mean \pm standard deviation, frequency and percentage. The continuous data were analysed by two tailed, unpaired student 't' test. When the data couldn't meet normal distribution, Mann-Whitney U test was selected. Statistically significant difference in frequencies was evaluated by Chi-square analysis. A p value of <0.05 was considered to be statistically significant.

RESULTS

Age: In this study patients within the age group of 10 to 60 were included with most of them belonging to less than 25 years of age. No statistical significance was observed for age compared between the groups $p=0.05$ (Table 1, 3).

Sex: Of the 60 cases included in this study, 36 patients were females and 24 patients were males. There is a female preponderance of cases in the present study with a male to female ratio of 1:1.5 (Table-1).

Duration of epithelisation: In the study groups epithelization is observed faster in cases treated with xenoderm dressing than in patients treated with conventional dressing. Facial burns treated with xenoderm dressing had better healing with less scarring and less contractures. Mean duration of epithelization in xenoderm and conventional group of dressing is 12.5 and 23.7 respectively. This is statistically significant with a $p=0.005$ (Table-2).

Total number of dressings: Patients treated with xenoderm required dressing only once compared to multiple dressing in case of conventional modes of dressings. There is a better compliance for single dressing compared to multiple dressing in conventional dressing. It's advantageous in decreasing the pain to the patient and reducing burden on medical personal. It is

statistically significant with a $p=0.0007$ (Table-2).

Duration of pain: Patients treated with xenoderm dressings have significant decrease in pain within 24 hrs of dressing with a decreased need for IV/IM analgesics. Mean pain scoring in xenoderm group is 6.4 days compared to 9.6 days in conventional groups with statistical significance with a $p=0.04$. even though there was a significant decrease in the pain levels in the xenoderm treated patients, but the need for IV analgesics was not statistically significant $p=0.36$ (Table-2).

Infection rates: Due to early epithelization and less exposure of raw surface, the infection rate in xenoderm group is less than conventional group. Infection rate is assessed by looking for any pus under the dressing. 2 of 30 patients in xenoderm group and 7 of 30 patients in conventional group had wound infection with a $p=0.02$ (Table-2). The most common organism of infection in both the groups was Pseudomonas. Other common organisms were Klebsiella, Streptococcus etc. Most of the infective organisms are more sensitive to cephalosporin's and beta-lactam antibiotics. However there was no statistical difference observed in the use of antibiotic infusion in both groups $p=0.27$. There were two deaths recorded in the conventional group, both patients sustained burns of TBSA 50%. No deaths were recorded in the xenoderm group (Table-2).

Duration of hospital stay: Patients treated with xenoderm dressing discharged early compared to the patients treated with conventional dressings. Patients are discharged after at least 50% of epithelization. Mortality occurred in two patients treated with conventional modes of dressings with 45% and 50% burns. Mean duration of hospital stay in xenoderm group is 9.86 days where in case of conventional dressing it was 16.0 days. Significant statistical difference was observed $p=0.04$ (Table-2).

Cost of the treatment: Cost of the treatment is significantly low in patients treated with xenoderm dressing and was more in conventional dressings. Operation room cost and dressing costs have also been included to determine the significance of cost of treatment. For the xenoderm group the average cost was RMB 14693 ± 8739.14 (range, 6200~34560 RMB), and in the conventional group the cost averaged RMB 26220 ± 2387.32 (range, 9000~45000 RMB), with a significant statistical difference between the groups $p=0.0001$. For the xenoderm group the total average cost is 50% less compared to conventional dressing group (Table-2).

DISCUSSION

Treating patients who suffered with burns is a challenging task to surgeons. Extensive involvement of body surface area by burn is a painful condition and is highly susceptible to infection increasing the morbidity and mortality.⁴ Raw areas of skin cannot prevent the loss of body heat as the normal skin does by controlling vasodilation and sweat formation.¹⁷ Biological dressing (xenoderm) possess numerous properties which promotes wound healing, porcine dressing is one of its kind. It protect the wound from loss of fluid, protein and loss of heat, and it is considered a better choice of dressing which provides pain relief relatively faster when compared to other conventional dressing materials.^{7,13,18,19} Both xenoderm and conventional dressings poses significant advantages therefore the purpose of this study was to analyse the outcomes and

evaluate the potential benefits, we hypothesize that xenoderm outweigh the potential benefits of conventional dressings. Surprisingly there were very limited literatures on porcine skin and its derivatives on burn care although it is being used for a very long time since the early 1960's.¹¹ In addition, the result previously published had mixed conclusions.

Wound infection is a serious problem sustaining a burn injury, this is the leading cause of sepsis could even lead to death of the patient.^{5,20,21} A study by de Macedo et al²¹ on 252 patients treated at the burns unit, 19.4% developed clinically and microbiologically proven sepsis. Several factors have been identified for burn infections, most important are the extent of burn, age of the patient, comorbidities, impairment of blood flow and microbial factors.²² Our results showed that in the conventional group the rate of wound infection was higher compared to that of the xenoderm group (6.6% Vs. 23.3%). Though literatures reported low infection rates using conventional dressing^{23,24}, in a clinical trial of 78 patients by Hosseini et al¹², reported significant higher wound infection rate between silver sulfadiazine (SSD) and xenoderm (40.5% Vs. 17.9%). Similar results were reported by Caruso D.M et al²⁵ and Costagliola M et al.²⁶ One possible explanation for the increased wound infection in the SSD treated patients is the repeated change of dressings leading to contaminations. The adherence characteristic of xenoderm prevents the formation of hematoma and seroma, thereby acting as a physical barrier against nosocomial cultures.^{10,27,28}

The role of silver and sulfadiazine in the mechanism of action of silver sulfadiazine on burn wound infections was extensively investigated. Bacteria was bound by the silver but not sulfadiazine. Low concentrations of sulfadiazine did not act as an antibacterial agent, but showed joint action in combination with sub-inhibitory levels of silver sulfadiazine. Silver sulfadiazine's efficacy results from its slow and steady reaction with serum and body fluids contacting sodium chloride. Therefore permitting slow and sustained delivery of the silver ions in to the wound.²⁹

Reduction in number of dressing post application of xenoderm plays a major role in pain relief at the time of dressing replacement, patients comfort and significant reduction of overall cost. Hosseini et al⁶, reported that the mean number of dressings after xenograft was 1.51 ± 1.6 (range 1-9). The same study reported that 86% of patients had only one dressing change post-surgery. In comparison, in our study we found a significant statistical difference in the number of dressings in both groups ($p=0.0007$). Our results were supported with similar literatures.⁸ Dressing was required only once in case of xenoderm group and multiple dressings were required in the conventional groups causing pain to the patient during every day dressing and a significant burden to the attending medical staff.

In the present study duration of epithelization (days) was significantly lower compared between xenoderm and conventional groups ($p=0.0005$). Re-epithelialization is the integral stage in the repair of superficial and deep atrial thickness burns to restore the full function of dermis, during which keratinocytes migrate and proliferate to cover epidermal defects. Xenoderm is found to have a positive role on the proliferation and differentiation of human keratinocytes as well on fibroblast proliferation.

Use of porcine dressing has also been associated with decrease in duration of hospital stay and overall cost. In a study by Still et al³⁰, reported an average duration of hospital stay of 7 days with 19.3% needing readmission for subsequent excision and grafting in patients with 25% TBSA. They found that application of porcine xenograft resulted in overall decreased duration of hospital stay even when accounting for these additional procedures.³⁰ In our study, the average duration of hospital stay in the xenoderm group was 9.86 days which was statistically significant ($p=0.04$).

Xenoderm is readily available mainly from commercial pharmaceutical companies and its supply is adequate and well controlled. There are well established quality control for the production and usually companies are well stocked thus making less expensive compared to other available biological dressings. To our knowledge, so far no published studies reported the cost effectiveness of xenoderm dressings, despite the abundant availability and its wide usage. In a review by Hermans et al⁴, mentioned the cost of a single porcine xenograft sized 8*10 cm was \$25 (¥150) for glutaraldehyde preserved and \$0.15- \$0.71 (¥0.9 - ¥4.27) for cryopreserved xenograft, which was far cheaper than the available biological dressing products. At our institution all the xenoderm that we used were glutaraldehyde preserved and were manufactured by Yochuang Biomedical technology Co-LTD. In our study the overall average cost for xenoderm and conventional group was ¥14693± 8739.14 and ¥26220 ± 2387.32 respectively. Our results shows that xenoderm dressing was approximately 50% cheaper compared to conventional dressing.

This study has several limitations, which includes: (1) being a retrospective study, this would have compromised the analysis; (2) the sample size is relatively small to draw any conclusions, and there was no control group, which could reduce the objectivity of the study. In order to draw a conclusion, a relatively large sample is required; this might lead to underestimate the significance of the outcomes. Further prospective randomized studies should be undertaken to determine the advantages and draw solid conclusions in treating burns with xenoderm.

In the present study xenoderm is used as an alternative to SSD to cover the raw areas during the initial phase of healing in 30 out of the 60 patients included in the study. Duration of epithelization is early in case of xenoderm group patients compared to conventional group patients.

CONCLUSION

Xenoderm dressing is an effective and safe in the treatment of second degree burns. Xenoderm dressing was found to facilitate the rapid formation of granulation tissue, forms a barrier prevents excess fluid loss, and prevents infection. It was observed that xenogenous porcine skin membrane had more beneficial effects in treating burn patients by significant reduction in pain, hospital stay, cost of treatment and infection rates. Its wide availability and less cost, make it a good choice for treatment of second degree burns alternate to conventional dressings.

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Pyogenic Granuloma as a Posterior Maxillary Swelling in Edentulous Region: A Rare Case Report

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ABSTRACT

Introduction: Pyogenic granuloma (PG) is described as a benign granulation tissue which is formed in response to various stimuli (inflammatory hyperplasia). The term itself is a misnomer as there is no frank infection. Various factors can lead to the formation of PG like low grade local irritation, traumatic injury or hormonal factors. PG is predominantly seen in second and third decade of life, mostly in young females. In the oral cavity they are commonly found in the anterior segment over the gingiva.

Case Report: We present a case of pyogenic granuloma in a 56 year old female patient with a large size (3 ×3 cm) in the edentulous posterior maxilla.

Conclusion: PG is a non specific growth that can be found in any part of the oral cavity. It can present with unusual clinical features. Surgical excision is treatment of choice along with long term follow up.

Keywords: pyogenic granuloma, alveolar mucosa, surgical excision, edentulous, extra gingival

INTRODUCTION

The term pyogenic granuloma was coined by Hartzell and was first reported by Hüllihch in 1844. The term PG is a misnomer as it is not related to any infection and does not contain pus and is not a true granuloma.^{1,2} It is basically a nodular overgrowth of granulation tissue which can arise from mucosa or skin surface. More than two third of lesions are found on gingiva followed by lips, buccal mucosa, palate, vestibule and very rarely on edentulous area.³ Size of the lesion can range from 3mm to large sizes 5-6 cms. More than 70% of the lesions occur in females. Mostly it is a well-vascularized lesion which can bleed even after any minor form of injury or stimuli.⁴ There are two kinds of pyogenic granuloma namely lobular capillary hemangioma (LCH) type and non LCH type which differ histologically. Pyogenic granuloma when occurs on rare location, there is a critical need for its proper diagnosis and, management. This article aims to present a rare case of extra gingival pyogenic granuloma at a rare site i.e alveolar mucosa of edentulous ridge in maxilla.

CASE REPORT

A 56 year old female patient came with chief complaint of growth in upper left posterior alveolar ridge since 6-7 months. Patient revealed that growth started as a small nodule 7 months back and developed to attain its present size. Patient's medical history was unremarkable. Patient had lost her posterior teeth 2 years back and was not a denture wearer. Growth caused interference in mastication. On intraoral examination all left posterior teeth were missing along with premolars and canine. There was an exophytic, pedunculated growth measuring 3×3 cm arising from the alveolar mucosa in second premolar and first molar region (Figure-1). The lesion was firm, non tender and no bleeding was

seen on palpation. OPG (orthopantomogram) showed no bony involvement. Peripheral giant cell granuloma and peripheral soft fibroma were considered in the differential diagnosis. An excisional biopsy was carried out. Histopathological report showed multiple proliferations of blood capillaries in a dense connective tissue, diagnostic of pyogenic granuloma. At 8th month follow up there was no evidence of recurrence.

DISCUSSION

Historically PG was considered as a botryomycotic infection, transmitted from horse to man. Later on it was thought that these lesions were caused due to pyogenic micro organisms like streptococci and staphylococci. However there was no infectious micro organism isolated so the term PG became a misnomer. Few have even regarded PG as a benign neoplasm earlier but now it has been established as a reactive hyperplastic lesion. It is the most common diagnosis for reactive lesions of the gingiva.⁵ Synonyms of PG includes hemangiomatous granuloma, granuloma telangiectaticum, human botryomycosis, and pregnancy tumor. Causative factors reported for PG are low grade infection, trauma, irritation, hormonal influences and certain drugs like cyclosporine.³ More than one third of the PGs develop after trauma particularly lesions occurring on the extra gingival sites such as alveolar ridge and palate. Plaque, calculus, poor oral hygiene, improper restorations can also cause PG particularly those involving gingival tissue. In the case reported constant trauma inflicted by the alveolar tissue due to betel nut (patient had habit of betel nut chewing) may have led to proliferation of connective tissue leading to the formation of PG. PG is particularly common during second decade of life with female sex predilection, may be due to vascular effect of female hormones (estrogen and progesterone).³ In the present paper PG was noted in much older patient which is unusual and rare.

PG commonly occurs on gingiva i.e. interdental papilla in about 70% gingival cases, lip and buccal mucosa.⁶ Other rare sites include alveolar mucosa, edentulous ridge, palate and lower lip.⁷ Our case was seen on alveolar mucosa of edentulous maxilla. Clinically PG appears as sessile or pedunculated localized solitary mass. Surface may be lobulated or smooth, reddish or purplish in color. However older PGs have more fibrous appearance. Histologically PG shows presence of granulation tissue with

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Figure-1: Intra oral picture showing PG in the left posterior maxillary region

proliferation of endothelial cells. There is also infiltration of acute and chronic inflammatory cells. The two kinds of pyogenic granuloma namely lobular capillary hemangioma (LCH) type and non LCH type which are different histologically as well as clinically. LCH type occur more frequently as sessile, whereas non LCH type mostly occur as pedunculated. Immunohistochemistry of PG shows factors such as angiotensin II, ephrinB2, Tie2, angiotensin I and EphB4.^{4,8} It has been reported that cells in PG have low apoptosis due to anti-apoptotic proteins like bcl-2.⁹ Differential diagnosis of PG includes peripheral giant cell granuloma, peripheral odontogenic fibroma, ossifying fibromas, hemangiomas, Kaposi's sarcoma, squamous cell carcinoma, basal metastatic carcinoma. For treatment of PG the treatment of choice is excisional surgery followed by curettage of underlying tissue. Other treatment modalities include lasers Nd:YAG, CO₂, flash lamp pulsed dye laser, cryosurgery, injection of absolute ethanol, sodium tetradecyl sulfate (STS) sclerotherapy, intralesional corticosteroid injections have also been reported. 15% recurrence rate has been reported, however recurrence after surgery of extralingival pyogenic granuloma is uncommon.¹⁰

CONCLUSION

PG is a non-specific growth in the oral cavity. Final diagnosis can be done only with biopsy. Follow up of the patient is important to prevent recurrence.

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Nucleic Acid Testing in Blood Donors of Northern India: A Single Centre Experience

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ABSTRACT

Introduction: Safety is still the main aim of donor screening programs. Majority of blood banks in India are employing screening by 3rd generation ELISA and only few have ECI testing. Aim of the study was to we report the efficiency of Nucleic Acid Testing (NAT) during the first twelve months of its implementation, to evaluate the risk of transfusion transmitted infections missed by serological screening at Department of Transfusion Medicine, King George's Medical University, and Lucknow

Material and Methods: Blood units were screened by ELISA. A total of 35,722 donations were non reactive by ELISA. These seronegative blood units were tested using the Roche cobas TaqScreen MPX test form from May 2012 till April 2013.

Results: NAT screening detected total 156 NAT yield donations among 35,722 seronegative donations. Among 156 NAT yields cases, 108 (69.2%) reactive for HBV, 46 (29.5%) reactive for HCV and 2(1.28%) reactive for HIV-1. Upon additional testing which employ ECL; 51 of HBV were reactive for HBsAg and twelve were reactive for HCV. (21) HBV and (2) HCV NAT yield samples could not be tested by ECL due to insufficient sample volume. As such, total number of valid NAT yield cases was reduced to ninety three cases with fifty seven (61.3%) HBV NAT yield cases and HCV NAT yield reduced to thirty four cases (36.6%). Therefore, the NAT yield rate in this donor population for HBV was 1:627; HCV was 1:1051 and HIV at 1:17,861

Conclusions: These results reflect high prevalence of HIV, HBV and HCV infections in northern Indian donor population and clearly indicate the benefits of NAT. The use of ECL technology with higher sensitivity performance for serological screening improved the detection of serology yield for both HBsAg and anti-HCV cases, enabling a more accurate understanding of the NAT yield in this donor population.

Keywords: HIV, HCV, HBV, ELISA, NAT (Nucleic Acid Testing), ECI (Electrochemiluminescence immunoassay).

INTRODUCTION

Nucleic Acid Testing (NAT) for blood screening is an essential component in the process of monitoring blood supply safety in addition to serological testing. Safety and adequacy remain the central goal of donor screening programs.¹ Blood donors can be screened for hepatitis B virus (HBV) in blood donors by testing for hepatitis B surface antigen (HBsAg) and also for antibodies against hepatitis B core antigen (anti-HBc). In the present scenario donors who are positive for HBV DNA are not identified during the window period before seroconversion occurs. Additional measures for making blood safer is through use of nucleic acid testing for detection of the human immunodeficiency virus (HIV), hepatitis C virus (HCV) RNA and HBV DNA.²

The first country which implemented NAT for HBV along with HCV and HIV-1 also observed a significant amount of decrease in transfusion transmission of this virus.³ As a screening tool,

NAT detects infection before serological tests 10-16 days earlier for HIV-1, 49-65 days for HCV, and 25-36 days for HBV.^{4,5} NAT also plays an important role in detecting the incidence of active infection by HIV, HBV and HCV in blood donors. This knowledge is essential as it will determine the policies and guidelines to monitor blood safety.⁵

India is the second most populous nation in the world, with a population of more than 1.2 billion that includes 2.5 million HIV, 43 million Hepatitis B (HBV) and 15 million Hepatitis C (HCV) infected persons. Majority of blood banks in India are employing screening by 3rd generation ELISA and only few have ECI testing.

In this study, we report our experience with NAT during the first twelve months of implementation, to evaluate the risk of transfusion transmitted infections missed by serological screening at Department of Transfusion Medicine, King George's Medical University, and Lucknow. The NAT reactive cases were further screened by ECI technology in order to find out the true NAT yields.

MATERIAL AND METHODS

The work was done in Department of Transfusion Medicine KGMU, Lucknow, U.P this is one of the largest Government sector blood banks in India. The work was approved by the institutional ethical committee. All the blood units were screened by ELISA (hepatitis B surface antigen (HBsAg) by SD HBsAg Kit, hepatitis C virus (HCV) by SD HCV Kit and human immunodeficiency virus (HIV) by SD HIV kit, Bio Standard Diagnostic). A total of 35,722 donations were non reactive by ELISA. These seronegative blood units were tested using the Roche cobas TaqScreen MPX test form from May 2012 till April 2013. This NAT assay performs real-time detection and identification of 5 viruses; HBV, HCV, HIV-1 group M and O and HIV-2. NAT was performed in pools of six and the reactive pools were then resolved to individual donations. Viral target resolution for HIV, HCV and HBV was performed as needed using the respective Cobas MPX Taqscreen assays and discrimination by Cobas Taqman Hepatitis B monitor test, Cobas Taqman Hepatitis C monitor test and Cobas Taqman HIV monitor test. NAT reactive cases were again retested by ECI

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(Cobas e411) using Eclia HBsAg Kit, Eclia HIV kit and Eclia HCV kits in order to find out the true NAT yields.

STATISTICAL ANALYSIS

Microsoft office 2007 was used to make tables. Descriptive statistics were used to interpret results.

RESULTS

NAT screening detected a total of 156 NAT yield donations among 35,722 seronegative donations (non-reactive by serology for HBsAg, anti-HCV and anti-HIV-1 and 2 tests using Alere third generation ELISA Kits). Among these 156 NAT yields cases, 108 (69.2%) were reactive for HBV, 46 (29.5%) were reactive for HCV and 2 (1.28%) were reactive for HIV-1. Upon additional testing using the Roche Elecsys HBsAg II test and Elecsys Anti-HCV assay which employ the electrochemiluminescence technology (ECL); fifty-one of the HBV cases were found to be reactive for HBsAg and twelve cases were reactive for antibodies to HCV. At least twenty one HBV and two HCV NAT yield samples could not be tested by ECL due to insufficient sample volume. As such, total number of valid NAT yield cases was reduced to ninety three cases with fifty seven (61.3%) HBV NAT yield cases and the HCV NAT yield reduced to thirty four cases (36.6%). Therefore, the NAT yield rate in this donor population for HBV was 1:627; HCV was 1:1051 and HIV at 1:17,861 (Table-1).

DISCUSSION

India is a country with a very large population. It has a high prevalence of HIV-1, hepatitis C and B virus which remain undetected in most of the blood donors. NAT has provided a breakthrough and has helped in their detections.

A study by Yang Z et al.⁶ showed that a 80 pools of nucleic acid amplification technology (NAT) were identified which were reactive. Amongst them 59 pools (74%) on resolution proved to be reactive. All these samples were reactive for HBV DNA. A quantitative estimation of viral load in each sample was done. The estimated viral loads were in the range from less than 20 to 34,600 IU/mL. 13 of the samples (22%) showed the value of viral loads of more than 20 IU/mL, 27 samples (45.8%) showed viral loads of less than 20 IU/mL, and 19 samples (32.2%) showed undetectable viral loads. Total of 59 NAT-reactive samples obtained, 40 (67.8%) were anti-HBc positive. Fifteen of the these samples did not show a confirmatory test for NAT reactivity either by an alternative NAT test or serology. While in our study we had a total of 156 NAT yield cases in which 108(69.2%) were reactive for HBV and 23 were not tested due to insufficient volume.

A study by Susan L et.al 2011⁷ reported 9 donors who showed positivity for HBV DNA (1 in 410,540 donations). These

included 6 samples also from blood donors who had received the HBV vaccine or in whom the subclinical infection had already developed but resolved. Of the total HBV DNA-positive donors, probably four of them acquired HBV infection from a sexual partner who was chronically infected. Two of the unvaccinated donors reported clinically significant liver injury. Amongst the 6 vaccinated donors, in 5 of them, a non-A genotype was identified as the dominant strain, while sub genotype A2 (represented in the HBV vaccine) was the dominant strain in unvaccinated donors. Of 75 reactive nucleic acid test results identified in seronegative blood donations, 26 (9 HBV, 15 HCV, and 2 HIV) were confirmed as positive.² While our study showed a total of 156 NAT yields cases, 108(69.2%) were reactive for HBV, 46 (29.5%) were reactive for HCV and 2 (1.28%) were reactive for HIV-1.

Blood safety is a challenge in India because of the high prevalence of HIV, HCV, and HBV, the relatively low percentage of voluntary donors⁸ and the lack of standardization of screening procedures among the multitude of blood collection centres.⁹ Of the 35,722 samples tested from our centre, there were 156 NAT yields donations. Among these 156 NAT yields cases, 108(69.2%) were reactive for HBV, 46(29.5%) were reactive for HCV and 2(1.28%) were reactive for HIV-1. Similar studies in other countries have also demonstrated high yields.^{3,11-17}

A study by Rohit Jain et al., showed that enhanced chemiluminescence immunoassay (ECI) was used for detection of HBsAg, anti-HIV, and anti-HCV in donor serum. Combined NAT yield (NAT reactive/seronegative) for HIV, HCV, and HBV was 0.034% (1 in 2972 donations). All the samples tested were positive for HBV DNA, and the HBV viral load was ≥ 12 IU/mL (95% lower limit of detection, 12 IU/mL with 5.82 copies per IU conversion factor).^{17,18} A study by Xin Zheng et al., showed that a total of 165,371 donor plasma samples from Shenzhen Blood Center were screened as HBsAg negative (HBsAg) with one inter-national and one domestic commercial enzyme immunoassay (EIA) kit. Individual-sample NAT test was performed and thirty three plasma were reported as HBV DNA POSITIVE. Chemiluminescent microplate immunoassay (CMIA) for HBsAg and nested PCR for BCP/PC was done on these 33 samples and amongst them twenty-eight were confirmed as HBsAg and DNA (HBsAg/DNA).¹⁸ In our study out of 156 NAT reactive cases 70 cases were nonreactive by ECI hence were true NAT yields. This comprised of 57(61.3%) HBV, 34(36.6%) HCV and 2(2.15%) HIV. This fact strengthens the support for the use of NAT despite its cost factors. It means preventing the viral spread of these diseases in three times of 70 as 100% component preparation is prevalent in many blood banks.

The potential for NAT yield in India is staggering when compared to other countries that have already implemented the

NAT reactive			ECI not tested		ECI reactive		NAT reactive and ECI non reactive			
	156	%		23		63	133-63=70		70 (NAT reactive and ECI negative) 23 (NAT reactive and ECI not done)	
								70+23=93	93	%
HBV	108	69.2%	HBV	21	HBV	51	70 cases caught to be true NAT yield	HBV	57	61.3%
HCV	46	29.5%	HCV	2	HCV	12		HCV	34	36.6%
HIV	2	1.28%						HIV	2	2.15%

Table-1: Comparison between units tested by NAT (Nucleic Acid Testing) and ECI (Electrochemiluminescence Immunoassay).

technology. Data from studies suggested that the NAT yield for all three viruses in India could be 29 times higher than that observed in Japan, and even higher for HIV-1 alone. Makroo, R.N et al.2008 observed HIV-1 yield was over 515 times that observed in the US and Canada 89 times that observed in Italy, and also observed that HCV yield was 21.5 times that observed in the US and Canada, 26.5 times that of Italy and 125.6 times that of France.^{20,9-16} The higher observed yield in India is not surprising given the prevalence of these viruses in the population; 5.7 million²¹ with HIV, 12 million with HCV²², and 40 million with HBV which represents 10 per cent of the world's HBV infected population.²³ India has reported a high percentage of replacement blood donors associated with higher infection rates compared to voluntary blood donors.²⁴ Many countries, such as Japan and the US, have mostly all voluntary donors^{25,9}

CONCLUSIONS

The introduction of NAT enabled detection of a large number of HIV, HBV and HCV cases in these blood donor samples that were undetected by third generation ELISA serological tests. Annually, 50,000 units of blood are collected in KGMU, based on the current NAT yield reported of 1:384, this translates to 130 NAT yields per year. These NAT results reflect the high prevalence of HIV, HBV and HCV infections in this northern Indian donor population and clearly indicate the benefits of NAT by interdiction of a large number of infected transfusion units and the supply of safer blood to patients. Also, the use of ECL technology with higher sensitivity performance for serological screening improved the detection of serology yield for both HBsAg and anti-HCV cases, enabling a more accurate understanding of the NAT yield in this donor population. Although NAT has detected additional serological window period cases, it should be accompanied by properly selected serological assays for maximizing safety in transfusion practices.

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Genetics Clinical Medicine and Dentistry

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ABSTRACT

William Bateson, coined the terms genetics, genes and alleles³. Genetics can be defined as the study of genes and of the statistical law that govern the passage of genes from one generation to next. New insights into genetic basis of disease are being generated at an ever increasing rate. The explosion of information was ignited by technological advances, such as the polymerase chain reaction (PCR) and automated DNA sequencing and is fueled by rapid progress in the human genome project (HGP).

Although its promise is great, the intergration of genetics into the everyday practice of medicine remains challenging. The great change occurring in medical genetics is that genetic testing may soon be used to test for disease risk/susceptibility to such common diseases as cardiovascular disease, diabetes, and chronic periodontitis.

Keywords: Genetics Clinical Medicine, Dentistry

INTRODUCTION

During the past few decades, the health care professional have become increasingly aware that genetic factors play an important role in clinical medicine and dentistry¹. William Bateson, coined the terms genetics, genes and alleles³. Genetics can be defined as the study of genes and of the statistical law that govern the passage of genes from one generation to next². Genetics abnormalities comprises of disorders due to defect in the genetic system comprising of the genes and the chromosome. Gene in the genetic material DNA, that controls the production of a single protein.³⁻⁵ New insights into genetic basis of disease are being generated at an ever increasing rate. The explosion of information was ignited by technological advances, such as the polymerase chain reaction (PCR) and automated DNA sequencing and is fueled by rapid progress in the human genome project (HGP). Although its promise is great, the intergration of genetics into the everyday practice of medicine remains challenging.⁶

The great change occurring in medical genetics is that genetic testing may soon be used to test for disease risk/susceptibility to such common diseases as cardiovascular disease, diabetes, and chronic periodontitis. It may also be practical to determine individual risk for orofacial developmental anomalies such as clefting, as well as for some forms of cancer such as oral squamous cell carcinoma. Clearly, the expansion of genetic testing to the arena of predictive testing of disease risk, prognosis, and resp Tomorrow's faculty will need a good grounding in genetics to pursue teaching and research careers¹¹. once to therapy will be an important component of health care in the future.¹⁰

HISTORY

The word genetics is derived from the Greek word "Gen" which means "to become" or "to grow into". Discernible pattern of heredity transmission were recognized first in the 18th and 19th

centuries.

In 1750's Maupertius described the autosomal dominant inheritance of polydactyly. First real step in understanding of transmission of the genetic blue print was made by an Augustinian Monk, Gregor Johann Mendel, in 1864.

Conduction hybridization experiment in garden pea (*Pisum sativum*) between 1856 and 1863, he cultivated and tester some 29,000 pea plants from these experiments he deduced some generalizations, which later become known as Mendel's principles of heredity.

Mendel's conclusions were largely ignored, In 1900, however his work was rediscovered by there European scientists Hugo de Verries, Canal Correns and Erich Von Tschermak.

Normal Variation

Individual uniqueness is founded on variation in the sequences of a person's DNA. Some genetic variation is sufficiently common to constitute a polymorphism in the observed phenotype

Example: ABO blood group, HLA systems

Much of this 'expressed' variation arises from single base changes in the DNA encoding biosynthetic enzymes or structural proteins in the cell.

Silent variation: huge amount of pleomorphism in introns and in the tracts of DNA that lie between genes.

Variable Number of Tandem Repeats

Type of polymorphism where the number of units in a repetitive sequence varies between individuals. This is the basis for the science of Genetic Fingerprinting.

Pathological Variation

When DNA change has pathological consequences it is known as Mutation. Mutations are the result of a single base pair changes in the exon sequence of a gene, so that there is an amino acid substitution in encoded protein.

A new type of mutation recently discovered is caused by a sudden and often gross expansion in the number of trinucleotide repeat units in a repetitive sequence.

Special feature of mutation that distinguishes it from normal variation is that the function and/or quantity of encoded proteins is usually substantially disturbed.

Patterns of Inheritance

The most common classification of disorders of inheritance in

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man is:

Mendelian or single gene inheritance

1. Autosomal dominant
2. Autosomal recessive
3. X-linked dominant
4. X-linked recessive.
5. Chromosomal inheritance
6. Polygenic or multifactorial inheritance

Human genetics deals with the variations between humans.

Variations are, in part, reflections of differences that exist at the DNA level. Variations that influence gene function are usually referred to as Mutations. Other variations that do not affect health or functioning of an organism are called *Polymorphisms*. Mutations may arise in somatic cells or germ cells, but only germ cell changes are heritable.

The ever ongoing gene 'experiments of nature' have resulted in a wide variety of mutant phenotypes, which might have remained unknown in lab conditions.

Disorders caused by the transmission of a single mutant gene show either autosomal or sex linked inheritance.

In reality, genes are never dominant or recessive. It is only their protein products that produce clinical patterns called as "Dominant" or "Recessive".

There are approximately 1200 single gene disorders and account for more than 5% of all hospital admissions. Single gene disorders can be classified into autosomal and sex chromosome linked disorders.

Genetic Counselling

Genetic counseling concern with the human problems associated with the occurrence, or the risk of occurrence, of a genetic disorder in the family⁷⁶ In most cases, the individual seeking counseling will already have child or other relative or will himself be affected.

Proper counseling may be given only after correct diagnosis has been established.

For example, after thorough history taking and pedigree analysis a disorder may be shown to be inherited as an autosomal dominant trait in a particular family; the recurrence risk may then be quoted as 50% even though the exact diagnosis is unknown.

The counselor should be able to impart information to the patient and his family in language capable of comprehension. The counselor should try to dispel any notions of guilt, which parents may have after the birth of child with a congenital disorder

PROCEDURES FOR PRENATAL DIAGNOSIS

1. Visualization of fetus

Ultrasonography: With this technique it is now possible to visualize embryo as early as 5 1/2 to 6 weeks of pregnancy and cardiac activity is detectable at 7-8 weeks.

It has now become a routine procedure for verification of viable embryo, determination of gestational age, diagnosis of multiple gestations, determination of placental and fetal positions, diagnosis of fetal anomalies, detection of uterine malformations and a guide for passage of instruments for invasive procedures.

Radiography: Although mineralization of fetal skeleton at 11 weeks of gestation is adequate to permit radiographic examination, this procedure has been discarded due to safety

reasons

Fetoscopy: It has been employed for cannulation of umbilical vessels and for blood sampling, transfusion and fetal tissue biopsies

2. Analysis of fetal tissue

Amniocentesis

- Optimum time: 16-18 weeks of gestation
- Under strict aseptic conditions and local anesthesia, 20-30 ml of fluid is aspirated.
- In less than 0.1% of patients amnionitis (inflammation of amniotic membrane) occurs.
- About 90% of all amniocentesis are performed for cytogenetic analysis. The rest 10% is used for biochemical investigation.
- The fibroblast like cells obtained at amniocentesis can be cultured in a variety of tissue culture media enriched with fetal bovine serum for 1-3 weeks permitting accumulation of sufficient dividing cells for karyotyping.
- A minimum of 15 cells are examined and the modal chromosome number is established.
- Sex determination of fetus is 99% accurate by this method

Chorionic villus sampling

- Optimal time: 9-12 weeks
- the Chorion frondosum contains the mitotically active villus cells and is, therefore, the area to be biopsied.
- At 9-12 weeks of gestational age villi float freely within the intervillous space
- attached only loosely to the underlying decidua, which explains why aspiration sampling at the stage is usually only minimally traumatic
- CVS sampling: 10-25 mg of chorionic villi is collected.
- Because the langerhans cells of the cytotrophoblast are in dividing phase, it is possible to perform a "direct" chromosome analysis, immediately after sampling, or alternately after 24 hours of incubation in a tissue culture medium.
- Direct analysis has the great advantage of permitting a fetal chromosome analysis within 24-48 hou

Fetal and Maternal blood analysis

- Its non-invasive way of prenatal diagnosis. Flow cytometric test of maternal blood with anti gamma globin Mab (Monoclonal antibody to gamma chain of haemoglobin molecule) is highly specific for examining fetal cells irrespective of its gender because the amount of gamma hemoglobin chain produced per cell is significantly higher in fetus in comparison to that of adults.
- This procedure greatly reduces the total number of candidate fetal cell to be sorted by increasing fetal cell purity in the test sample. It has been estimated that a 20 ml sample of maternal blood contains 0.20 fetal cells
- To utilize these rare cells for a prenatal diagnosis of chromosome abnormalities, enrichment techniques are being improvised to make it a standard non-invasive procedure.

Fetal Liver Biopsy

- A variety of enzymes of intermediary metabolism are expressed only in the liver.
- The prenatal diagnosis of disorders associated with

abnormalities of these enzymes cannot be accomplished by enzyme assay of amniotic fluid or chorionic villi cells.

- Thus, fetal liver biopsy is useful in conditions like Type I Glycogen Storage disease etc.

Fetal skin biopsy

- This approach is used only in those disorders where skin is involved eg. Epidermolytic hyperkeratosis.
- Definitive prenatal diagnosis requires that the histological appearance of the skin be pathognomonic at 20 weeks of gestation.

Pre-implantation diagnosis

- In this procedure, 1 or 2 cells are removed from cleavage stage embryos from the patients.
- Affected embryos are identified by using molecular genetic techniques.
- Subsequently, healthy embryos are re-implanted in the uterine cavity enabling further development till full term.
- By doing preimplantation diagnosis, first and second trimester abortions are avoided.
- The couples can decide whether to attempt a pregnancy instead of aborting the fetus at a later stage, thus offering minimal risk to the mother.
- The major problem with this technique at present is low pregnancy success rate

A number of strategies developed to design optimal procedures for the preimplantation diagnosis of genetic defects are:

- Polar Body biopsy
- Multicell biopsy
- Blastocyst biopsy
- Polar Body biopsy

The chromatin of polar body is virtually the "mirror image" of the chromatin of the oocyte. Since the first polar body does not contribute to the development of the embryo it can be removed with minimal adverse effects on the oocyte.

Multicell biopsy: Prior to the late 8-cell stage, 1-3 blastomeres of the pre-embryo are dissociated with pipetting after boring a small hole in zona pellucida, that heals rapidly afterwards.

Blastocyst biopsy: From trophoblast (which later forms placenta) of the blastocyst a number of cells can be safely removed for analysis without adversely affecting the fetus.

BASIC INFORMATION REQUIRED FOR GENETIC COUNSELLING

A genetic counsellor must have:

1. Precise and fully confirmed diagnosis of the disease
2. Accurate pedigree of the family
3. Knowledge of the mode of inheritance of the condition

INDICATIONS FOR PRENATAL DIAGNOSIS

1. Advanced maternal age (e.g; Down syndrome)
2. Previous child with chromosome aberration
3. Intrauterine growth delay
4. Biochemical disorder
5. Congenital anomaly
6. Previous history of Neural tube defect in the family
7. Structural anomalies found on the ultrasonography
8. Person with mental retardation or developmental delay (e.g. fragile X syndrome)

9. Couples with a history of recurrent miscarriages

LATEST ADVANCES IN GENETICS

DNA vaccination

DNA vaccination is performed by directly injecting the plasmid DNA encoding an antigenic protein intramuscularly or intradermally.

The amount of protein produced and expressed in the cell leads to surprisingly a strong immune responses.

Advantages of DNA vaccines

1. They can be easily manufactured at an industrial scale.
2. Different DNA vaccines can be combined and delivered at once.
3. DNA vaccines are more stable and resistant to temperature fluctuations. Thus they can be easily stored and transported.
4. Antigens retain their native form to express potentially. So number of effective doses can be substantially reduced

Disadvantages

1. In spite of its universal acceptance, vaccination is not always an 100% success e.g. Hepatitis B
2. It is very necessary to understand the mechanisms by which DNA induce immune response.
3. There is as yet no way to control excess plasmid that fails to find a way inside the cell.
4. There is a possibility of plasmid disrupting a vital DNA sequence in the host cell.

DNA Chip

- DNA chip is an array of DNA sequences embedded in a gel that layers over a silicon surface.
- It provides a medium for matching the known and unknown DNA samples based on base-pairing rules to identifying the unknowns.
- It may be manual or make use of robotics.

A DNA chip also referred to as DNA array.

Types

Macroarray contain sample sizes of about 300 microns or larger and can be easily imaged by existing gel and blot scanners.

Microarray contain sample spot sizes in less than 200 microns in diameter and require specialized robotics and imaging equipment that generally are not commercially available

Formats of Gene Chips

Format I: probe DNA is immobilized on a solid surface such as a glass using robot spotting and exposed to a set of targets either separately or in a mixture.

Format II: an array of peptide nucleic acid (PNA) probes is synthesized either on-chip The array is exposed to a labeled sample DNA which is hybridized

Applications of DNA chip

1. Drug and receptor discovery in Pharmacogenomics that is therapeutic responses to drugs and the genetic profiles is compared.
 2. Toxicological research in Toxicogenomics
It correlates between toxic responses to toxicants and changes in the genetic profiles.
 3. In diagnostic human pathology
 4. Used to study the aging process in mice.
 5. In the analysis of thousands of genes simultaneously.
- At present, such chips are available only from a single company,

Affymetrix chips USA. of cost \$2,500.

CONCLUSION

As we all know genetics play an important role in health disease. Now with advancement in science its importance in dentistry has become clearer. Its well own by now that genes are the one which determines the genotypic and phenotypic nature of any human being.

Improved method in diagnosis, treatment and prevention has enabled the investigators to focus more of their attention on the role of genetic in oral disorder.

Timely, genetic counseling and better availability of various diagnostic and treatment approach, can lead to attain better oral health.

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Salvation of the Undelying Tooth Structures by Removing of Unaesthetic Fixed Partial Denture with Unusual Techniques: A Case Series

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ABSTRACT

Introduction: The objectives of the removal of any prosthesis by using of techniques are the possibility of reusing it, avoid harming the underlying tooth structures and supporting tissues. The aim of this case series is to demonstrate the different steps for removal of multi-joined crown and unaesthetic bridges from anterior teeth resulting in saving of the underling abutments.

Case report: Three male patients attended to the clinics complained of unaesthetic, unhygienic prosthesis, chipped ceramic, joined metal ceramic maxillary and mandibular anterior teeth.

Conclusions: The crowns/bridges were removed with techniques hereby are described with minimum effect on the abutment teeth and the surrounding oral structures.

Keywords: removal of bridges, destructive techniques, abutment tooth, repair

INTRODUCTION

Metal ceramic (MC) restorations have represented the most widely used restorative technique in fixed partial dentures (FPDs). This popularity may have attributed to high strength properties of the metal, the esthetics of ceramic and their clinical longevity.^{1,2} They have disadvantages such as soft tissue pigmentation and an opaque-to-darkish appearance in the cervical area of the crowned teeth.³

Removal of the cemented prosthesis due to esthetic or biological failures can be challenging, since it may results to harm the surrounding gingival, periodontal tissues, abutment teeth structures.⁴ It becomes more difficult in the presence of multiunit joined crowns/ bridge with unknown path of removal. Factors affect the sectional of cemented crowns/ FPDs are the taper of the preparation, restoration design, cement used, and the selected removal systems.⁵

Since the repair of these prosthesis with any repairing materials or techniques might fail.^{6,7} Such unaesthetic and unpleasant FPDs/crowns need to be removed.

Many techniques and systems have been mentioned in the literature for the safe removal of FPDs.^{5,8-11} These techniques were classified into three categories; conservative, semi-conservative and destructive technique. The destructive technique by mean of sectioning the FPDs with diamond or carbide burs and crown splitters. A combination of more than one technique is useful to remove multiunit crowns and some unusual FPDs. The aims of this case series are to demonstrate the removal of multi-joined, unaesthetic crowns/ bridges from maxillary and mandibular anterior teeth without harming the supporting tooth and the periodontal tissue structures.

CASE SERIES

The patients were informed about the procedures needed for removal of the crowns/ FPDs. After patients a agreements, gross scaling and root planning were done. Then, without local anesthesia, the steps of the removal of the FPDs/joined crowns were started by maxillary arch, which was done in two parts. The steps of removal was started with sectioning of the retainers by making a vertical cut in the middle of the buccal surface of each abutments, started from the crest of free gingival margin to the center or bucco-incisal line angle of the crown. Then extended to the palatal surface using coarse diamond burs (Meisinger, Germany). The sectioning was done as recommended by Rosenstiel et al, 2006.¹² Due to difficulty of removing of the crowns/ bridges by manual back action or spring loaded automatic crown removal, sectioning were extended to involved the connectors between each retainer/ pontics. At the same appointment, the sectioning of the mandibular joined crown was done in the same procedures. A provisional restorations had been constructed with Success SD, Promedica Neumunster, Germany) from the rubber index taken before sectioning of the FPDs. Then cemented with temporary cement (Temp-BondNT, Italy). Chlorhexidine mouthwash 0.20% (INTERMED CHLORHEXIL, Greece) was prescribed as mouth rinse, three times a day for 2 weeks

CASE REPORT # 1

A 59-year old male patient attended to the clinic. His request was to remove old anterior bridges due to unaesthetic problem resulted from composite discoloration after repair of fractured PFM retainer. Furthermore, he complained from gray discoloration appeared at the free gingival margin of the same retainers (Figure-1a). Intraoral examinations showed multiunit joined PFM crowns, extending from tooth # 13 - 23 and from tooth # 33 to 43. Mild gingivitis in the interproximal and embrasure areas with gray pigmentation at the free gingiva of the crowned teeth was obvious. Generalized attrition of occlusal

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surface of all teeth was noticed. The radiographic examination showed multiunit joined MC crowns in the anterior teeth of maxillary and mandibular arch with per- apical pathosis (Figure-1b).

The treatment begun with scaling of teeth including the crowned teeth, also rubber base indexes for maxillary and mandibular crowned teeth were done. Then the steps of removal and sections were done in both arches as seen in (Figure-1c and d). At the same appointment, the sectioning of the mandibular joined crown was done in the same procedures (Figure-1e and f). The removed bridges were collected as small pieces as shown in (Figure-1g). Provisional restorations had been constructed then cemented (Figure-1h).

CASE REPORT # 2

A 49years male patient attended to the clinic complaining of bade esthetic of maxillary anterior teeth. The clinical examination showed broken buccal veneers in relation to tooth # 21 in a

badly design bridge. A generalized gingival inflammation with calculus around the abutment teeth was obvious (Figure-2a). The radiographic examination showed sharp bridge extended from teeth # 13 to 21 as an abutments with teeth # 12 and 11 as pontics (Figure-2b). At this appointment proper scaling and root planning for maxillary anterior teeth was done. Next appointment composite build-up for the broken veneer with good contour was performed until symmetrical anterior teeth was reached (Figure-2c). An index for the anterior teeth and bridge area was done using rubber base (Figure-1d). Sectioning of teeth # 13 and 21, followed by removal of the bridge were done (Figure-2e, f and g). Provisional bridge was cemented (Figure-2h).

CASE REPORT # 3

A 65 years male patient attended to the clinic seeking to replace an existing unaesthetic maxillary sharp bridge. The clinical examination showed over contoured maxillary bridge

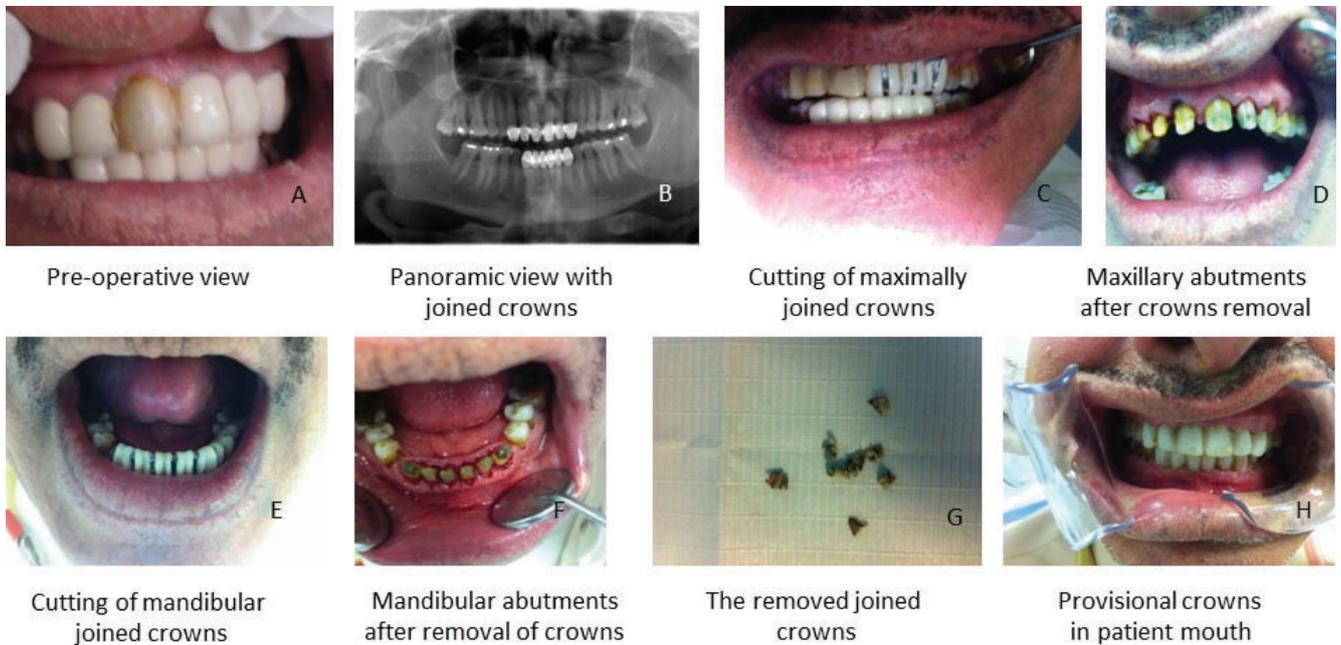


Figure-1: Removal of multi unites joined anterior crowns

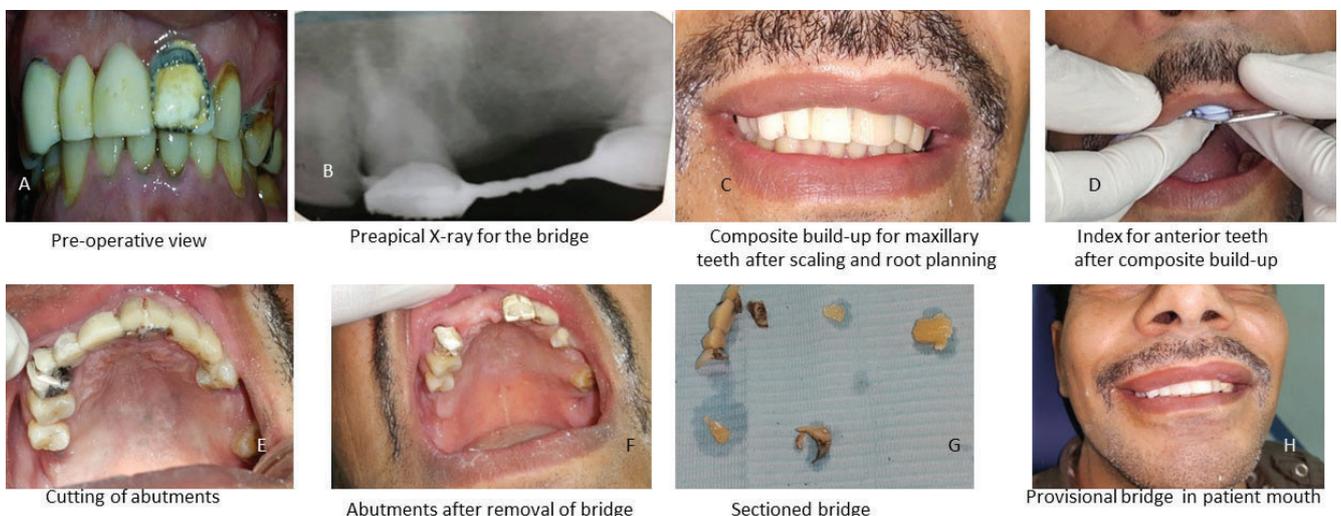


Figure-2: Removal of chipped maxillary anterior teeth

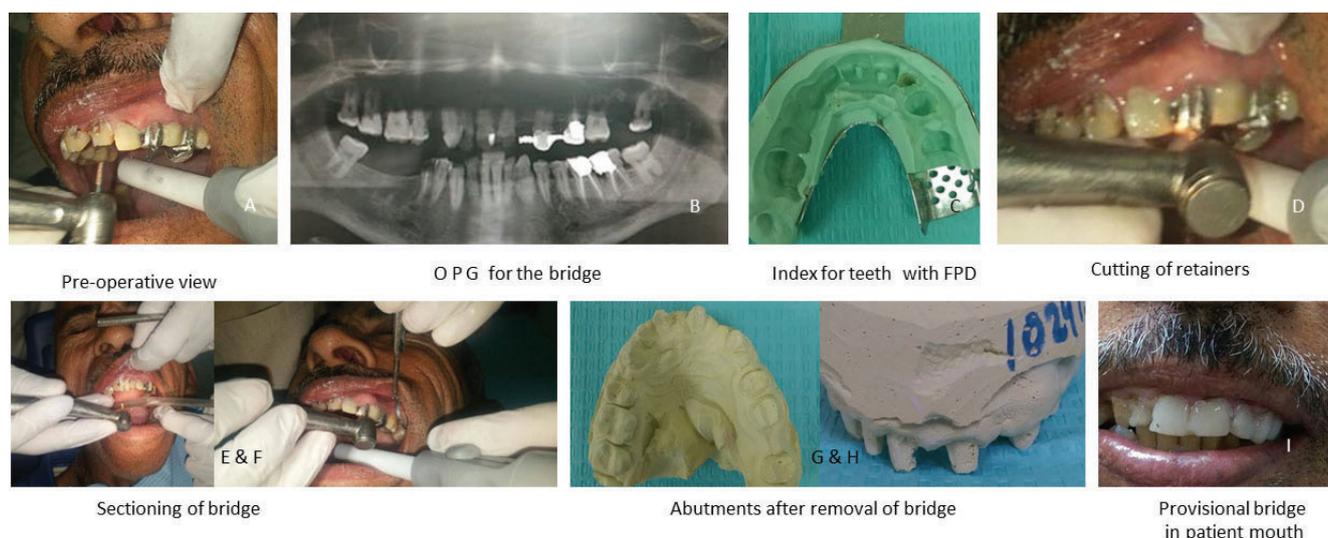


Figure-3: Removal of maxillary unhygienic sharp bridge

extended from teeth # 11, 21, to 24. The gingiva was bleeding upon slight propping and calculus deposits was obvious around all abutments (Figure-3a). The OPG showed bridge extended from tooth # 11to tooth # 24 with teeth #11,21,22 and 24 as an abutments (Figure-3c). Next appointments an index for the anterior teeth and bridge area was done using rubber base (Figure-3c). Sectioning of the abutment teeth, followed by the removal of the pontics were done (Figure-3d- h). Provisional bridge was cemented (Figure-3i).

DISCUSSION

MC restorations have the potential for fracture of the ceramic veneer, which results in a serious cosmetic and clinical problems. It may be desirable to repair broken retainers of a FPDs rather than removing it and the possibility of destroying an entire underneath restorations or/and damaging the abutment teeth.¹³ The fracture of porcelain crowns, particularly on anterior teeth (aesthetic zone), requires a rapid intra-oral repairing with composite which can increase the clinical longevity of failed restorations and offers both dentist and patient a cost-effective alternative to replacements.¹⁴

The failures of FPD can be classified into biological, mechanical, esthetic, functional, iatrogenic, and psychological.^{5,8,10} The unaesthetic and darkness of free gingival color associated with the cemented crowns are the main reasons that lead the patient to remove the prosthesis to avoid the biological effect on the periodontium and abutment teeth.³ Even though the removal of existing FPDs can be traumatic for the patient and stressful for dentists.⁸⁻¹⁰ Also removing of a FPDs without knowing its path of removal and cemented used is a challenging and difficult steps.

The most available systems for FPDs removal in most of dental clinics are, manual back action or spring loaded automatic crown removal. These systems may cause fracture of the cores and extraction of periodontally involved teeth.^{5,8-11} So a modified destructive technique was followed in the removal of these cases, in which a course diamond burs cutes the retainers from the buccal to the lingual passing through the occlusal/insical and in some cases extended to cut the connectors between each adjacent tooth and retainers.

The clinical significant of this cases are, removing of the unaesthetic/ joined multiunit crowns/ FPDs without any effects on the underlying abutments and the supporting periodontium, Since no anesthesia were used, the need of abutment teeth for RCT was diagnosed in an indirect way. Enough time was spent to separate the joined crowns minimizing the trauma to tooth structure and biological tissue in the crowned area. All destroyed prosthesis was replaced by new provisional crowns at the same appointment for aesthetic issue.

CONCLUSION

The destructive technique with its modifications used in these cases was a traumatic, reliable and slight comfort to the patient. It resulted in the removal of all unaesthetic and unhygienic crowns/bridges with minimum trauma to the underlying abutments and gingival or periodontal tissues. Even though it was not easy and time consuming for the clinician, this technique does not require any special, expensive or complex instrument. It is highly recommended to be used in the presence of joined crowns irrespective to the thickness of the connector. In addition to that all patients leaved the clinics with provisional hygienic and esthetic prosthesis in their mouth for aesthetic reasons.

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A Study of the Bacteriological Profile and Antibiotic Sensitivity in Neonatal Septicemia

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ABSTRACT

Introduction: Neonatal septicaemia is one of the leading causes of neonatal mortality in developing countries like India. The bacteriological profile of neonatal sepsis varies from place to place and from time to time. In this study we analyzed the bacteriological profile in neonatal septicemia and their antibiotic sensitivity pattern.

Material and Methods: This was a retrospective study conducted in a Level III Neonatal Intensive Care Unit in South India. The data was obtained from the blood culture and antibiotic sensitivity reports of neonates admitted with septicemia from January'15 to December'15.

Results: There were 144 culture positive isolates. 88% were gram negative isolates. Of the gram negative isolates, Klebsiella was the commonest isolate, accounting for about 70% of neonatal septicaemia. The second commonest isolate was E.coli, which was seen in 13% of cases of neonatal septicaemia. Of the Gram Positive isolates, *S.aureus* isolate was seen 2% of cases and Coagulase Negative Staphylococcus was seen in 4% of cases. There was no isolate of Group B Streptococci in the study period.

Conclusion: Periodic antibiotic sensitivity studies will help pediatricians to choose an appropriate antibiotic for empirical therapy of neonatal septicemia. Paediatricians should also be aware of the rising antibiotic resistances to all commonly used antibiotics.

Keywords: neonatal septicemia, bacteriological profile, antibiogram, resistance

INTRODUCTION

Neonatal Septicemia refers to the presence of microbes or their toxins in blood of neonates. It is diagnosed by a positive blood culture in the first 4 weeks of life. It is one of the leading causes of neonatal mortality in developing countries like India.¹ Neonates are particularly prone for developing sepsis due to factors like immature immune system, prematurity, low birth weight, and maternal infections. The bacteriological profile of neonatal sepsis varies from place to place and from time to time.^{2,3} In the developed countries, group B Streptococcus and E-coli contribute to 70%-75% of cases of neonatal septicemia. Whereas in developing countries like India, Gram negative organisms like Klebsiella remain the major cause of neonatal sepsis.^{4,5} It is necessary to treat neonatal infections empirically by antimicrobial drugs immediately to reduce the mortality of neonates by knowing the epidemiology of bacteria and antimicrobial sensitivity in that particular centre.⁶ Hence an effective surveillance program is needed to formulate an appropriate empirical antibiotic therapy.⁷ The aim of the study is to analyze the bacteriological profile in neonatal septicemia and their antibiotic sensitivity pattern.

MATERIAL AND METHODS

This is a retrospective study conducted in a Level III Neonatal Intensive Care Unit in South India. The data was obtained from the blood culture and antibiotic sensitivity reports of neonates admitted with septicemia from January'15 to December'15. The processing of blood samples for culture and the isolate identification was done by standard methods. All the 144 Isolates were identified by their characteristic appearance, Gram staining and confirmed by standard biochemical tests. The antibiotic sensitivity was also determined according to the guidelines of Clinical and Laboratory Standards Institute.⁸ Institutional ethical committee approval was obtained.

STATISTICAL ANALYSIS

The data were recorded and analyzed using Microsoft Office Excel software and the results were explained in frequency and percentage.

RESULTS

Table-1 shows the pattern isolates. There were 144 culture positive isolates. 88% were gram negative isolates. Of the gram negative isolates, Klebsiella was the commonest isolate, accounting for about 70% of neonatal septicaemia. The second commonest isolate was E.coli, which was seen in 13% of cases of neonatal septicaemia. The Pseudomonas and Proteus isolates were also seen in about 3% and 2% of cases respectively. Of the Gram Positive isolates, *S.aureus* isolate was seen in 2% of cases and Coagulase Negative Staphylococcus was seen in 4% of cases. There was no isolate of Group B Streptococci in the study period.

Table-2 Shows the antibiotic resistance pattern of the

Organism	Number	Percentage
Klebsiella	101	70
E.coli	18	13
Pseudomonas	5	3
Proteus species	3	2
<i>Staphylococcus aureus</i>	3	2
CONS	6	4
Miscellaneous	8	6
Total	144	100

Table-1: Pattern of Isolates

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	Ampicillin	Gentamicin	Amikacin	Ceftriaxone	Ciprofloxacin	Cefotaxime	Ofloxacin	Cefoperazone/ sulbactam	Piperacillin/ tazobactam	Vancomycin
Klebsiella	100	50	29	93	44	86	27	43	40	NT
E.coli	100	28	28	100	28	67	39	50	NT	NT
Pseudomonas	100	80	80	80	60	100	60	80	20	NT
Proteus	NT	100	66	NT	0	100	0	NT	NT	NT
S.aureus	100	66	33	66	66	100	66	33	NT	0
CONS	100	66	33	100	100	100	100	66	33	0

Table-2: Antibiogram of organisms (% resistance)

organisms isolated. All the organisms isolated during the study period showed resistance to Ampicillin. Klebsiella species were more sensitive to Amikacin and Ofloxacin. E.coli was sensitive equally to Gentamicin, Amikacin and Ciprofloxacin. Pseudomonas species was highly sensitive to Piperacillin and Tazobactam combination. *S.aureus* was sensitive to Amikacin and Vancomycin, while CONS was sensitive to Amikacin, Vancomycin and Piperacillin and Tazobactam combination.

DISCUSSION

Septicemia is one of the leading causes of neonatal mortality in developing countries like India. In this present study, Gram negative and Gram positive isolates accounted for 88% and 12% of the cases respectively. Other studies reported in India have reported similar pattern of isolations.^{1,9-11} Among the isolates, Klebsiella was the most common organism followed by Escherichia and Pseudomonas (Table: 1). Many other studies have also reported Klebsiella as the most common isolate.¹² The National Neonatal-Perinatal database also states Klebsiella as the most common (29%) pathogen in neonatal septicaemia.¹³ In case of gram positive isolates Coagulase Negative Staphylococci were the most common, which is comparable with a study by Fler A et al.¹⁴ The gram negative isolates were resistant to most commonly used antibiotics like Ampicillin, and Cephalosporins. Resistance was least with Amikacin and Piperacillin and Tazobactam (Table 2) which is similar to other studies.^{10,15} Similarly Gram positive isolates were resistant to Ampicillin and Cephalosporins. But the gram positive isolates were very highly sensitive to Vancomycin similar to a study by Sudarshan Raj.¹⁵ Contrary to studies from western countries which report many cases of neonatal septicaemia with Group B Streptococci, there was no case of Group B Streptococci isolate in our study.

CONCLUSION

Neonatal septicaemia is a life threatening emergency where appropriate empirical antibiotic therapy will save the neonate. For this the treating paediatrician should be aware of the organisms prevalent in their place and its antibiotic susceptibility. Paediatricians should also be aware of the rising antibiotic resistances to all commonly used antibiotics. Periodic antibiotic sensitivity studies will help paediatricians to choose an appropriate antibiotic for empirical therapy of neonatal septicemia.

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Kerosene Poisoning in Childhood: A 3-Year Retrospective Study at a Tertiary Referral Hospital

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ABSTRACT

Introduction: Kerosene Poisoning is an important and preventable cause of morbidity and mortality in the developing world. Kerosene aspiration may be associated with pulmonary complications and sometimes death. Objectives: To study the clinical profile of children with kerosene poisoning.

Material and Methods: This is a 3 year retrospective study of children admitted with kerosene poisoning in Govt. Dharmapuri Medical College Hospital, Dharmapuri between the years 2013 to 2015. Demographic and clinical data were recorded from the case records.

Results: 150 children were admitted with kerosene poisoning. Male preponderance (64%) was noted. There was seasonal preponderance in the months of April to June. There was also an urban preponderance. The peak age group was from 1 to 3 years. Cough (85%), fever (65%) and vomiting (69%) were the dominant symptoms. Radiologically Right lower lobe infiltration was seen in 30% of children and bilateral lower lobe infiltration was seen in 15% of children. There was one death due to encephalopathy and respiratory failure in the study period.

Conclusion: Kerosene poisoning happens largely due to ignorance of parents. Further research is needed in Kerosene encephalopathy to ascertain whether it is primarily due to direct toxic effect of the hydrocarbon or secondarily due to hypoxia of pneumonitis. Kerosene should be dispensed in child proof bottles with pictorial warnings to deter children.

Keywords: Kerosene, Aspiration, Children, Vomiting, Pneumonitis

INTRODUCTION

Kerosene is a hydrocarbon which still remains as a major fuel used for cooking in rural India. The huge subsidy the Government provides makes it an economical alternative to LPG. Kerosene is usually stored in any household container and is easily accessible to children. Kerosene Poisoning is an important and preventable cause of morbidity and mortality in the developing world.^{1,2} Kerosene has been identified as the most common cause of accidental poisoning in various studies around the world.¹⁻⁶ Ingestion of large quantity of kerosene is rare because of its foul smell and taste. Aspiration of kerosene usually occurs during swallowing and even 1ml of kerosene aspiration may be associated with pulmonary complications and sometimes death.⁷ Low viscosity of kerosene enhances penetration into distal alveoli. Low surface tension facilitates spread over a large area of lung tissue. Experimental toxicological studies have shown that aspirated, and not the ingested, kerosene affects the respiratory system. Signs and symptoms of respiratory involvement appear within 30 minutes after aspiration and progress during the first 1-2 days and then subside in the following one to two weeks.⁸ The complications of kerosene poisoning include hypoxia, pneumonitis, bacterial pneumonia, pneumatocele, pleural effusion, pneumothorax, subcutaneous emphysema and empyema.⁸⁻¹⁰ The usual gastro-

intestinal symptoms of kerosene poisoning are abdominal pain, vomiting and diarrhoea. Its Central Nervous System manifestations include drowsiness and convulsions. The aim of the study is to analyze the clinical profile of children admitted with kerosene poisoning in the Govt Dharmapuri Medical College Hospital, Dharmapuri, Tamilnadu, India.

MATERIAL AND METHODS

This was a retrospective study. All the 150 children with Kerosene poisoning admitted in Govt Dharmapuri Medical College Hospital, Dharmapuri in Tamilnadu, India from January 2013 to December 2015 formed the study group. From the case records data regarding demographic, clinical features and radiological findings of children with kerosene ingestion were collected.

STATISTICAL ANALYSIS

All the signs and symptoms, complications and outcome were tabulated and descriptive analysis was done.

RESULTS

During the study period there were 150 children admitted with kerosene poisoning. All the 150 children were hospitalized in Pediatric Intensive Care Unit with duration of hospitalization ranging from 2-7 days. A male preponderance was observed with 64% of admitted children being males. With regard to age group, 1 to 3 years age group was most affected with about 90% affected children in the study group. About 68% of children hailed from urban area in the study group. The peak incidence of kerosene poisoning was in the months of April to June. In the symptom analysis of kerosene poisoning, the respiratory symptoms dominated the clinical picture. Cough, fever, vomiting and dyspnea were the most common symptoms and signs observed. Fever developed in 65% of patients, the temperature ranging between 38-41°C, with duration from 1-5 days. About 4% of the children had drowsiness and one child had encephalopathy and convulsions. Abdominal pain was reported by 4% of affected children. During the study period one death was observed and it was due to encephalopathy and respiratory failure. In the analysis of x-rays of children affected with kerosene poisoning, about 30% showed right lower lobe infiltration and about 15% showed bilateral lower lobe infiltration. One child had pneumothorax and was managed with

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Characters		No of patients	Percentage
	2013	47	
	2014	51	
	2015	52	
	Total	150	
Sex	Male	96	64%
	Female	54	36%
Age	<1 Year	1	1%
	1-3 Years	136	90%
	>3 Years	13	9%
Residence	Urban	102	68%
	Rural	48	32%
Season	Jan-mar	41	27%
	Apr-jun	46	31%
	Jul-sep	33	22%
	Oct-dec	30	20%

Table-1: Demographic characteristics of children admitted with kerosene poisoning.

Signs and symptoms	No of children	Percentage
Cough	128	85
Fever	98	65
Vomiting	103	69
Dyspnea	58	39
Cyanosis	26	17
Grunting	28	19
Drowsiness	12	8
Convulsions	2	1
Abdominal pain	6	4

Table-2: Distribution of symptoms and signs

Radiological finding	No of patients	Percentage
Right lower lobe infiltration	45	30
Bilateral lower lobe infiltration	23	15
Bilateral peri hilar infiltration	19	13
Normal	32	21
Other lobar infiltration	30	20
Pneumothorax	1	1

Table-3: Chest radiographic findings

Intercostal Drainage.

DISCUSSION

Kerosene poisoning remains as a serious cause of morbidity and occasional mortality in rural India. The peak age group affected was 1 to 3 years as in study by Rashid et al and Anwar et al.^{7,11} This age corresponds to the Oral stage of Psychosexual development of Freud where children put objects into their mouth as a reflex. The present study found an urban dominance in contrast to study by Anwar S and Mahdi AH et al.^{7,12} Similar to studies by L. Nouri and K. Al-Rahim, this study also showed a seasonal preponderance in the months of April to June.¹³ Cough was present in 128 patients (85%), whereas it was found in (83.5%) in Nagi study, (96%) in Mahjoob Al-Naddawi study and (67%) in Shotar study.¹⁴⁻¹⁶ Fever was present in 98 patients (65%), which was (73.8%) in Nagi study and (94%) in Mahjoob Al-Naddawi study.^{14,16} Vomiting after kerosene consumption was seen in 103 patients (69%) of this study. Nagi reported vomiting in (60.6%) and Mahjoob Al-Naddawi

reported vomiting in 90% of cases.^{14,16} In the present study there was no instance of diarrhoea. This is in contrast to other studies which reported diarrhoea in about 4% of cases.^{14,16} Majeed et al reported close relationship between the pulmonary involvement and neurological complications.¹⁷ In the present study 12 children manifested drowsiness and 2 children had convulsions. It can be postulated that the encephalopathy is a result of direct toxic effect of hydrocarbon on the neural tissues rather than encephalopathy developing secondarily after hypoxia. Further research is needed to determine this.

CONCLUSION

Toddlers are more vulnerable to kerosene poisoning mainly because of ignorance on the part of parents to store kerosene properly. The respiratory system is the target organ to be damaged in kerosene poisoning. CNS complications though rare, do occur. Though mortality is rare, we report a single case of mortality due to kerosene poisoning. Further research is needed in cases of encephalopathy that occurs in kerosene poisoning to ascertain whether it is primarily due to direct toxic effect of the hydrocarbon or secondarily due to hypoxia of pneumonitis. Looking at the annual disease burden of kerosene poisoning in India, the Government needs to take concrete steps to prevent innocent children of our country to suffer and succumb to kerosene poisoning. Kerosene should be classified as hazardous chemical. It should be dispensed in containers having pictorial warnings with skull and bones to deter children.

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Prospective Study of Outcomes of Superior Plating for Fractures of Middle Third of Clavicle

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ABSTRACT

Introduction: Clavicle fractures were usually treated by little more than benign neglect. But now, especially for middle one third fractures, open reduction and internal fixation with plate appears to give better functional outcomes. Study evaluated the results after open reduction and superior plate osteosynthesis of fractures of middle one third of clavicle in terms of DASH score, complications and patient satisfaction.

Method and materials: We designed a prospective study between Jan 2014 and Sept 2015 which includes 30 acute fractures of middle one third of clavicle treated with open reduction and internal fixation with plate on superior surface of clavicle. Study population included 10 female and 20 male patients who were followed for 6 months and DASH score was calculated at 12 and 24 weeks.

Results: The average age of patients was 35.17 years with SD 9.79 years (range 19-52 years). The average duration of hospital stay was 7.03 days with SD of 1.35 days (range 5-10 days). Post-operatively 2 had hardware prominence, one had deep infection and one had scar hypertrophy. The average DASH score at 12 and 24 weeks was 15.29 and 8.23 respectively.

Conclusion: Open reduction and internal fixation with plate on the superior aspect of clavicle gives good functional outcomes by reducing the rate of non-union and malunion and restoring the anatomy.

Keywords: Clavicle, Middle third, Superior plating, DASH

INTRODUCTION

Fractures of the clavicle account for upto 5% of all adult fractures.^{1,3} The middle third of clavicle is the thinnest and weakest segment of the bone. Therefore, middle third is the most common site, accounting for upto 81% of all clavicle fractures.^{2,6}

The mode of injury for clavicle injuries in young adults and children is most commonly a high energy trauma like a road traffic accident, sports injury and fall from height. The incidence of the injury has a bimodal age distribution with two peaks, one under 40 years of age and other above 70 years of age.^{1,3-5}

Clavicle fractures were earlier considered to be very forgiving and treated conservatively in most of cases despite high rate of nonunion (15%).⁷ After mid clavicular fracture, distal third fracture occur more frequently (15-20%). The mechanism of injury is common to both the fracture types but fracture of distal third involve more elderly population and is due to simple falls. Earlier clavicle malunion was believed to carry only radiological significance with no functional implications whatsoever.^{1,2,8,9} But now, the malunion of the clavicle has been clearly shown by multiple authors to be a distinct clinical entity with characteristic signs and symptoms that can be significantly improved by corrective osteotomy.^{10,11} It was also shown by

studies that treatment of nonunion of these fractures produce results which are inferior when compared to results of primary operative intervention.¹²

After the dawn of era of AO principles which stressed upon rigid fixation and early mobilization, several techniques of fixation have evolved which include plates, Kirschner wires, Steinman pins, external fixators, Rockwood pins and titanium elastic nails.

Although there is no dearth of studies concentrating on the results of operative treatment, valid and scientific evidence showing primary operative intervention to be superior compared to closed treatment for dislocated fractures, still lacks.¹²

The purpose of this study was to observe the results of osteosynthesis with plate fixation in 30 patients.

MATERIAL AND METHODS

A prospective study was done from Jan 2014 to Sept 2015 at Department of Orthopaedics, Moti Lal Nehru Medical College, Allahabad and Department of Orthopaedics, King George Medical University, Lucknow. We studied 30 cases of fracture of middle third of clavicle which were selected based on inclusion and exclusion criteria and were included in our study after written consent from patient and ethical committee approval of our institutes.

Inclusion criteria: (1) An unilateral middle third fracture of the clavicle. (2) Age between eighteen and sixty years.

Exclusion Criteria: (1) A pathological fracture, (2) An open fracture, (3) A fracture seen more than 4 weeks after the injury, (4) An associated neurovascular injury, (5) An associated head injury (a Glasgow Coma Scale score of <12), (6) An upper extremity fracture distal to the shoulder, (7) Pre-existing shoulder pathology, (8) Unfit for surgery and/or anaesthesia, (9) A lack of consent.

Surgical Technique

We performed all surgeries either in general anaesthesia or regional nerve blocks. Patients were put in supine position with a bolster in interscapular area. Curved incision was given

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along superior border of clavicle. Fracture site was exposed with minimal periosteal stripping and soft tissue dissection. Supraclavicular nerves were protected wherever possible. Bone fragments were reduced and interfragmentary screws were used when needed for compression or butterfly fragment. Fixation was achieved with a precontoured LCP or a 3.5 mm recon plate was contoured to the superior surface of the clavicle. A minimum of 6 cortical purchases were ensured on both the fragments. Closure of wound was done in layers.

Post-op Protocol

Wound inspection was done on fifth post operative day and

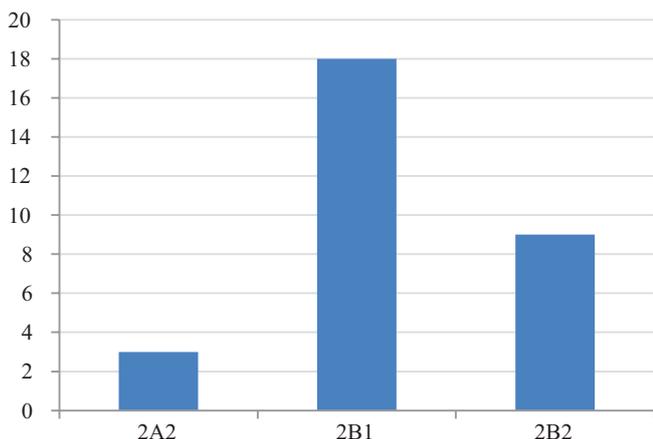


Figure-1: Distribution according to Robinson Classification

patient was discharged if the wound is healthy and patient is comfortable. Suture removal was done after two weeks and patient was allowed gentle active and active assisted exercises of the shoulder. Patient was called for follow up after six week of surgery and a X-ray was repeated. Further follow ups were scheduled at 12 weeks and 24 weeks and evaluation was done both radiologically and functionally in the form of DASH Questionnaire.

STATISTICAL ANALYSIS

Results of the study were based on descriptive statistics. Microsoft Excel 2010® version 2007 was used for calculating standard deviation and mean.

RESULTS

Our study included 10 females and 20 male patients. Thirteen fractures occurred on left side and seventeen on the right side. The mean age of patients was 35.17 years with SD 9.79 years (range 19-52 years). When classified according to Robinson classification, three fell in 2A2, eighteen in 2B1 and nine in 2B1 (Figure-1). Mechanism of injury was fall in twelve, road traffic accident in fourteen and sports injury in four cases. Epidemiological characteristics of the patients are summarised in Table-1.

The mean interval between injury and treatment is 5.1 days with SD of 3.38 days. The average hospital stay was 7.03 days with SD of 1.35 days. Speaking of complications, one patient

S.no	Age	Sex	Occupation	Dominance	Fracture side	Robinson class	Mode of injury
1	38	F	Housewife	Right	Left	2B1	Fall
2	50	M	Government employee	Right	Left	2B1	RTA
3	52	M	None	Right	Right	2A2	Fall
4	23	M	Student	Right	Left	2B1	Sports injury
5	38	M	Businessman	Right	Right	2B2	RTA
6	25	F	Student	Right	Left	2B1	RTA
7	31	M	Labour	Right	Right	2B1	Fall
8	43	F	Housewife	Right	Right	2A2	RTA
9	19	M	Student	Right	Left	2B1	Sports injury
10	29	M	Policeman	Right	Right	2B1	RTA
11	33	F	Housewife	Right	Left	2B2	Fall
12	39	M	Businessman	Right	Right	2B2	RTA
13	44	M	Government employee	Right	Left	2B1	RTA
14	27	M	Student	Left	Right	2B2	Sports injury
15	42	M	Government employee	Right	Right	2B1	Fall
16	39	M	Businessman	Right	Left	2B1	Fall
17	33	F	Housewife	Right	Right	2B1	RTA
18	31	M	Businessman	Left	Left	2B1	RTA
19	27	M	Businessman	Right	Right	2B2	RTA
20	54	F	Housewife	Right	Right	2B1	Fall
21	46	F	Housewife	Left	Left	2B2	Fall
22	23	M	Student	Right	Left	2B1	Sports injury
23	21	M	Student	Right	Right	2B2	Fall
24	29	M	Student	Right	Right	2B2	Fall
25	34	M	Government employee	Right	Right	2B1	RTA
26	31	M	Businessman	Right	Left	2B1	RTA
27	37	F	Housewife	Right	Right	2A2	RTA
28	45	F	Housewife	Left	Left	2B1	Fall
29	23	F	Student	Right	Right	2B2	Fall
30	49	M	Driver	Right	Right	2B1	RTA

Table-1: Epidemiological data of the cases in study



Figure-2: Preoperative and postoperative x-rays and clinical photographs showing range of movement.



Figure-3: (A) Preoperative radiograph. (B) 6 weeks postoperative radiograph. (C) 12 weeks post operative radiograph showing union. (D) Functional outcome at 6 weeks.

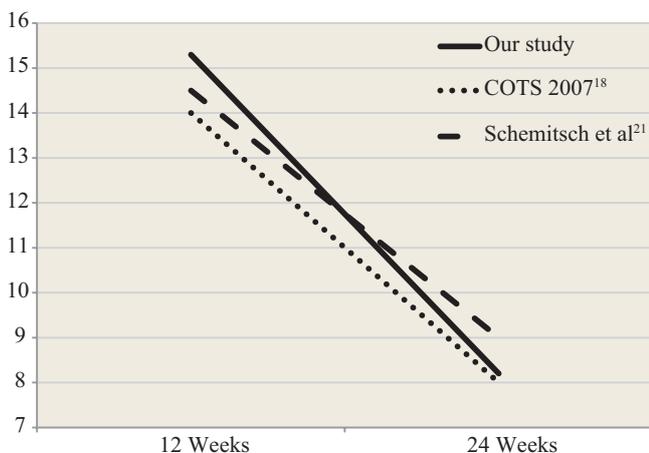


Figure-4: Comparison of DASH scores of our study with two other studies.

had scar hypertrophy, two patients had hardware irritation and one patient had delayed deep infection which was managed by implant removal at 5 months. Mean DASH score after 12 weeks was 15.29 with SD of 1.72 and after 24 weeks it was 8.23 with SD of 1.17. All of the patients were satisfied with the procedure (Figure-2 and 3). Implant loosening, non-union, malunion and implant failure was not reported in any case.

DISCUSSION

Fractures of clavicle are common and are being universally treated conservatively without any differentiation based on fracture configuration or displacement. Conservative treatment is so in vogue that Kreisinger in 1927 found descriptions of over two hundred devices used to treat fractures of the clavicle.¹³ Taylor et al were the first to treat a two month old fracture of

the clavicle with open reduction and encirclage wire in 1905.¹⁴ Recommendations for open reduction and internal fixation of completely displaced fractures of the middle third of clavicle first came from Hill et al in 1997 who reported a non-union in 15% of cases treated conservatively⁷ which was in contrast to previous studies which showed a non-union rate of 0.13-0.71% only.^{2,8} His results were supported by Robinson et al who reported 21% non-union in fractures treated conservatively in 2004.¹⁵

Anterosuperior plating can reasonably be considered the most popular operative method for fixation of the clavicle.¹⁶⁻¹⁸ Its advantages include a general familiarity with this approach in most surgeons' hands, the ability to extend it simply to both the medial and lateral ends of the clavicle, and the benefit of clear radiographic views of the clavicle postoperatively. These advantages come with a higher risk of injury to underlying vital structures but this can be avoided with meritorious drilling avoiding any overshooting of the drill.

In our study 66.7% patients were male and 33.3% female with a mean age of 35.17 years. In study by Canadian Orthopaedic Trauma Society¹⁸, 61% were male and 39% female with mean age of 33.5 years. We found Road traffic accidents to be the most common cause (14 cases, 46.7%) followed by fall. COTS also reported motor vehicle accidents to be the most common cause.

Robinson class 2B1 fractures were most common (18 cases, 60%) followed by 2B2 fractures (9 cases, 30%).

In our study, union rate was 100% and none of the cases had symptomatic malunion. Previous studies also shown a non-union rate of 0%-3.23%.¹⁸⁻²⁰

The DASH score at 12 weeks and 24 weeks follow up in our study was 15.29 ± 1.72 and 8.23 ± 1.17 respectively. The score

s. no	Age	Sex	Injury treatment interval	Hospital stay	DASH score at 3 months	DASH score at 6 months
1	38	F	5	7	13.2	7.2
2	50	M	2	9	14.5	6.8
3	52	M	8	7	14.6	7.6
4	23	M	2	5	15.1	7.7
5	38	M	1	7	18.7	9.4
6	25	F	3	9	16.7	10.2
7	31	M	5	8	14.5	9.4
8	43	F	4	7	13.8	8.6
9	19	M	6	5	13.2	6.8
10	29	M	4	10	17.3	7.8
11	33	F	2	7	13.4	7.2
12	39	M	5	5	14.7	8.1
13	44	M	3	6	15.2	9.7
14	27	M	4	8	15.6	9.4
15	42	M	2	5	16.3	7.4
16	39	M	5	7	13.7	7.9
17	33	F	3	9	14.1	8.2
18	31	M	12	6	13.9	9.6
19	27	M	6	8	15.4	10.3
20	54	F	9	5	16.9	8.9
21	46	F	16	7	15.7	6.7
22	23	M	11	7	14.9	6.9
23	21	M	5	7	17.2	7.6
24	29	M	4	8	16.3	9.4
25	34	M	2	6	19.6	10.5
26	31	M	1	9	14.7	8.5
27	37	F	7	7	14.5	7.8
28	45	F	5	7	13.6	6.8
29	23	F	6	6	13.2	7.4
30	49	M	4	7	18.4	7.2

Table-2: Functional Outcome of the cases in study

was comparable to that found in previous studies^{18,21} (Figure-4). We, based on our study, came to know that open reduction and internal fixation of fractures of middle third of clavicle gives good functional outcomes and patient satisfaction while decimating the rate of non-union. However small sample size and short duration of follow up were the main limitations of our study and will need studies with larger sample and longer follow up to further prove our results.

CONCLUSION

It is common practice to treat all the fractures of clavicle conservatively but internal fixation with plate after anatomical reduction gives excellent results in terms of early union, low rate of non-union, good functional status and a happier patient.

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Vibration Perception Threshold as a Measure of Distal Symmetrical Neuropathy in Type 2 Diabetes

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ABSTRACT

Introduction: The prevalence of diabetic is increasing worldwide due to its chronic progressive behaviour and its complications. Among the complications incurred by diabetic, nervous system is most commonly and frequently affected. Although all types of peripheral nerves can be involved, it is usually sensory dominant with eventual involvement of motor nerve fibers. VPT (Vibration Perception Threshold) as a stand-alone method for identifying distal symmetrical peripheral neuropathy relative to gold standard assessments involving neurology examinations and nerve conduction studies. Early detection of diabetic neuropathy in diabetic patients is essential to decrease morbidity

Material and Methods: In this study we determined VPT and nerve conduction along with signs and symptoms of peripheral neuropathy in 30 subjects with type 2 diabetes.

Results: In the study we found VPT as a reliable measure of DSPN (Distal Symmetrical Poly Neuropathy) and a sensitive and specific measure of definite clinical neuropathy with the highest sensitivity noted for definite clinical neuropathy (74.07%). The sensitivity of VPT to predict abnormal nerve conduction and confirmed clinical neuropathy was 50%.

Conclusion: From our study we conclude VPT as a sensitive indicator of definite clinical neuropathy but this analysis do not address the utility of VPT as a measure of disease severity or the ability of VPT to measure change in neuropathy status over time.

Keywords: Diabetes, Vibration Perception Threshold, Distal Symmetrical Poly Neuropathy.

INTRODUCTION

Quantitative determination of vibro-tactile thresholds has been proposed as a method to assess the somato-sensory pathways that transmit information induced by Cutaneous vibratory stimuli.¹ In comparison with testing of vibration with a tuning fork, the quantitative method for measuring vibration perception thresholds (VPT) has shown reliability, primarily because the equipment used minimizes the subjectivity of the examiner.² The prevalence of diabetic is increasing worldwide due to its chronic progressive behaviour and its complications. Among the complications incurred by diabetic, nervous system is most commonly and frequently affected.³

Although all types of peripheral nerves can be involved, it is usually sensory dominant with eventual involvement of motor nerve fibers.⁴ Distal symmetrical polyneuropathy (DSP), which predisposes patients to variable pain, sensory disturbance, motor dysfunction, ulcers, and gangrene, is the most common type of diabetic neuropathy.⁵⁻⁷ Quantitative sensory testing (QST) consists of several non-invasive, standardized tests aimed at examining different aspects of the entire somato sensory nervous system. QST has many advantages over the electromyography such as the ability to test the function of thin and unmyelinated nerve fibers as well as the subjective

sensation of a somato sensory stimulus.⁸ In the present study we evaluate the performance of VPT as a stand-alone method for identifying distal symmetrical peripheral neuropathy relative to gold standard assessments involving neurology examinations and nerve conduction studies.

MATERIAL AND METHODS

Vibration perception threshold (VPT) testing was determined in 30 adults with type 2 diabetes mellitus with > 10 years of diabetes. Before taking sample informed consent was taken from the subjects and ethical clearance was taken from the institutional ethical clearance committee. Subjects were taken in the study only by taking following inclusion and exclusion criteria:-

Inclusion criteria

- i) Subjects having history of type 2 diabetes mellitus with more than 10 years of duration.
- ii) Subjects above 35 years of age.

Exclusion criteria

- i) Subjects having amputated limbs\gangrene.
- ii) Subjects having neuropathy due to causes other than diabetes.

VPT was assessed using the Diabetic Neuropathy Analyzer (Bio star Health Care).

The device produces vibration amplitudes from 0.005–200 microns, expressed as vibration units (0.005microns =0.1 vibration unit; 200 microns=20.0 vibration units), with a higher vibration unit value indicating worse performance or greater sensory dysfunction. First probe was applied to patient's hand to explain the feet of vibration clearly. Then patient is asked to concentrate on feet & tell as soon as he starts feeling the vibration and value is noted. In the present study average of 6 specific points in both feet were taken for analysis and these points were:-

- Great toe
- 1st metatarsal
- 3rd metatarsal
- 5th metatarsal
- Instep
- Heel

Subjects were unaware of the device settings.

Every incorrect response increased the vibration intensity by

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10% and each correct response lead to decrease in the intensity by 10%. Stimuli at vibration units of <1.0 were repeated before increasing or decreasing the vibration intensity. If there were 5 errors made by the subject over a minimum of 18 trials, the test was stopped. Vibration units corresponding to the subject's first five errors and the five lowest correctly identified vibration units were rank ordered; the highest and lowest of these 10 were discarded.

The first, definite clinical neuropathy, indicate the presence of symptoms and signs consistent with DSPN based on history and physical examination by a board-certified neurologist. The second, abnormal nerve conduction represents one or more abnormal nerve conduction results (amplitude, conduction velocity, or F response latency) in two different peripheral nerves among the median (sensory or motor), peroneal motor, or sural sensory studies. Finally, confirmed clinical neuropathy was defined as the presence of both definite clinical neuropathy and abnormal nerve conduction.⁹⁻¹¹

STATISTICAL ANALYSIS

Qualitative data was represented in groups and were compared using chi square tests for categorical variables. The Cohen k measured agreement between two methods.

RESULTS

Characteristics of the 30 subjects with both DSPN and VPT Assessment (data as n %) are shown in Table-1.

DSPN prevalence among all subjects was highest when defined by Definite clinical neuropathy (76.6%). Abnormal nerve conduction was present in 33.3% of subjects and confirmed clinical neuropathy in 33.3% of subjects. There was significant relationship between abnormal nerve conduction test and VPT ($p < 0.005$). Also there was significant relationship between confirmed neuropathy and VPT ($p < 0.05$). However, there was no significant relationship between definite clinical neuropathy and VPT, as shown in table-2

Characteristic	Total Cohort
Number of Subject (n)	30
Definite Clinical Neuropathy (%) (23/30)	76.6
Abnormal Nerve Conduction (%) (10/30)	33.3
Confirmed Clinical Neuropathy (%) (10/30)	33.3

Table-1: Characteristics of Subject

	Chi square test of categorical variables with VPT
Definite Clinical Neuropathy	Non-significant
Abnormal Nerve Conduction	Significant
Confirmed Neuropathy	Significant

* $p < 0.05$ is taken significant.

Table-2: Relationship between vibration perception threshold (VPT) with all the three distal symmetrical polyneuropathy (DSPN)

Total subjects (n=30)	Sensitivity	specificity	Positive predictive value	Negative predictive value	K
Definite clinical neuropathy (23)	74.07	100	30	0	.857
Abnormal nerve conduction (10)	50	100	50	0	.200
Confirmed clinical neuropathy (10)	50	100	50	0	.200

Table-3: Showing vibration perception threshold (VPT) a sensitive predictor of all three Distal symmetrical Polyneuropathy (DSPN)

VPT was a sensitive predictor of all three DSPN outcome measures (Table-3), with the highest sensitivity noted for definite clinical neuropathy (74.07%). The sensitivity of VPT to predict abnormal nerve conduction and confirmed clinical neuropathy was 50%. Specificity of VPT for abnormal nerve conduction, definite and confirmed clinical neuropathy was 100% (Table-3).

The PPV of VPT was higher for abnormal nerve conduction (50%) and confirmed clinical neuropathy (50%) (Table-3). k values indicated good agreement between VPT and definite clinical neuropathy, k values indicated at least fair agreement between abnormal nerve conduction, confirmed clinical neuropathy and VPT.

DISCUSSION

We determined VPT and nerve conduction studies along with signs and symptoms of peripheral neuropathy in 30 subjects with type 2 diabetes. We found that VPT was a reliable measure of DSPN and a sensitive and specific measure of definite clinical neuropathy. VPT tests at foot were performed concurrently with detailed neurological assessments and electrophysiological studies. VPT testing was performed on the same day as the subject's neurological assessment and electrophysiological studies to minimize temporal variability when results were compared. Sensitivity of VPT with definite clinical neuropathy was highest. With k as another measure of agreement, VPT had good agreement with definite clinical neuropathy but at least fair agreement with abnormal nerve conduction and confirmed clinical neuropathy. Abnormal nerve conduction was more prevalent than definite clinical neuropathy therefore; the PPV of VPT was highest as a measure of abnormal nerve conduction. In previous studies it was found that VPT may provide important, clinically meaningful information about large nerve fiber dysfunction in diabetes.¹²

In another study common criticism of VPT testing are that it is not sufficiently specific to large fiber or even to peripheral nerve dysfunction, that the results are influenced by subject attentiveness, motivation, and fatigue. VPT testing are simple, quick, painless, and generally well tolerated and are unaffected the presence of foot callus or by limb temperature.¹³⁻¹⁶ In another study it was shown that VPT at the great toe is a sensitive predictor of both definite clinical neuropathy and confirmed clinical neuropathy. Because sensory examination of large nerve fibers (e.g., vibration and position sense) is a component of the neurologists' evaluation, this finding is not unexpected. VPT was a less sensitive indicator of abnormal nerve conduction.¹⁷ Overall, the sensitivities obtained in our study compare favorably to those of others who have reported sensitivities between 58 and 84% for VPT¹⁸⁻²¹ measured by a variety of test devices and test methods. Early detection of DN is essential for the initiation of potential preventative measures, patient education, and evaluation of therapeutic options. Patient education concerning foot care may make a substantial impact

on reducing the inherent morbidity of DN.²²

CONCLUSION

From our study we conclude VPT as a sensitive indicator of definite clinical neuropathy but this does not mean that VPT can be used as a measure of disease severity or the ability of VPT to measure change in neuropathy status over time. Future researchers may choose to select VPT cut of points for defining abnormalities based on the population studied and clinical outcome of interest.

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Surgical Outcome of Congenital Heart Disease Cases: A single Unit Analysis in an Upcoming Centre in Eastern Uttar Pradesh, India

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ABSTRACT

Introduction: These days with the advancement in science and technology and also increasing expertise, the surgical outcome of congenital heart disease (CHD) is very promising. On an average around 2 Lakhs (0.2 million) children are born in India every year with CHD, whereas approximately 25000 surgeries are done every year for CHD in India. With this background and considering the tremendous need of congenital heart surgery but with limited infrastructure and manpower we started our congenital heart surgery programme. This study was conducted to audit our congenital heart surgery programme in very limited infrastructure and also to help decrease the burden of this increasing disease load.

Material and Methods: This study was done over a period of four and half years and 109 cases of CHD were operated. We observed the age, sex, type of surgery, morbidity, mortality and hospital stay etc.

Results: In our study, 64 % of patients were between the age of 10 to 40 years. Male and female distribution was almost equal. Most common surgery performed was atrial septal defect closure, followed by patent ductus arteriosus ligation. There was one mortality (.09%) and morbidity requiring major intervention was seen in 3.66 % cases. Average hospital stay was 12 days.

Conclusions: In spite of our shortcomings, surgical outcome in our series is comparable to other centres.

Key words: Congenital Heart Disease, outcome, surgery, paediatric cardiac surgery, upcoming

Birth incidence of structural congenital heart disease is between 10-15/1000 live births.³⁻⁵ With this estimate on an average around 2 Lakhs (0.2 million) children are born in India every year with CHD, whereas approximately 25000 surgeries are done every year for CHD in India. Thus every year a large number of children suffering from CHD are added in already existing massive disease pool. Ventricular septal defect is the commonest CHD, followed by Atrial septal defect. In cyanotic group, Tetralogy of Fallot is the commonest subgroup.⁶ CHD is the most common congenital problem in children accounting for nearly 25% of all congenital malformations.⁷

With this background and considering the tremendous need of congenital heart surgery but with limited infrastructure and manpower we started our congenital heart surgery programme in June 2011 at our unit along with an active adult cardiac surgery and thoracic surgery programme. We retrospectively analysed our surgical outcome in terms of morbidity and mortality.

Eastern Uttar Pradesh has no cardiac surgery centre where congenital hearts are operated on a routine basis. Adjoining state of Bihar, which drains to our hospital also has no such programme. This area in spite of having the maximum population density in India, is totally devoid of congenital heart surgery facility. With this in mind, we started our congenital heart surgery programme to demonstrate that such complex procedures which may involve high morbidity and mortality in hospitals with limited infrastructure with special attention in selection of cases. Our aim was to demonstrate that such programmes can be successfully started in all government medical colleges with basic infrastructure for cardiac surgery.

MATERIAL AND METHODS

This study was conducted in the Department of Cardiothoracic and Vascular Surgery, Institute of Medical Sciences and SS Hospital, BHU Varanasi. Total 109 cases of congenital heart disease were operated over a period of four and half years (June 2011 to Dec 2015) in our unit as per the operation theatre records. All the patients who underwent such procedures for congenital heart disease were included. In this series we have not accepted

INTRODUCTION

Congenital heart disease (CHD) refers to the presence of a structural abnormality of the heart and / or great vessels that is present at birth and is of actual or potential functional significance.¹ With advancement in technology and surgical expertise the management of congenital malformations of the heart has improved tremendously in the developed world such that even very complicated lesions are now being treated with high success rates.² The situation in many of the developing countries is very different as only very few children born with congenital heart disease are properly diagnosed at correct time and then receive timely treatment. Most of them suffer high morbidity and mortality. This is due to several factors that may be considered obstacles or challenges for congenital heart disease management in these regions. Thus, thousands of children die, many undiagnosed, each year from congenital heart disease, while millions more remain in desperate need of treatment in the these regions, even after diagnosis. Alleviating the sufferings of such children and their families is a major challenge to our health system.

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babies below 15 kg of weight, except for PDA ligation. The most complex of cases we did were Tetralogy of Fallot (TOF) with good pulmonary artery anatomy, more complex cases were referred to higher centre for further management. Necessary ethical approval and informed consent were taken.

The following points were noted about patients.

1. Age of patient
2. Sex
3. Type of congenital heart defect
4. Type of surgery
5. Morbidity and mortality
6. Follow up

Age group	No of patient with CHD	Percentage
0 To 5 years	18	16.5
5 To 10 years	19	17.4
10 To 18	34	31.1
18 To 40	36	33.02
>40	2	.01
Total	109	

Table-1: Age of patient

	Numbers	
Male	58	53.21 %
Female	51	46.78 %
Total	109	

Table-2: Sex of patient

S no	Type of disease	Operative procedure	Number	Percentage
1	Ostium secundum ASD	pericardial patch closure of defect	33	30.27
2	sinus venosus atrial septal defect	pericardial patch re-routing	06	5.5
3	Ventricular Septal defect	synthetic patch closure	08	7.3
4	Patent Ductus Arteriosus	triple ligation	20	18.34
5	Tetralogy of Fallot	intra cardiac repair	11	10.09
6	Pentalogy of Fallot	intracardiac repair	2	1.83
7	Partial AV canal	intracardiac repair	3	2.75
8	ASD with moderate to severe mitral regurgitation	ASD closure with mitral repair (ring annuloplasty)	5	4.58
9	ASD with severe mitral stenosis	ASD closure with mv replacement	2	1.83
10	VSD with valvular pulmonary stenosis	VSD closure with pulmonary valvotomy	3	2.75
11	Double chambered right ventricle	intracardiac repair (ICR)	3	2.75
12	Total anomalous pulmonary venous connection with ASD	intracardiac repair	1	.09
13	Sub aortic membrane	Resection	1	.09
14	Abnormal right coronary artery from pulmonary artery	Right coronary artery translocation to aorta	1	.09
15	Combination of septal defects with or without PDA/PS	intracardiac repair	10	9.17

Table-3: Type of congenital heart disease and surgery

Morbidity				
S. No	Type of morbidity	No of cases	Management	Percentage
1	Postoperative mediastinal bleeding	2	Re exploration done	1.8%
2	patch dehiscence in			
	ASD with chronic constrictive pericarditis	1	conservative	1.8%
	partial AV canal	1	re do surgery	
Mortality				
1	Intra Cardiac repair for DCRV with VSD with PDA	1	Right ventricular dysfunction leading to low cardiac output	.09%

Table-4: Morbidity and Mortality

STATISTICAL ANALYSIS

All data were fed in Microsoft Excel for analysis. Descriptive statistics including mean and percentage were used to infer results.

RESULT

Most of our congenital heart surgery patients were between 10 to 40 years of age, with around one third of them in adult age group, thus showing the failure of early detection and lack of surgical facilities. (Table-1). Male and female patients were almost in equal distribution. (Table 2).

We operated a variety of CHD (Table-3). ASD, PDA and TOF dominated the series with they accounting for about 60% of all cases.

We had one mortality (Table-4) in our congenital heart surgery series. She was a girl child, aged eight years suffering from double chambered right ventricle with VSD and PDA. We lost the child on third post-operative day due to right ventricular failure.

We had two post-operative mediastinal bleeding requiring re exploration. Both patients recovered normally. Two cases of patch dehiscence were also encountered. Both patients came with symptoms one month after discharge. The cause was infection in both cases. They underwent redo surgery to stabilize the problem (Table-4).

All our patients are under routine follow up. After discharge they are advised to attend OPD after one week, one month,

three month, six month and then on yearly basis. All patients are followed with Echo Cardiogram before discharge and after one month of discharge. Two patients with VSD closure had less than 2 mm size residual VSD with hemodynamically insignificant shunt. All mitral repairs had mild residual mitral regurgitation. In intra cardiac repairs for TOF, three patients needed trans annular patch thus having moderate to severe pulmonary regurgitation. Rest all ICR for TOF achieved good hemodynamic correction. Average hospital stay for our patients were 12 days.

DISCUSSION

Our is a new unit which is trying to establish open heart surgery programme in a tertiary care centre of northern India. We are the only government centre between Lucknow and Kolkata, a distance of 1000 kms, doing open heart surgery and congenital heart surgeries on a regular basis. This results in huge OPD load of pre-operative patients. But due to severe shortage of trained manpower, operative days and other infrastructure, our unit still struggles to take up all the cases that come to us. Also our unit is not exclusive CHD surgical unit. For about 3200 CHD cases that came to our unit OPD in this period, we were able to operate only 109 cases. Our desire is to achieve a congenital heart surgery programme with low morbidity and mortality so public develops faith in this programme and the perception that cardiac surgery cannot be done in children is changed and this programme becomes more acceptable. The goal was to utilize our limited manpower and resources to save maximum lives, thus we referred cases with high per and postoperative risk to higher centres.

We plan to accept more complex of congenital heart surgery cases as our manpower, infrastructure and experience grows. Some of the limiting factors our unit faces are:

1. Average 5 operating days in a month.
2. Only one dedicated cardiac surgery OT, with facility to do only one major case per OT day.
3. Burden of other cases including adult cardiac surgery, thoracic and vascular surgery plus other emergencies.
4. Limited number of ICU beds (two per unit)
5. No Senior Residents. We have junior residents from general surgery who come on a rotation basis for two months to assist us.
6. Shortage of nursing staff (One staff per six beds in ICU).

In this series we have not accepted babies below 15 kg of weight, except for PDA ligation. The most complex of cases we did were Tetralogy of Fallot (TOF) with good pulmonary artery anatomy. We performed CT pulmonary angiography in all TOF patients and calculated McGoon ratio. Cases with McGoon ratio above 1.5 were taken up for intra cardiac repair. Also TOF patients with large major aorto pulmonary collateral arteries were not taken up. Case selection is very important for any upcoming cardiac surgical unit in a government set up, with limited resources. The aim should be to lay a solid foundation on which one can build a castle in future.

Congenital heart surgery data from around the globe shows that mortality rates are now less than 5% in most of the well-established centres, which are doing the most complex of congenital heart surgery procedures.⁸⁻¹⁰

Stark J et al⁸ in their article found that overall mortality rate for all operations was 4.0% (95% CI 3.0-5.2). No deaths occurred for 67 arterial-switch operations. Mortality rates for coarctation, ventricular septal defect, atrioventricular septal defect, Fallot,

and truncus arteriosus operations were 1.1%, 0.6%, 3.6%, 2.3%, and 28.6%, respectively. Although overall mortality rates between surgeons varied (1.6-6.9%), no surgeon's were higher than the 95% CI.

Edward L. Hannan¹¹ in their article concluded that both hospital volume and surgeon volume are significantly associated with in-hospital mortality, and these differences persist for both high-complexity and low-complexity paediatric cardiac procedures. In their publication they reported a mortality rate of 8.77% for surgeons with annual congenital heart operations less than 75.

CONCLUSION

In India we need urgently to establish such congenital heart surgery centres in every district, so that ever increasing CHD case load is decreased. The day will not be far when after control of infectious disease mortality, CHD will become as number one cause of mortality in children. Ours is small effort in this direction.

In spite of our shortcomings, surgical outcome in our series is comparable to other centres.

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A Comparative Study to Evaluate the Efficacy of Magnesium Sulphate Combined with Thiopentone Sodium or Propofol For Attenuation of Haemodynamic Response to Electroconvulsive Therapy

Prashant Pawar¹, Charulata Deshpande²

ABSTRACT

Introduction: ECT is widely used for treatment of severe psychiatric disorders. Although general anaesthesia has added to the patient safety and comfort, the haemodynamic pressor and neuroendocrine response associated with ECT remains a major concern due to associated cardiovascular morbidity. MgSO₄ has unique pharmacological properties making it an important alternative for attenuation of pressor response to ECT. Present study was done to evaluate the efficacy of IV MgSO₄ for attenuation of haemodynamic response to ECT when used in combination with propofol or thiopentone Na.

Material and Methods: In this prospective, randomized, double blind study we evaluated the efficacy of IV MgSO₄ (30mg/kg) for attenuation of haemodynamic response to ECT when used in combination with Propofol or Thiopentone Na in 100 ASA I and II patients. We also evaluated time taken for spontaneous respiration, seizure duration and incidence of adverse effects.

Results: MgSO₄ + Propofol combination effectively attenuates of both hypertensive and tachycardic response to ECT. MgSO₄ + Thiopentone Sodium combination effectively attenuates hypertensive response but not heart rate response. The difference in the post ECT heart rate and rate-pressure product between the two groups is statistically highly significant (p<0.01). MgSO₄ did not prolong the action of succinylcholine. Although Propofol shortened the duration of seizure, the duration was within therapeutic range.

Conclusion: MgSO₄ + Propofol is a useful and effective combination for attenuation of ECT associated haemodynamic pressor response.

Keywords: Electro convulsive therapy (ECT), Haemodynamic response, Magnesium Sulphate, Thiopentone Sodium, Propofol

INTRODUCTION

Electroconvulsive therapy (ECT) is widely used in the treatment of severe psychiatric disorders. In the early days, ECT was often conducted without the benefits of general anaesthesia and neuromuscular blockade leading to physical and psychological trauma. Better understanding of physiology of ECT, improvement in ECT machines and technique, greater attention to anaesthetic management and preparation for emergencies has resulted in a high level of safety for ECT.

The haemodynamic pressor and neuroendocrine response associated with ECT includes an initial parasympathetic discharge causing transient bradycardia for 10-12 seconds followed by an intense sympathetic discharge resulting in tachycardia, hypertension and a risk of arrhythmias for 5-7min.¹⁻³ This response is undesirable in normal patients and is harmful to patients with ischemic heart disease, hypertension

and cerebrovascular disease.

A wide variety of drugs have been used with varying degrees of success in attenuating the acute haemodynamic response associated with ECT. Magnesium sulphate (MgSO₄) has been successful in attenuation of the pressor response to intubation.⁴⁻⁶ and pneumoperitoneum.⁷ MgSO₄ is vagolytic in nature and increases pulse rate. We hypothesized that MgSO₄ would be useful in the setting of ECT and more effective if combined with Propofol, a vagomimetic induction agent.

The purpose of this study was to evaluate the efficacy of IV MgSO₄ 30 mg/kg for attenuation of the haemodynamic response to ECT and also to compare its combination with two short acting induction agents, Propofol or Thiopentone Sodium in attenuating the pressor response.

MATERIAL AND METHODS

After obtaining approval from hospital ethics committee and written, informed valid consent from the guardian (Parent / Sibling / Spouse), 100 ASA grade 1 and 2 patients between the age of 18-55 years, undergoing ECT session for a variety of psychiatric conditions were enrolled in this randomized, prospective, double blind study. Using computer generated randomization each patient was assigned to one of the two groups. Group T (T+M) received Thiopentone Sodium + Magnesium Sulphate and Group P (P+M) received Propofol + Magnesium Sulphate as part of induction. The study excluded patients with history of controlled and uncontrolled hypertension, Myocardial infarction in previous 6 months, Atrial fibrillation, Atrial flutter, Heart block or any other arrhythmias, Cerebrovascular accidents, raised ICT or Space occupying lesion and patients whose guardians refused to give consent.

All patients underwent thorough medical evaluation and investigations. All the psychiatric medications were continued. After arrival to the ECT room, patients were administered oxygen by nasal prongs and cardiocscope and pulse oximeter were attached. Sphygmomanometer cuff was applied on both arms, one for BP measurement and one used as tourniquet to

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prevent succinylcholine induced paralysis so as to observe and record seizure duration. Although continuous NIBP monitoring would have been advantageous⁸ the same is unavailable in our ECT setup. Mercury sphygmomanometer was used as it is accepted as the 'Gold Standard' for clinical measurement of BP. Also it is undisputed that the mercury sphygmomanometer has the highest accuracy, with a high degree of technical agreement between devices of different producers.^{9,10}

IV access was established with 22G angiocath on the dorsum of hand.

An anaesthesiologist not involved in the study prepared and injected all the anaesthesia drugs. The induction agent was taken in a black plastic syringe and the study drug (Magnesium Sulphate 30 mg/kg diluted with 0.9% saline total volume of 10 ml) was prepared as 'trial drug.' During injection of drugs, patients hand was covered to ensure blinding. The Anaesthetist conducting the study monitored each specific parameter of the patient.

All patients received premedication with IV Glycopyrrolate 0.004 mg/kg. Anaesthesia was induced with Thiopentone Na 4 mg/kg or Propofol 1.25 mg/kg given over 10 sec as per the assigned group. After loss of Eye Lash reflex, ability to mask ventilate the patient was confirmed and the study drug MgSO₄ 30mg/Kg was injected over 30sec. The Sphygmomanometer cuff in the opposite arm was inflated and IV succinylcholine 0.5 mg/kg was injected followed by 5 mL of 0.9% saline to flush the line. The patients were manually ventilated with Oxygen enriched air, with bag and mask till fasciculations disappeared. As soon as the jaw was relaxed, mouth was opened and rubber bite block was placed between teeth to avoid injury to the teeth and tongue during the seizure, and ECT stimulus was administered.

The Psychiatrist applied bitemporal electrodes dipped in Normal Saline and a suprathreshold electrical stimulus of 70 to 100 Volts was applied for a period of 0.8 to 2 seconds. The magnitude of the energy setting for ECT stimulus was predetermined by age and weight for each patient. One more electrical stimulus at a higher energy level was given immediately after the initial stimulus (at the psychiatrist's discretion) if the seizure duration was not long enough (<20 sec). Once the twitching of the muscles passed off, the bite block was removed and patients were ventilated with oxygen enriched air with bag and mask till the return of spontaneous respiration. Visual diaphragmatic movement was used to assess the apnea time from induction of anesthesia to onset of spontaneous ventilation.

Heart rate, Systolic (SBP) and diastolic (DBP) arterial blood pressures and oxygen saturation (SpO₂) values were recorded on arrival for the ECT (baseline value), after injection of induction agent, after injection of Trial Drug and succinylcholine and then at 0, 1, 3, 5 and 10 min after the end of the ECT-induced seizure. '0' being immediately at the end of the seizure activity. Mean arterial pressure was calculated from the above readings.

Duration of seizure: The time from application of electrical stimulus to the last clonic movement.

Duration of apnea: Time from injection of succinylcholine to the onset of first spontaneous post electroconvulsive breath.

Adverse events such as bradycardia, arrhythmias, hypotension, desaturation were looked for throughout the observation period

and before discharge back to the ward.

Sample size: Sample size was calculated from a previous study.¹¹ on the basis of the anticipated difference in mean SBP between the two groups. The study revealed that the SBP increase induced by ECT was approximately 30%. Assuming Type I error of 5% and Type II error of 20% (Power 80%), a 50% reduction was considered as clinically significant with standard deviation of 25 mm. This required a sample size of 45 patients in each group. We used 50 patients in each group for a comfortable margin of error.

STATISTICAL ANALYSIS

Data was analyzed with SPSS statistical software. Data from both groups was compared between groups and within the group. Intergroup data was analyzed using t test for independent sample and intragroup data was evaluated by paired t-Test, with *P* values <0.05 considered statistically significant, *P*<0.001 highly significant and *P*>0.05 as non significant. Data is presented as mean ± SD.

RESULTS

A total of 100 patients were included in this prospective, randomized, double blind study with 50 patients in each group. The groups were comparable with regard to the demographic data, ASA grade, psychiatric diagnosis and baseline haemodynamic parameters (Table-1).

The baseline mean pulse rate (PR), pulse rate after injection of induction agent and after trial drug + succinylcholine was comparable between the groups. There was an increase in the mean pulse rate immediately after seizure (0 min) in Group T (Thiopentone Na + MgSO₄) which was highly significant (*p*<0.01) when compared with the baseline pulse rate and this increase persisted till 10 minutes. In Group P (Propofol + MgSO₄) the mean pulse was clinically and statistically comparable with baseline pulse rate at all times (*p*>0.05).

When compared between the two groups, the mean pulse rate in Group T was clinically and statistically higher than the pulse rate observed in Group P during the post ECT period; the statistical difference being significant at 0 and 1 minute (*p*<0.05) and 3, 5 and 10 minutes with *p*<0.001 (Table-1, Figure-1).

The baseline mean systolic blood pressure (SBP), SBP after injection of induction agent and trial drug + succinylcholine was comparable between the groups. In both Groups T (Thiopentone Na + MgSO₄) and Group P (Propofol + MgSO₄) there was no increase in SBP post ECT; and it was comparable with baseline SBP as well as with each other at all times (*p*>0.05) (Figure-2).

The baseline diastolic blood pressure (DBP), DBP after injection of induction agent and after trial drug + succinylcholine was comparable between the two groups. In both Groups T and Group P there was no increase in DBP and it was comparable with baseline value as well as with each other at all times during the observation period (*p*>0.05) (Graph 3).

The MAP was calculated as per formula $MAP = 2/3DBP + 1/3SBP$ in mmHg. The baseline mean arterial pressure (MAP), MAP after injection of induction agent and trial drug + succinylcholine was comparable between the two groups. In both Group T and Group P the MAP was comparable with baseline MAP as well as with each other at all times during the observation period (*p*>0.05) (Graph 4).

There was no statistical difference in the SPO2 and apnea time (Table-3) between the two groups. The seizure duration in group P was statistically significantly shorter as compared to in Group T (p<0.05) (Table-2). However this duration was clinically acceptable. None of the patient had seizure duration of < 30 seconds. There was no incidence of any adverse effect such as bradycardia, arrhythmias, hypotension, desaturation in any of the groups.

DISCUSSION

Electroconvulsive therapy (ECT) was introduced in 1934 as a treatment for Schizophrenia and is currently a widely used modality for treatment of severe psychiatric disorders. Today, an estimated 1 million people worldwide receive ECT every year.¹²

The goals of General anaesthesia for ECT are to provide the patient with lack of awareness with use of anaesthetic agents compatible with the psychotropic medications, attenuation of the haemodynamic response to ECT with minimal antagonistic effects on seizure activity, modification of the motor effects of seizure in order to prevent injury and ensure rapid recovery.¹³ Patients receive ECT repeatedly for several weeks; hence

adjustment of dosages of induction agents, muscle relaxants, and adjuvant drugs as well as communication and coordination between anaesthesiologist and psychiatrist is essential.

Seizure activity which is the therapeutic aspect of ECT is accompanied by untoward physiologic cardiovascular response due to generalized autonomic nervous system stimulation resulting in initial parasympathetic outflow followed immediately by a more prominent sympathetic response. The sequence described may result in an initial bradycardia lasting 10 to 15 seconds or even frank asystole, followed by tachycardia and hypertension lasting 5 minutes or longer.¹⁴⁻¹⁸ The cardiovascular response is associated with the release of catecholamines and/or vasopressin. Systolic blood pressure (SBP) transiently increases by 30%–40% and the heart rate (HR) by 20% or more, resulting in a two to fourfold increase in the rate–pressure product (RPP) which is an index of myocardial oxygen consumption. Older patients typically manifest a larger increase in RPP. In patients at risk, the hemodynamic response to ECT can produce myocardial ischemia, infarction and even cardiac rupture. Even in normal patients, ECT has been shown to reduce left ventricular systolic as well as diastolic function.¹⁹ A wide variety of drugs have been administered in an effort

	Group T (THIOPENTONE+MgSO4)		Group P (PROPOFOL+MgSO4)		P
	Mean	Std Dev	Mean	Std Dev	
Age (yrs)	33.54	10.418	35.46	8.29	0.310
Weight (Kgs)	49.30	8.179	51.86	6.670	0.090
Sex	M	F	M	F	0.160
	27	23	25	25	
ASA Grade	I	II	I	II	0.543
	47	3	45	5	
Diagnosis	Bipolar Disorder	Schizophrenia	Bipolar Disorder	Schizophrenia	0.367
	23	27	20	30	
Baseline pulse rate	Mean	Std Dev	Mean	Std Dev	0.988
	85.82	13.414	85.86	13.406	
Baseline systolic BP (mm of Hg)	Mean	Std Dev	Mean	Std Dev	0.954
	133.98	13.866	134.14	13.783	
BASELINE DIASTOLIC BP (mm of Hg)	Mean	Std Dev	Mean	Std Dev	0.940
	83.28	8.099	83.40	7.701	

Table-1: Comparison of demographic data and Baseline parameters

Time	Group T THIOPENTONE+MgSO4			Group P PROPOFOL+MgSO4			Inter Group P
	Mean	Std Dev	P (IntraGp)	Mean	Std Dev	P (IntraGp)	
	Arrival	85.82	13.414		85.86	13.406	
After induction	85.82	13.414	1.000	85.66	13.393	0.074	0.953
After trial drug+sch	86.18	13.374	0.132	85.82	12.639	0.999	0.890
0 Min	92.96	14.784	0.000**	86.16	12.517	0.147	0.015*
1 Min	93.18	12.964	0.000**	86.46	11.715	0.120	0.008*
3 Min	95.14	11.077	0.000**	86.62	11.370	0.165	0.000**
5 Min	95.94	13.721	0.000**	86.98	11.369	0.146	0.000**
10 Min	96.54	14.320	0.000**	87.36	11.435	0.109	0.000**

Table-2: Comparison of Mean Pulse Rate

Group	Group T		Group P		P
	Mean	Std Dev	Mean	Std Dev	
APNOEA Duration (Minutes)	4.049	0.436	3.994	0.408	0.517
SEIZURE Duration (Seconds)	35.86	7.157	32.62	1.794	0.002*

Table-3: Apnoea Time and Seizure Duration

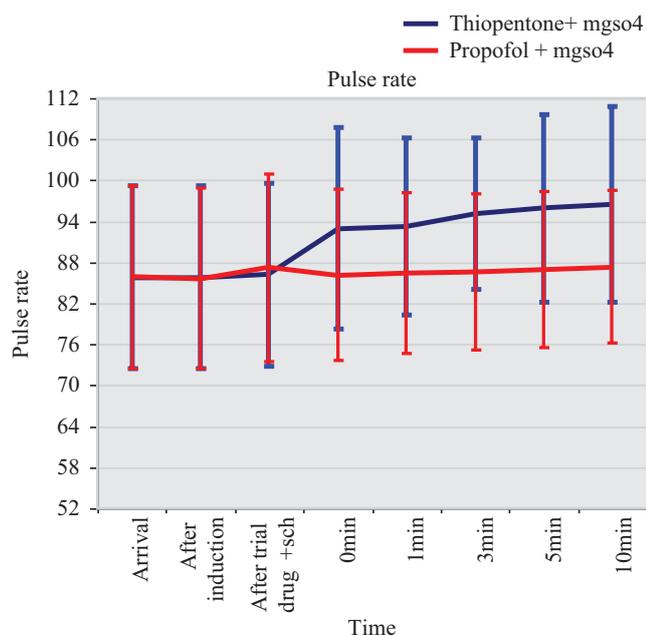


Figure-1: Mean Pulse Rate

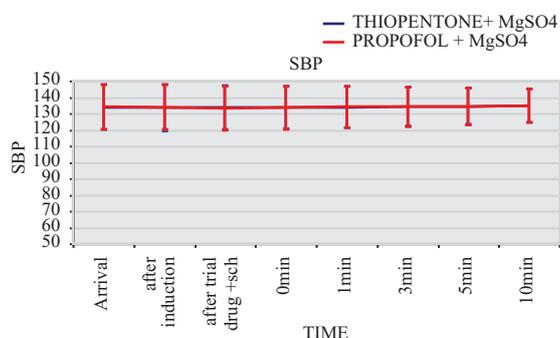


Figure-2: Mean Systolic BP

to minimize ECT induced haemodynamic changes.^{20,21} Nitroprusside, Nitroglycerine, Esmolol, Labetalol, Propranolol, Nicardipine, Diltiazem, Urapidil, Landiolol, Alfentanil, Remifentanyl, Clonidine, and Dexmedetomidine have been used with varying results. Many of these drugs are unable to completely block the acute hypertensive response to ECT without causing prolonged hypotension, some led to shortening of the seizure reducing the efficacy of the treatment,²² and some had added problem of sedation.

For over a century, MgSO₄ has been used to treat tachyarrhythmias and myocardial ischemia, for tocolysis, control of convulsions in eclampsia, haemodynamic control in Pheochromocytoma, and in the management of autonomically unstable conditions such as tetanus.²³ Recently it has been described as the emerging drug in anaesthesia practice.²⁴

MgSO₄ is involved in control of vasomotor tone and produces vasodilatation by acting directly on blood vessels. It reduces release of catecholamines, vasopressin, or both. It attenuates vasopressin stimulated vasoconstriction and normalizes sensitivity to vasopressin. In a dose of 30-40 mg/kg MgSO₄ has been shown to be effective in attenuating the pressor response to tracheal intubation,²⁵ and pneumoperitoneum.²⁶ It has immediate onset of action when given IV and the action lasts for 30 minutes.

In view of these pharmacological properties of Magnesium

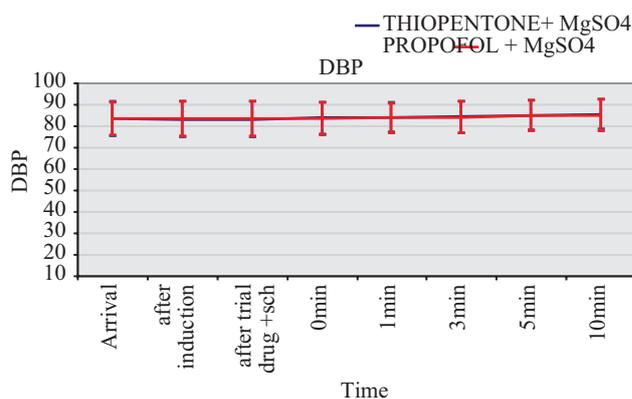


Figure-3: Mean Diastolic BP

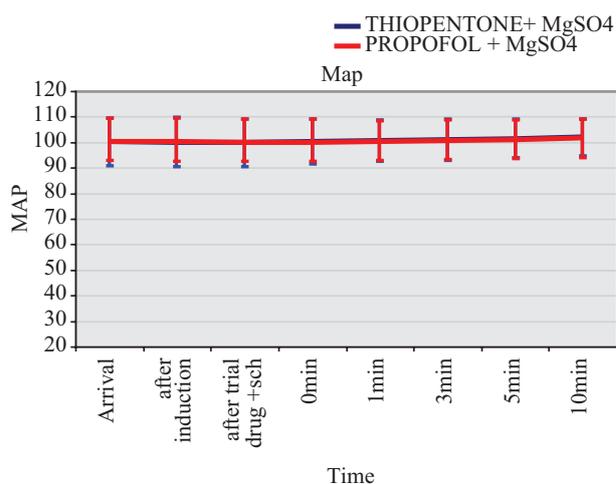


Figure-4: Mean Mean Arterial Pressure

sulphate, we decided to investigate whether MgSO₄ in a dose of 30mg/Kg, attenuates the haemodynamic stress response to ECT in this prospective, randomized, double-blind study. MgSO₄ is vagolytic in nature.²⁷ In a previous study,²⁸ MgSO₄ was found to have no action on heart rate response to ECT. In the pilot study using Thiopentone Sodium as a standard induction agent, we observed that although MgSO₄ attenuated hypertensive response to ECT, it was associated with increase in pulse rate. Thus we decided to evaluate whether the combination of MgSO₄ with Propofol which has intrinsic vagomimetic property provides better attenuation of haemodynamic response to ECT. The 2 groups were comparable with respect to demographic parameters, psychiatric diagnosis, ASA grade and baseline hemodynamic parameters.

IV glycopyrrolate was administered to all patients to avoid excessive secretions as well as to prevent bradycardia and reduced cerebral oxygenation/perfusion associated with ECT induced parasympathetic outflow in the stimulation phase of seizure. Both Thiopentone Sodium and Propofol have been used effectively for ECT.²⁹ As both have anticonvulsant properties, we selected comparable doses proven to have least effect on the duration of seizure. Propofol produces similar dose-dependent effects (slow waves with high gamma activity) on EEG activity in patients with or without a history of seizure disorders. While induction of anesthesia with higher doses of propofol (>1.5 mg/kg) in patients with well controlled seizure disorder is safe, smaller sedative doses should be administered with caution to epileptic patients. Succinylcholine was used in the dose

recommended by Royal college of Psychiatrists.²⁹

The mean pulse rate, SBP, DBP and MAP after injection of induction agent and succinylcholine + trial drug in both the groups were comparable with baseline values as well as with each other.

There was no increase in mean pulse rate in Group P (Propofol + MgSO₄) at any time during the observation period. Group P had a statistically significant attenuation of mean pulse rate when compared with Group T (Thiopentone Sodium + MgSO₄) at all times post ECT. These findings indicate that MgSO₄ has less effect on the post ECT increase in pulse rate. Propofol + MgSO₄ combination provides attenuation of ECT related tachycardia as propofol counters the vagolytic action of MgSO₄. Therefore the authors recommend this combination for ECT anaesthesia.

Patients in both Group T and Group P had a statistically significant attenuation of SBP, DBP and MAP at all times post ECT. These findings indicate that MgSO₄ is effective in attenuation of hypertensive response to ECT.

Dirk H, van Zijl et al compared Remifentanyl and MgSO₄ with placebo for attenuation of haemodynamic response to ECT. They found that there was a rise in heart rate in both MgSO₄ and placebo group at all time post ECT. They observed that MgSO₄ attenuated increases in SBP at 0, 1 and 3 min post ECT and neither MgSO₄ nor placebo attenuated the heart rate increase at 1 and 3 min. They recommended MgSO₄ for attenuation of hypertensive response in patient at risk of developing post ECT bradycardia but not in patients of ischaemic heart disease.³⁰

MgSO₄ has a potential to cause of hypotension due to its direct depressant effect on myocardial and vascular smooth muscle and reduction in release of catecholamines. However in our study no patient had hypotension.

Propofol significantly shortened the seizure duration. However the seizure duration was > 30 seconds in all patients and was in the therapeutic range. The apnoea time was comparable in all the 3 groups. There was no incidence of desaturation, arrhythmias or any other adverse effect observed in the study.

CONCLUSION

Our results show that Propofol and MgSO₄ combination is effective in attenuation of the sympathetic haemodynamic response to ECT. It attenuates increase in heart rate, systolic, diastolic blood pressure and hence the rate pressure product. Propofol reduces Seizure duration; but it remains in the therapeutic range which is primary aim of the therapy. Thiopentone Sodium and MgSO₄ combination is effective in attenuation of hypertensive response but not the heart rate response.

In elderly patients and those with ischemic heart disease, propofol + MgSO₄ combination will be advantageous. Because MgSO₄ has less effect on heart rate, Thiopentone Sodium + MgSO₄ might offer advantages in patients at risk for post-ECT bradycardia.

The limitation of our study is that we did not have a placebo control group. A pilot study of using placebo control groups as well as plenty of studies in literature have revealed that a haemodynamic response is associated with ECT and is undesirable.

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A Study on Awareness about Blood Donation and Blood Transfusion among Junior Doctors in Teaching Hospitals of Meerut

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ABSTRACT

Introduction: Junior doctors of teaching hospitals are those who directly come in contact with blood donors, recipients and their families. They are also responsible for encouraging voluntary blood donation. It is therefore, necessary to assess their own knowledge, beliefs and attitude towards blood safety and blood donation. This study is conducted to know the awareness of junior doctors in teaching hospitals about blood donation and transfusion.

Material and methods: The study was undertaken at two teaching hospitals, Subharti Medical College and Lala Lajpat Rai Memorial Medical College, Meerut in October 2015- January 2016. The study population comprised of one hundred two junior doctors of the above mentioned two institutes. A pre-designed questionnaire was used to collect data.

Results: Junior doctors were well aware about blood donation and blood transfusion. But, awareness about components was less. Most had satisfactory knowledge about blood group and sample collection.

Conclusion: Our study gives a good insight into the awareness levels of junior doctors in teaching hospitals, which is satisfactory regarding few aspects of blood banking, but, very much lacking in others. It calls for encouraging education about blood donation, safety and other aspects of blood banking among the junior doctors.

Keywords: Blood donation, Transfusion, Component, Awareness

INTRODUCTION

There is no ideal substitute of blood and hence, blood transfusion still remains a vital component of patient management. Thus, safety and availability of blood and blood products is an important issue of concern.¹

According to WHO, 'Safe Blood' is blood that does not harm to the person who receives it. 83% of global population living in developing countries have access to only 40% of blood supplied, and 60% of cases of this blood is collected from paid or replacement blood donors rather than from voluntary non-remunerated low-risk donors.²

In our country, collected blood is tested mostly for HIV, HBsAg, VDRL and Malaria. Studies among blood donors regarding presence of infection in different cities have shown high rates in Delhi having 4.5% VDRL positive, 3.2% HBsAg positive and 1.35% HIV positive, and Calcutta showing lower rates with 0.14% VDRL positive, 1.2% HBsAg positive and 0.04% HIV positive.³

Thus, it is very important to encourage voluntary blood donation, proper testing and storage of blood components and creating awareness about blood donation and safety among health care providers as well as general population.

Optimal utilization of blood helps in eliminating the use of allogenic blood and often prevents unnecessary exposure of

a patient to the risk of blood-borne endogenous infections. Appropriate and rational use of blood/blood components is required to ensure their availability to needy patients as well as to avoid unnecessary risk of transfusion mediated diseases.

Rational use of blood means providing the blood product in the right quantity, for the right patient.⁴

Junior doctors of teaching hospitals are those who directly come in contact with blood donation and recipients with their families. Some of them as teachers, are also responsible for giving the right message to their students. Therefore it is necessary to assess their own awareness, knowledge, beliefs and attitude towards blood safety, donation and transfusion.

Organizing doctors awareness and training sessions, including CME programmes should be held in various hospitals.

Aims and Objectives

To assess awareness about blood donation and transfusion among junior doctors in teaching hospitals.

MATERIAL AND METHODS

The study was undertaken at two teaching hospitals, Subharti Medical College and Lala Lajpat Rai Memorial Medical College, Meerut in October 2015- January 2016. The study population comprised of one hundred two junior doctors of the above mentioned two institutes selected randomly.

A pre-designed questionnaire was used to collect data.

The Questionnaire consisted of multiple choice questions and required approximately 15 minutes to complete.

In general, the questions concerned:

1. Donor age and haemoglobin criteria
2. Level of knowledge about blood components-PRBC, Platelets, FFP etc
3. Awareness about transfusion practices
4. General information about blood groups and sample collection

STATISTICAL ANALYSIS

Statistical analysis was done by calculating the mean and percentage of correct and incorrect answers given by the participants, thereby assessing the awareness regarding the questions asked. Data calculated was combined and assembled

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in tabulated form.

RESULTS

Table 1 shows that most junior doctors have knowledge about age limit for autologous blood donation (81.0%), but there is less knowledge about age criteria for donor (30.39%) and least about minimum haemoglobin criteria for blood donation (22.0%).

Table 2 shows that majority of participants know about storage temperature of PRBC (81.0%) and shelf life of platelets (86.73%). But, knowledge about components is limited as far as storage temperature of platelets (58.0%) and contraindication for platelet concentrate (21.88%) are concerned. Awareness about use of stored whole blood (79.00%) and indication for cryoprecipitate (78.79%) is satisfactory.

Table 3 is to assess knowledge of participants regarding blood transfusion practices which shows that maximum number of participants know about management of immediate transfusion reactions (86.27%), most frequent cause of fatal transfusion reaction (70.0%) and transfusion transmitted diseases (88.24%). But, there is limited knowledge about time for transfusion of one unit pRBC (70.00%), increase in platelet count by transfusion of one unit platelets (28.00%), transfusion trigger for PRBC / whole blood (15.79%) and best blood group for emergency transfusion (51.00%).

Table 4 indicates that the level of awareness about Bombay blood group (78.43%) and vacutainer used for sample collection for DCT (73.53%) are satisfactory.

DISCUSSION

The study reveals that though most of the junior doctors of the teaching institutes were aware about 'safe blood' and importance of blood donation, only few of them knew about all the mandatory tests and requirements of blood banking. In another study done to check awareness and perceptions regarding blood safety and blood donation among health care providers in a teaching hospital of Calcutta, only 69.7% of resident doctors, 43.3% of 'other group' of staff, 23.3% doctors, 8% of nurses and no group D staff knew about all mandatory tests for collected blood.¹

In our study, 88.24% junior doctors knew about transfusion transmitted diseases. The finding is comparable to the finding of a study among senior secondary students in Delhi in which 86% knew that AIDS can be spread by blood transfusion.⁵ In another study, in south India, 2.2% out of 14.2% illiterate and 52.9% out of 85.8% literate respondents attributed blood transfusion as a means of spread of AIDS.⁶

Regarding awareness about guidelines and pre-requisites for blood donors and blood donation, only 30.39% junior doctors had satisfactory knowledge about age criteria of donor, very few (only 22.0%) knew the minimum haemoglobin criteria for blood donation, whereas, 81.0% knew the age limit for autologous blood donation. In a similar study done among health care providers, most were aware about needle safety (70.7%), highest being the doctors (93.3%), followed by nurses (84%) and trainee doctors (81.8%). 'Other group' staff were most knowledgeable among these in most of these aspects probably because a high percentage among them were also blood donors.¹ A possible explanation for the discrepant findings between

these studies may be the different survey groups selected. A total of 102 junior doctors were selected in our study, but in the study mentioned above, the survey group included different categories of health care providers as nurses, trainee doctors and technicians and 'other group' including pharmacists, social welfare officers, shopkeepers etc.¹ In a study done in Delhi, senior secondary students were surveyed⁵ whereas a survey done in south India included general population comprising of illiterates as well as literates.⁶

Another reason for varied results may be the use of a pre-designed and semi-structured questionnaire for data collection which was not pretested. Also, no control group was included in the survey for ruling out the bias and subjective variation in the survey group.

Considering these factors, our study still gives a good insight into the awareness levels of junior doctors in teaching hospitals, which is satisfactory regarding few aspects of blood banking, but, very much lacking in others. It calls for encouraging education about blood donation, safety and other aspects of blood banking among the junior doctors.

CONCLUSIONS

The study is highly revealing in the context of global endeavour by WHO to generate awareness and motivation for voluntary blood donation. This calls for immediate continuous medical education especially involving junior doctors of teaching hospitals who constitute the largest section of health providers with huge potentiality for blood donation and motivation for the same. This will also help removing misconceptions.

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Awareness about blood transfusion among junior doctors

Name:

Department:

Date:

Designation:

Institute:

Q.1. Which among the following is not a common Transfusion Transmitted Disease

- (i) Hepatitis B (ii) Malaria (iii) Hepatitis A (iv) HIV 1 and 2

Q.2. Age criteria for donor is

- (i) 16-50 years (ii) 18-60years (iii) 18-50 years (iv) 16-60 years

Q.3. Minimum Haemoglobin criteria for donor is

- (i) 11.0gm% (ii) 11.5gm% (iii) 12.0gm% (iv) 12.5gm%

Q.4. Storage temperature of PRBC is

- (i) 1-2°C (ii) 2-6°C (iii) 6-10 °C (iv) 20-24°C

Q.5. Storage temperature of Platelets is

- (i) 1-2°C (ii) 2-6°C (iii) 6-10 °C (iv) 20-24°C

Q.6. Shelf life of platelets is

- (i) 5days (ii) 5weeks (iii) 20-24days (iv) 1month

Q.7. 1 Unit of platelet should produce increase in platelet count in an adult approximately

- (i) 5-10,000/unit (ii) 10-20,000/unit (iii) 40-60,000/unit (iv) 60-80,000/unit

Q.8. Leucocytes reduced RBC is advantageous as it reduces the risk of

- (i) Non haemolytic febrile transfusion reactions (ii) CMV transmission
(iii) HTLV-1 transmission (iv) All

Q.9. Sample used in DCT should be collected in which vacutainer

- (i) Plain (ii) EDTA (iii) Citrate (iv) Any of these

Q.10. Age limit for autologous donation is

- (i) 18-60 years (ii) No age limit (iii) 16-50 years (iv) 19-65 years

Q.11. Bombay blood group lacks

- (i) A gene (ii) B gene (iii) H gene (iv) O gene

Q.12. 1 Unit of PRBC transfusion should be completed within

- (i) 4hr (ii) 8hr (iii) 10hr (iv) 12hr

Q.13. Most appropriate indication for cryoprecipitate is

- (i) Fibrinogen deficiency (ii) Hemophilia B (iii) Hemophilia A (iv) Multifactorial deficiency

Q.14. Indication for fresh frozen plasma is

- (i) Multiple coagulation factor deficiency (ii) Disseminated Intravascular Coagulation (DIC)
(iii) Thrombotic Thrombocytopenic Purpura (TTP) (iv) All

Q.15. Platelet concentrate is contraindicated in

- (i) Thrombotic Thrombocytopenic Purpura (TTP) (ii) Idiopathic Thrombocytopenic Purpura (ITP)
(iii) Disseminated Intravascular Coagulation (DIC) (iv) All

Q.16. Management of immediate transfusion reaction includes

- (i) Stop blood transfusion immediately
(ii) Notify the blood bank and describe signs and symptoms
(iii) Blood bag, post transfusion sample and transfusion set with transfusion reaction form sent to blood bank
(iv) All

Q.17. Stored whole blood transfusion produces

- (i) Increase in haemoglobin (ii) Increase in platelet count
(iii) Increase in labile coagulation factors (iv) All

Q.18. Transfusion trigger for PRBC/Whole blood transfusion is at

- (i) 10gm/dl Hb (ii) 9gm/dl Hb (iii) 8gm/dl Hb (iv) No trigger

Q.19. What type of blood should be given in an emergency transfusion when there is no time to type the recipient's sample

- (i) O-ve whole blood (ii) O+ve whole blood (iii) O+ve packed cells (iv) O-ve packed cells

Q.20. Fatal transfusion reactions are most frequently caused by

- (i) Clerical errors (ii) Improper registration (iii) Overheating blood (iv) Mechanical trauma

A Study of Non Traumatic Coma with Respect to Etiology and Outcome

Ramesh S Hiremath¹, Pooja Shashidharan²

ABSTRACT

Introduction: Coma is among the most common and striking problems in general medicine. Because coma demands immediate attention, the physician must employ an organized approach.

Material and methods: A prospective observational cohort study was undertaken in 50 randomly selected patients of non-traumatic coma admitted to a tertiary care hospital over a period of one year. The selected patients were evaluated by detailed history, clinical examination and relevant investigations.

Results: Intracranial causes (50%) consisting of cerebrovascular accident and neuroinfection were responsible for the majority of cases followed by metabolic causes (44%) and drug/poisoning induced (6%). Mortality was highest (40%) in intracranial causes group. Drug induced coma showed the best recovery.

Conclusion: Intracranial lesions (cerebrovascular accident and neuroinfection) is the most common etiology of non traumatic coma and is associated with the worst prognosis.

Keywords: Glasgow coma scale, Cerebrovascular accident, Neuroinfection.

INTRODUCTION

Coma is a state of unarousable unconsciousness without any psychologically understandable response to external stimuli or inner need. The patient may appear to be asleep but is incapable of responding normally to external stimuli other than by showing eye opening to pain, flexion or extension of limbs to pain, and occasionally grunting or groaning in response to painful stimuli. It occurs when there is damage to the reticular activating substance in the upper midbrain or its projections, bilateral damage to large areas of the cerebral hemispheres, or suppression of reticulocerebral function.¹ Non traumatic coma is among the most challenging problems faced by the physician. Non traumatic coma is caused by a wide variety of conditions, some of which are more common than the others. Some of the causes of non-traumatic coma are cerebrovascular accidents, drug intoxication, metabolic disturbances, post seizure states, status epilepticus, meningitis, encephalitis, brain tumour, brain abscess.¹

The prospect of a patient in coma recovering is totally dependent upon the cause and duration of the coma; coma due to metabolic causes, endocrine disorders, hypothermia or drug intoxication is most often reversible if treated rapidly and appropriately. Clinical signs that are important for prognosis include the motor component of the GCS, the duration of coma (which is really a duration of lack of eye-opening) and other signs of brainstem damage.²

The cause of non-traumatic coma is not always evident at presentation. Knowledge about the various etiologies of non traumatic coma can guide the initial evaluation of the patient and hence facilitate an early etiological diagnosis and prompt treatment. Hereby we present a study with the aim and objective to examine

the etiologies of non traumatic coma in a tertiary care hospital and to study the outcome of the patients with respect to etiology. This study also aims to determine the relationship between the Glasgow coma scale score and the outcome of the patient with non traumatic coma.

MATERIAL AND METHODS

A prospective observational cohort study was undertaken in 50 randomly selected patients of non-traumatic coma admitted to B.M. Hospital, Mysore, over a period of 1 year, who were diagnosed and evaluated by detailed history and clinical examination. Institutional ethical committee clearance was obtained to conduct the study. Informed consent was obtained from relatives / attenders of the patients.

Patients above the age of 18 years presenting in a comatose state for more than 6 hours were included in the study. Patients presenting with traumatic causes of coma were excluded from the study.

All patients on admission were evaluated by detailed history, clinical examination, Glasgow Coma Scale scoring. Laboratory investigations included complete haemogram, serum electrolytes, blood glucose levels, renal function tests, liver function tests, arterial blood gas analysis. Other tests included urine examination, ECG, X-ray chest, CSF examination (in suspected cases of meningitis), CT scan brain in suspected cases of stroke and when needed.

Patients were evaluated neurologically on a daily basis, and the progress was monitored with Glasgow Coma Scale scoring. All patients were followed till the time of death in the hospital or discharge.

STATISTICAL ANALYSIS

Statistical methods applied were descriptives, frequencies and percentages, Chi square test and cross tabs. P value was identified by crosstabs (P value <0.05 is significant). Computer software used were MS Word and MS Excel.

RESULTS

50 cases of non-traumatic coma formed the study group. In these cases age-wise distribution, sex-wise distribution, and etiological distribution of coma was analyzed. The etiological factors were

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compared with the final outcome. Other independent variables were also entered into comparison model.

The age group ranged from 21 years to 71 years. In the age group between 21-40 years mortality was lower than in the age group of 41-70 years as shown in table-1. Thus in this study younger patients had a more favorable outcome when compared to older patients. In older patients added risk factors like hypertension (HTN), Type2 Diabetes Mellitus (DM), ischaemic heart disease (IHD), previous cerebrovascular accidents (CVA), and chronic renal failure (CRF) all added to the mortality. There was no significant relation between the age group and the outcome ($P=0.725$). However, patients with age more than 40 years were more likely to have a poor outcome as compared to those in the younger age group.

Out of 50 patients 33 were males and 17 were females, giving male to female ratio of 1.94:1. Among the 19 patients who died 12 were males (63.2%) and 7 were females (36.8%). The difference in mortality rates among males and females was not statistically significant ($P=0.740$).

Table-2 shows the association of various comorbid conditions with the outcome in patients with non-traumatic coma. The most statistically significant disease was hypertension ($P=0.029$). Hypertension was present more commonly in patients with cerebrovascular disease and also was more commonly associated with mortality. The most common diseases associated with patients of coma were hypertension (34%) and diabetes (40%), which are important risk factors for the etiology of non-traumatic coma.

The table-3 shows the relation of Glasgow Coma Scale scores at the time of admission to the outcome. The scoring has been divided in two groups; 3-5 and 6-8. The group of patients who

had GCS score between 3 to 5 at the time of admission had the maximum mortality, as compared to the group of patients with GCS score between 6 to 8. Thus there was an inverse relation of mortality to GCS score, with 94.7% mortality in patients with GCS 3-5. $P<0.001$ as shown in figure-1. There was good recovery in patients presenting with GCS score 6-8.

Table-4 shows the various etiologies of non-traumatic coma. Out of 50 cases of coma, 25 had intracranial causes like cerebrovascular accident and neuroinfections. 22 patients had metabolic causes, the most common of which were uraemic and hepatic encephalopathy. And 3 had presented with coma due to drug overdose or poisoning. Table-5 shows the broad etiological categorization of coma and its relation to the Glasgow Coma score. Amongst intracranial causes, 13 presented with a low GCS score (between 3 to 5). The etiological categorization of coma is not statistically associated with the GCS scoring with $P>0.05$. Graphical representation of the association of etiology with GCS Score is shown in figure-2.

Table-6 shows, the association between the etiology and outcome of non-traumatic coma. There was higher mortality in patients with coma due to intracranial causes (40%) when compared to metabolic (36.4%) and drug induced coma (33.3%) as shown in figure-3. And amongst the intracranial causes, cerebrovascular accidents were associated with higher mortality (50%) than neuroinfections (22.2%). Drug induced coma showed the best recovery.

DISCUSSION

Multicenter large prospective studies are being reported from developed countries to define the prognosis in coma. Studies

Age in years	Total (n=50)	Deaths (n=19)	Survival (n=31)
21-30	7 (14.0%)	2 (10.5%)	5 (16.1%)
31-40	8 (16.0%)	2 (10.5%)	6 (19.4%)
41-50	7 (14.0%)	4 (21.1%)	3 (9.7%)
51-60	13 (26.0%)	4 (21.1%)	9 (29.0%)
61-70	10 (20.0%)	5 (26.3%)	5 (16.1%)
>70	5 (10.0%)	2 (10.5%)	3 (9.7%)
Total	50 (100%)	19 (100%)	31 (100%)

Contingency Coefficient(cc)=0.232; $P=0.725$

Age is not associated with the outcome ($P>0.05$)

Table-1: Age distribution with outcome

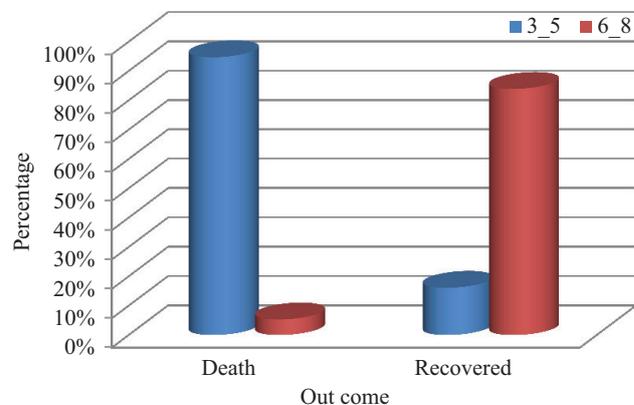


Figure-1: GCS Score and outcome

Past history (n=50)	Total	Deaths	Survival	CC-Contingency Coefficient	P value
Diabetes	20 (40.0%)	8 (42.1%)	12 (38.7%)	0.034	$P=0.812$
Hypertension	17 (34.0%)	10 (52.6%)	7 (22.6%)	0.294	$P=0.029$
Liver disease	5 (10.0%)	2 (10.5%)	3 (9.7%)	0.014	$P=0.923$
Pulmonary TB	3 (6.0%)	1 (5.3%)	2 (6.5%)	0.024	$P=0.864$
Chronic renal failure	2 (4.0%)	2 (10.5%)	-	0.252	$P=0.065$
COPD	2 (4.0%)	-	2 (6.5%)	0.158	$P=0.258$
CVA	1 (2.0%)	-	1 (3.2%)	0.111	$P=0.429$
Epilepsy	1 (2.0%)	-	1 (3.2%)	0.111	$P=0.429$
RHD	1 (2.0%)	-	1 (3.2%)	0.111	$P=0.429$
Recently delivered	1 (2.0%)	1 (5.3%)	-	0.180	$P=0.197$

COPD: Chronic obstructive pulmonary disease; CVA: Cerebrovascular accident RHD:Rheumatic heart disease

Table-2: Other disease/conditions associated with outcome

GCS score	Total (n=50)	Deaths (n=19)	Survival (n=31)
3-5	23 46.0%	18 94.7%	5 16.1%
6-8	27 54.0%	1 5.3%	26 83.9%

Contingency Coefficient= 0.608; P<0.001

Table-3: GCS Score and outcome

Etiology	Number of cases
Intracranial (IC)	25 (50%)
1. Vascular(V)	16(32%)
2. Infections(IF)	9(18%)
Metabolic (M)	22(44%)
Drug overdose/poisoning(D/P)	3(6%)

Table-4: Etiologies of non-traumatic coma

Etiology	3-5 GCS score	6-8GCS score	Total
Intracranial (IC)	10	6	16
Cerebrovascular(V)	43.5%	22.2%	32.0%
Infectious (IF)	3	6	9
	13%	22.2%	18.0%
Metabolic(M)	9	13	22
	39.1%	48.1%	44.0%
Drug overdose/poisoning(D/P)	1	2	3
	4.3%	7.4%	6.0%
Total	23	27	50
	100%	100%	100%

Contingency Coefficient= 0.229 P=0.430

Table-5: Association of etiology with GCS Score

Etiology	Deaths(D)	Survival (Good recovery + Recovery with disability)	Total
Intracranial (IC)	10	15	25
1. Vascular(V)	8	8	16
2. Infections(IF)	2	7	9
	22.2%	77.8%	
Metabolic (M)	8	14	22
	36.4%	63.6%	
Drug overdose/poisoning(D/P)	1	2	3
	33.3%	66.7%	
Total	19	31	50

Contingency Coefficient= 0.195 P=0.576

Table-6: Association of etiology with outcome

are being conducted to determine the therapeutic interventions needed to improve the prognosis of coma. The overall prognosis of coma in any part of the world is usually poor as confirmed by several studies.

This study is a prospective study of 50 cases of coma of non traumatic etiology. Limitations of the study are a small sample size of only 50 patients as well as lack of follow up of patients after discharge.

Out of 50 cases 33 were males and 17 were females. The difference in mortality rates among males and females was not statistically significant (P>0.05). Analysis of age group revealed that majority of the cases appeared in the third to fifth decade.

Study	Etiology of non traumatic coma(%)		
	Intracranial	Metabolic	Drug/Poison
Thacker et al	57.5	26.0	5.0
Sharma et al	84.0	16.0	0
Dhamija et al	68.0	26.7	4.0
Sacco et al	35.5	21.9	6.5
Esquevin et al	59.0	31.0	0.0
Greer et al	49.0	2.0	0.0
Obiako et al	46.0	35.0	1.0
Owolabi et al	40.0	29.0	0.0
Plum and Posner	45.2	21.4	29.8
Present Study	50.0	44.0	6.0

Table-7: Comparison between present study and other studies with regard to etiology of non traumatic coma

Studies	GCS score at admission	Deaths %	Survival%
1. Sacco et al.	3-5	85.2	14.8
2. Thacker et al.	<4	75.0	25.0
3. Dhamija et al.	3-6	84.0	16
4. Owolabi et al.	3-5	70.7	29.3

Table-8: Studies showing outcome of coma in relation to GCS scoring

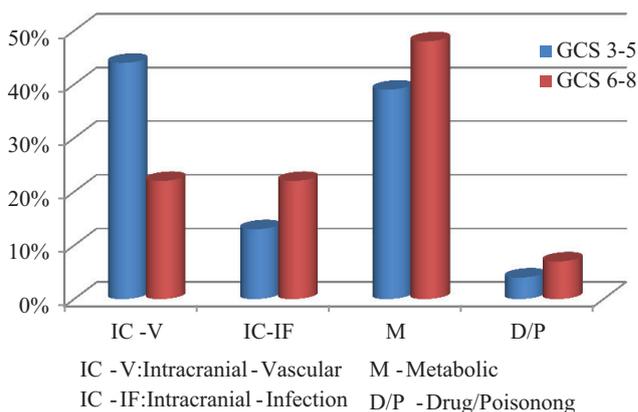


Figure-2: Association of etiology with GCS Score

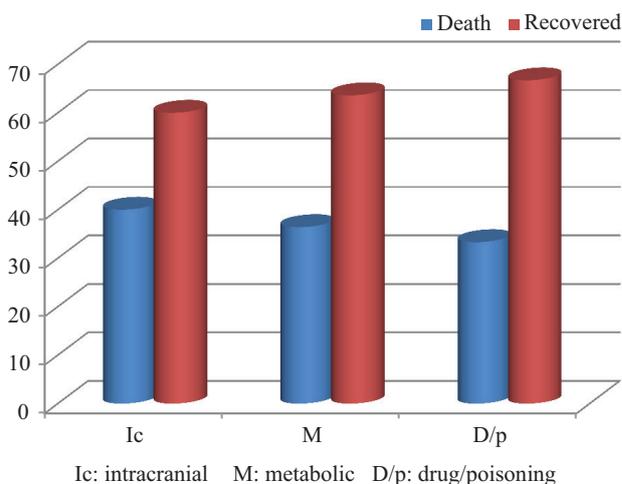


Figure-3: Association of etiology with outcome

There was no statistically significant correlation between age of the patient and mortality. However, patients with age more than 40 years were more likely to have a poor outcome compared to the other groups. According to some studies, in coma after head

injury, age was an important determinant of outcome, but in non traumatic coma, age had no effect on outcome.³

While analyzing the etiology of non traumatic coma, present study indicated that the intracranial causes constituting 50% of cases were the commonest cause of medical coma followed by metabolic causes (44%). Drug and poisoning induced coma comprised 3 cases (6%). The results of the present study is comparable with that of other studies on coma,^{4,12} in which intracranial causes formed the major etiology of non traumatic coma, as shown in Table-7.

Some western studies^{13,14} showed hypoxic ischemic coma as the commonest cause. In the present study intracranial causes included cerebrovascular accidents (32.0%), neuroinfections (18.0%). All the 16 cases of cerebrovascular accidents were diagnosed by CT scan brain. Out of 16 cases, there were 4 cases of intracerebral hemorrhage, 2 cases of subarachnoid hemorrhage, 10 cases of cerebral infarctions. Out of 10 cases of cerebral infarction 1 was a case of rheumatic heart disease and had mitral stenosis with pulmonary hypertension.

Among the risk factors in CVA group diabetes was present in 8 cases and hypertension in 12 cases, and hypertension was more associated with intracerebral hemorrhage. There were two cases of subarachnoid hemorrhage and one was associated with hypertension. Among cerebral infarcts and hemorrhages, hemorrhages carried the worse prognosis. There were 9 cases of neuro-infection leading to coma out of which 2 cases were diagnosed to have tubercular meningitis, of which one was infected with HIV virus. The diagnosis was confirmed by CSF analysis. Thus HIV co-infection is a major risk factor for neuroinfections particularly tubercular meningitis.

There were 22 cases of metabolic cause of coma out of which 5 were in hepatic coma. 4 of these patients of hepatic coma were alcoholics and 3 of these presented with upper GI bleeding. Liver function tests were done in all the cases and 2 underwent upper GI endoscopy after recovery for diagnosis and management of oesophageal varices. Most of the patients presenting with hepatic coma had upper gastro-intestinal bleeding, suggesting it to be a precipitating factor of hepatic coma, as described by Sherlock S.¹⁶

There were 5 cases of uremic encephalopathy out of which 2 had chronic kidney disease due to diabetic nephropathy. Other metabolic causes of coma included diabetic ketoacidosis encountered in 3 patients, hyponatremia (2 cases), hypoglycemic coma (3 cases) and hypoxic encephalopathy (4 patients).

3 cases of coma due to toxin/drug overdose were encountered in this study, one due to phenobarbitone overdose, one organophosphorous compound poisoning and the other was alcohol intoxication. Intracranial causes (cerebrovascular accident and neuroinfection) is the leading etiology of non-traumatic coma in our study. Among the intracranial causes of non-traumatic coma, cerebrovascular accident was found to be the most common in our study and also in various other studies.⁴⁻⁹

GCS Score and outcome

One useful guide to initial severity of coma is the depth and duration of coma, and it is to record this that the Glasgow Coma Scale evolved. In this study the severity of coma at the time of presentation has been assessed by Glasgow coma scale. The GCS scoring was done till the recovery of coma or till the death or discharge of the patient from the hospital. And the outcome

was categorized as death and survival (good recovery and recovery with deficits).

The GCS score at the time of presentation was between 3 and 8 in this study. Based on GCS score patients were categorized into two groups-GCS score 3-5 and 6-8, as done in other studies.⁷ There were total 23 cases with scores between 3-5 and 27 cases with scores between 6-8. Most of the cases with a score of 3 had intracerebral hemorrhage and had 100% mortality. Among those patients with GCS score 4-5, 5 survived. There was only one mortality in the group with scores GCS 6-8. The group of patients who had GCS score between 3-5 at the time of admission had the maximum mortality, when compared to the group of with GCS score between 6-8. Thus there was an inverse relation of mortality to GCS score, with 94.7% mortality in patients with GCS 3-5. There was good recovery of coma in patients presenting with GCS score 6-8. One patient of coma caused by hypoxic encephalopathy due to hanging who had a GCS score of 5 made good recovery and the other patients who survived with GCS score of 5 had CVA, viral encephalitis, uraemia due to ARF, diabetic ketosis.

In one study, the 2 week outcome for 88 patients with initial GCS score of 3 to 5 was 85.2% dead or in persistent coma. For those with GCS of 6 to 8, 46.9% were dead or in persistent coma.⁷

Table-8 shows other studies with their results of outcome of coma in relation to GCS scoring, which is similar to our study with 95% mortality in the group with GCS score 3-5.^{4,6,7,11}

Thus GCS Scoring system used to assess the severity of coma and to predict the outcome of coma in this study is a valuable tool, with sensitivity of 95% and a positive predictive value of 78%. For the assessment of mortality, the GCS score provides the best indicator for patients with non-traumatic coma.⁷ An increasing probability of poor outcome with decreasing GCS has been found.¹¹

Association of outcome with etiology

Among the 25 intracranial causes, there were 16 cases of cerebrovascular accidents and 9 were due to neuroinfections like tubercular meningitis, bacterial meningitis and viral meningoencephalitis. There was higher mortality (40%) in patients with coma due to intracranial causes as compared to metabolic (36.4%) and drug induced (33.3%) coma. And amongst the intracranial causes, cerebrovascular accidents were associated with more number of deaths (50%) than neuroinfections (22.2%). Similar results were obtained in other studies, in which cerebrovascular accident was associated with highest mortality.^{8,11,13}

Drug induced coma showed the best recovery of 66.7% as compared to intracranial causes (60% recovery) and metabolic causes (63.6% recovery). So drug induced coma can be taken as independent predictor of outcome.^{7,13,17,18} Frosberg et al.¹⁹ and Weiss et al.¹⁵ also demonstrated lowest mortality in drug induced coma.

In one series, patients with subarachnoid hemorrhage, brain infarct, and brain hemorrhage had the worst prognosis, followed by those with hypoxic or ischemic injuries; coma due to hepatic encephalopathy or metabolic causes had the best prognosis.²⁰

CONCLUSION

This study concludes that intracranial causes (cerebrovascular

accident and neuroinfection) is the most common etiology of non-traumatic coma presenting to a tertiary care centre followed by metabolic causes and drug/toxin induced. Mortality was found to be highest in intracranial causes group, whereas drug induced coma was associated with the best prognosis. This study also concludes that a low GCS score is associated with a poor outcome and hence GCS score remains the most readily available tool for assessment of non-traumatic coma, to identify those who are likely to die and those having the greatest potential for recovery. This study also concludes that empirically based estimates of prognosis in the neurologically severely ill provides great reassurance to those involved in a decision making process, including patients, families and physicians.

Knowledge of potentially favourable outcome greatly improves the morale and associated level of care on a cost effective basis.

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A Study on the Prevalence of Myopia Among High School Students in Urban Field Practice Area of Osmania Medical College, Hyderabad, Telangana

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ABSTRACT

Introduction: Myopia, or nearsightedness, is a form of visual impairment in which distant objects appear due to excessive axial eye growth that is mismatched to the eye's refractive power. Myopia is a common vision condition affecting nearly 30% of population. It occurs more frequently among school children aged between 8 and 12 years. Uncorrected refractive errors are responsible for about 19.7% of blindness. Objectives: This study is aimed at finding the prevalence of myopia among the high school students aged 12-16 years of a school in the urban area of Telangana and the influence of environmental factors, indoor activities like reading, computer games and outdoor activities.

Material and Methods: A cross-sectional study of government schools in the urban field practice area of Osmania Medical College was made.

Results: The study population comprised of 600 students out of which 54.5% were boys and 45.5% were girls. 140 (23.3%) children were confirmed to have refractive error. It was found that there was a female preponderance among students.

Conclusion: More incidence in girls. More hours of outdoor activity prevented myopia.

Keywords: Myopia, outdoor activity, computer.

children in India and South Africa show lower rates of myopia (4.8-10% and 4%, respectively).¹ The prevalence of myopia has been reported as high as 70-90% in some Asian countries. In East Asia the prevalence of myopia has been reported to be very high particularly in Japan, South Korea, Singapore, Taiwan, Hong Kong, and China though in India rates are much lower. Myopia is a common vision condition affecting nearly 30% of population. It occurs more frequently among school children aged between 8 and 12 years. Uncorrected refractive errors are responsible for about 19.7% of blindness. About 13% of Indian population is in the age group of 7-15 years. And about 20% of children develop refractive error by the age of 16 years and this has been reported from South Asia and India. In Telangana, not many studies on prevalence of myopia have been done. Thus this study was undertaken to find out the prevalence of myopia in high school children and its causes. This study was aimed at finding the prevalence of myopia among the high school students aged 12-16 years of a school in the urban area of Telangana and the influence of environmental factors, indoor activities like reading, computer games and outdoor activities. Also to know the influence of genetic factors and unhealthy reading habits like reading in supine position, reading in low illumination at a near distance and playing mobile games for long duration helps in development of myopia.

INTRODUCTION

Myopia, or nearsightedness, is a form of visual impairment in which distant objects appear due to excessive axial eye growth that is mismatched to the eye's refractive power. Rising myopia prevalence rates are due to advanced technology and increased indoor activity, decreased outdoor activity and decreased illumination. The duration and degree of another myopia risk factor, near work, are typically estimated retrospectively through questionnaires that assess reading and computer use. But strictly speaking there is no comprehensive method of measuring working or fixation distance during natural tasks. Close reading at a distance <30 cm and continuous reading for >30 minutes and in decreased illumination increases the progression of myopia. The risk of development of myopia further increases with the habit of reading in supine position. Because the eye continues to grow during childhood, it typically progresses until about age 20. However, myopia may also develop in adults in conditions of visual stress and diabetes.

Myopia rates are increasing worldwide, particularly in East Asian countries. In data reviewed by Morgan and Rose (2005), higher prevalence rates are seen in urban areas. For example, the prevalence of myopia in Japan grew from 39% in 1984 to 59% in 1996. Increases in Taiwan (36.7% in 1983 to 60.7% in 2000) and Hong Kong (83% in 2001, from 53% in 1991) have also been reported. These data show myopia in 12 and 13-year-old children. By contrast, similar studies in likewise aged

MATERIAL AND METHODS

Study Design: A cross-sectional study of government schools in the urban field practice area of Osmania Medical College was made. There were 10 schools. Permission was taken from the school authorities for the study. An informed consent sheet explaining the study aims and objectives, the detailed procedure that would be carried out along with a form to sign for providing the informed consent for given to the students. The forms were in English and the local vernacular language which is Telugu. This included permission to take vision, examine the eye, ask questionnaire about demographic details. All examinations were carried out in the presence of an appointed representative of the school principal. Ethical clearance was taken from the

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Institutional Ethical Committee prior to the study.

Inclusion criteria: All students present on the day of data collection, were equal to or more than 12 years, and who gave informed consent were included in the study.

Exclusion criteria: Students less than 12 years and who were absent on the day of data collection were excluded from the study.

Sampling: $4pq/lx1= 4x15x85/3x3 = 567$.

The sample size was rounded off to 600. The distant vision of a child was tested utilizing Snellen’s chart. The visual acuity was tested with the chart at 6 meters. If uncorrected vision was <6/12 in either eye, the child was declared to have defective vision. Students were interviewed by using self-administered questionnaire. Students were placed 6 m from Snellen’s chart and asked to read the chart. Each eye was tested separately. From the findings of this, students were grouped as myopic and nonmyopic. Students who were not having 6/6 vision for at least one eye were considered as myopic. The questionnaire was filled by asking the details from the child and was aimed to determine the genetic and environmental factors affecting the development of myopia in these children. The details regarding the time spent on reading and outdoor activities was asked individually for every day of the week. The distance from the television screen while watching television was also asked. The illumination of the room and their posture during the reading time was asked. considered statistically significant. Anthropometric measurements were done for all the children. Weight and height of all children was taken. All those children unable to read the 6/9.5 letters or those previously wearing spectacles were referred to an ophthalmologist for detailed examination. Refraction was done in 2 stages, first under cycloplegia using eye drops 2% homatropine which was instilled in the inferior conjunctival cul-de-sac twice at an interval of ten minutes and correlated accordingly. All children who were unable to read even after refraction were prescribed spectacles.

STATISTICAL ANALYSIS

The data was entered in MS Excel 2007 and analyzed in Epi Info Version 7. Analysis of categorical variables was done using Chi-square test. Criteria of significance used in the study were $P < 0.05$.

RESULTS

The study population comprised of 600 students out of which 54.5% were boys and 45.5% were girls. 64.5% of students were 12-14 years and the rest were above 14 years. All the children were screened for defective vision with the help of Snellen’s chart and 160(26.6%) children had difficulty in reading the chart from a stance of 6 m. After the ophthalmologist examination, 140(23.3%) children were confirmed to have refractive error. It was found that there was a female preponderance among students. Girls had a higher percentage (14%) than boys.

The family history was also taken into consideration and p value (0.0504) was found to be insignificant. Nevertheless in some studies, family study is considered significant. The distance of the television from the person was found to have an effect on the development of myopia. It was found that due to crowded living

	Myopic	Non myopic	Total
TV Distance <30 cm	94	358	452
TV Distance >30 cm	46	102	148
Total	140	460	600

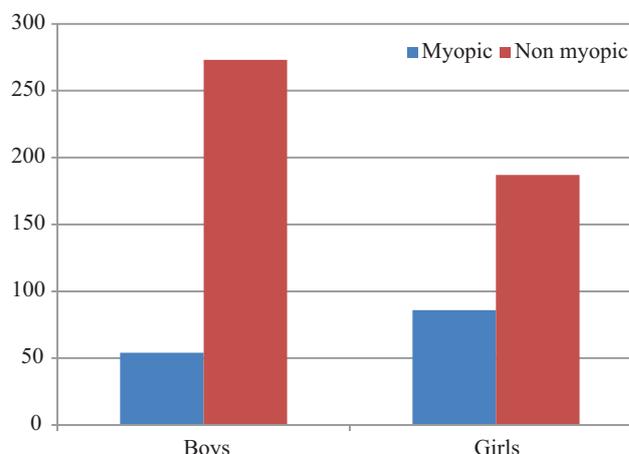
(P value-0.0102 significant.)

Table-1: Table showing the effect of the distance of tv screens from the eye with relation to myopia.

	Myopic	Non myopic	Total
>6 hrs/week playing outdoors	30	300	330
<6 hrs/week playing outdoors	90	180	270
TOTAL	120	480	600

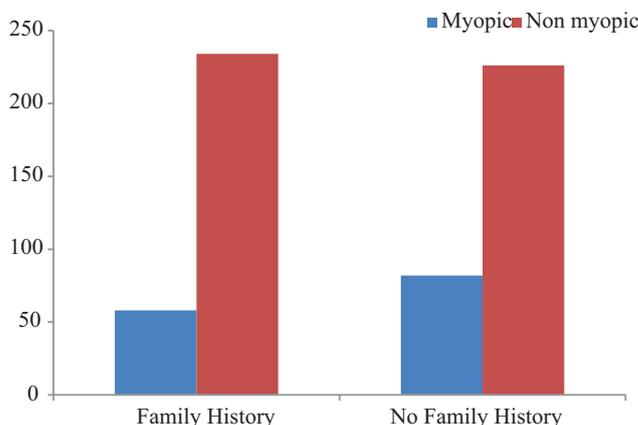
P value (<.0001) significant.

Table-2 Table showing number of hours of play outside per week with myopia development.



P value(0.0001) significant

Figure-1: A graph showing the incidence of myopia in boys and girls.



P value (0.0504)

Figure-2: A Graph showing the impact of family history on myopia.

conditions, the distance of the television could not be more. <30 cm distance from the television was found to increase myopia (p value 0.0102). It was significant. Other factors such as poor illumination and less rest to eyes in between television watching also contributed.

It was found that playing outdoors or at least staying outdoors helped to decrease the incidence of myopia. >6 hours of outdoor life was helpful in preventing myopia.<6 hours caused an increase in myopia. p value(< 0.0001) was significant.

DISCUSSION

In India, as in other developing countries, the school health services provided are hardly more than a token service because of shortage of resources and insufficient facilities. This study was done to find out the prevalence of myopia among high school students. The prevalence of myopia was found to be 23.3%. It was found in a similar study by V.Krishna Kumari et al that the prevalence was 25.8%.¹ In a study by Rohit Saxena et al the prevalence was 24.7%.² The mean age of children affected was 13.4 years. In this study there was preponderance among female students(55.6%). This was similar to other studies.³ A large percentage of children with mild refractive errors are apparently not wearing spectacles, and this may lead to increasing myopic power as time progresses, the school eye screening programme should be strengthened and good improved coverage should be encouraged. The government should provide subsidized spectacles. As stated above, girls have higher percentage of myopia (55.6%) as girls spent greater number of hours in reading and writing at home compared to boys They spend most of their time indoors. It was observed in my study that that 16% of the students who spent more time indoors had myopia compared to the 3.5% of the myopics who spent more time outdoors. This is significant. This is similar to study by Rohit Saxena et al.² Therefore girls constitute a high risk group and special efforts should be made to examine girls, counsel them and encourage them to play outdoors.⁴ The distance from tv screens also contributed towards development of myopia. This is similar to the study by K.Rajendran et al.³ In my study this factor was significant.

We found that myopia was more prevalent in children with positive family history of myopia. We can say that myopia in school children in India is an important health issue associated with many lifestyle related modifiable risk factors. An increase in outdoor activity may help to decrease myopia incidence according to studies by Amanda.⁵ Similar results were found by Morgan et al⁶ and Pan CW.⁷ Some students get headache from spending excessive time in front of TV or computer. To avoid some of these problems, it is advisable not to watch TV in a dark room, to sit a little further from the TV, to angle the computer screen straight ahead. Playing mobile games for long time induces great stress on the eye as mobile screen is very small. Many of the parents are not aware of these side effects that mobile phones can make, so let their children to play with these for a longer period of time. Unhealthy reading habits and low illumination for long time have an influence in the development of myopia. This was proved by our study. Most of the children with uncorrected refractive errors are asymptomatic and hence community screening helps in early detection of refractive errors and their further progression.⁸

CONCLUSION

The study on prevalence of myopia among adolescent school students was done among 600 students. Out of 160 students detected by the investigator, 140 students were confirmed by the ophthalmologist. There was more incidence of myopia in females. But family history was found insignificant. Risk of myopia is increased particularly in those children who have a reading habit, increased indoor activities and family history. More hours of outdoor life and increased distance from TV

screens prevented myopia. Myopia is more common in children who are constantly engaged in indoor activities like watching TV, computer, mobile and videogames. Use of antiglare screens may prevent development of myopia. Most of the children with uncorrected refractive errors are asymptomatic and hence screening helps in early detection of refractive errors and their further progression.

RECOMMENDATIONS

School health services should be improved. Spectacles should be provided at subsidized rates and myopia should be detected at an early age. Outdoor activities should be encouraged and television watching and video games should be curbed at primary school level itself.

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A Study on Prevalence of Skin Infections among School Children in Hyderabad, Telangana state

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ABSTRACT

Introduction: Skin disorders are the most frequent diseases among the school children in both developing and industrialized countries. Objectives: a) To study the prevalence of skin infection among the schoolchildren(b) To study the factors affecting skin infections among school children

Material and Methods: A community based cross-sectional study was done amongst the school children in Hyderabad city in Telangana state from November 2015 to December 2015 with the help of a predesigned and pretested proforma. Statistical analysis used: Data entry was done in Microsoft Excel and analysis by SPSS version 17 and association by using Chi-square test.

Results: Out of all skin Infections, Scabies was the major skin infection with the prevalence of 16.9% among the students, followed by pediculosis 10.7%. Prevalence of Acne vulgaris was found to be 10.2% and the prevalence of seborrhea infection among the children was 9.8%. The association between personal hygiene and skin infection is highly significant

Conclusion: In this study, prevalence of skin infection found to be associated with Poor personal hygiene practices. Hence, health education among the children as well as their parents and proper awareness regarding various skin-related health problems and to improve the personal hygiene of the children is necessary.

Key words: Personal hygiene, School children, Skin infection

INTRODUCTION

School life is the foundation for the future and have a major effect on host of issues including health. Providing easy access to hygiene, nutrition and health education and services to school children is a simple and cost effective tool that can go a long way in the prevention and control of communicable and non-communicable diseases.¹

The skin has major importance in our perception of body image so that the psychological disturbances induced by skin problems may be out of proportion to their medical significance. Very often, skin diseases offer diagnostic clues to major systemic disorders. Many skin diseases ex: Acne vulgaris, Psoriasis, Pityriasis alba, etc can be quickly diagnosed by their clinical features and need little or no further investigations.

In the process of active learning health education is an essential part. It includes personal hygiene, home, and environmental sanitation and nutritional hygiene. Personal hygiene education is one of the important aspects. If proper measures are not taken for keeping the body clean, the body is liable to various skin infections and it may hamper the physical well-being of the individual. Due to ignorance or lack of proper education, proper hygiene methods may not be practiced.²

Management of infinite variety of skin disorders range from simple reassurance to explanation through the gamut of tropical and systemic remedies. Harmful environmental factors may be associated with skin diseases and a public health approach is

particularly important

Keeping this in view, this study was done with the aim to find out the prevalence of skin infections as well as to assess the personal hygiene practices amongst the school children in Hyderabad, Telangana state with the objective to study the prevalence of skin infection among the schoolchildren and to study the factors affecting skin infections among school children.

MATERIAL AND METHODS

The study was conducted among the school children during the period November 2015 to December 2015 Hyderabad city, Telangana state. This study was a community-based cross-sectional study.

Schools are the primary sampling units in this study. The lists of primary schools are collected from the block office, and 10 schools are selected randomly for the study. Sample size was calculated by taking the prevalence rate as 30% and precision as 12%. 60 students were selected from each school by simple random sampling technique.

Inclusion Criteria: All the students present on the day of check-up and willing to participate in the study.

Exclusion criteria: Students not willing to participate in the study.

After obtaining relevant socio-demographic profile, students were clinically examined for the presence of skin disorders and details were noted down in pre-tested structured questionnaires individually. Informed consent was taken from the school authorities. Ethical clearance was taken from the Institutional Ethical Committee prior to the study.

STATISTICAL ANALYSIS

Analysis of data was done using SPSS package 17. Analysis of categorical variables was done using Chi-square test. Criteria of significance used in the study were $P < 0.05$.

RESULTS

Out of 605 school children, 29.54% have suffered from various skin disorders. Out of all skin Infections, majority was found to be Scabies with the prevalence of 16.9% among the students, followed by Pediculosis 10.7%. Prevalence of Acne vulgaris was found to be 10.2% and the prevalence of seborrhea infection

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among the children was 9.8% (table-1).

There exists an association between Mothers educational status and skin infection but it was not statistically significant (figure-1, table-2).

There was significant association between Personal hygiene of students with the prevalence of skin diseases (table-3).

DISCUSSION

The present study revealed that Scabies was the most common skin disorder accounting for 16.9%. However the

Skin Infection	Number	Percentage
Scabies	102	16.9
Pediculosis	65	10.7
Seborrhoea	59	9.8
Acne vulgaris	62	10.2
Seborrhoea dermatitis	48	7.9
Taenia	30	5.0
Vitamin deficiency	23	3.8
Impetigo	23	3.8
Pytriasis alba	16	2.6
Worm infestation	1	0.2

Table-1: Distribution of children according to Skin infection

Mothers education	Skin infection		Total
	Yes	No	
Literate	61	140	201
Illiterate	117	287	404
Total	178	427	605

P value=0.724 Chisquare value=0.125

Table-2: Association of Mothers educational status with prevalence of skin infection.

Personal hygiene	Skin infection		Total
	Yes	No	
Yes	107	332	439
No	71	95	166
Total	178	427	605

P=0.000 Chisquare value=20.083

Table-3: Association of Personal hygiene with prevalence of skin infection

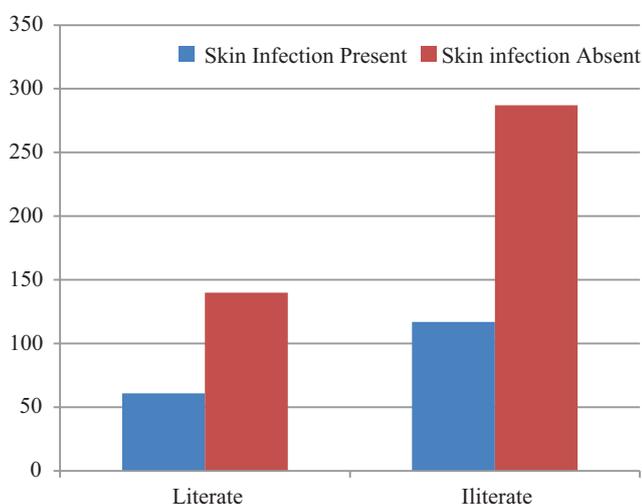


Figure-1: Association of Mothers educational status with prevalence of skin infection

study conducted in Turkey³ revealed Acne to be the most common disorder (12.4%). This could be because they took hospital based patient registry records for data collection and adolescents constituted the largest group in this study. A study in Varanasi revealed Pediculosis capitis to be the most common disorder(35%)followed by Pityriasis Alba(12%).

A study conducted in Wardha amongst tribal school children by Dongre et al.⁴ found that prevalence of head lice (42.8%), scabies (36.6%), and multiple boils (8.9%) amongst the school children. The study findings were dissimilar with the present study.

In a school survey in Varanasi city by Valia et al.⁵ 54% children had one or more skin diseases. The commonest being pediculosis capitis (35%), pityriasis alba (12%) acne vulgaris (8%).

In a study conducted among primary school children in Eastern Nepal by Shakya et al⁶, the prevalence of skin disease was 20%. Commonest of skin diseases were pediculosis (21%) followed by tinea (19.5%), scabies (14%), impetigo (11%) and eczema (10.5%).

In one study conducted in Nagpur by Charuhas et al⁷, 236 (32.1%) school children were found to suffer with various skin disorders. 155 (21.1%) had pyoderma while scabies and pediculosis capitis was observed in 41 (5.6%) and 26 (3.5%) respectively.

In another study among primary school children in Baghdad by Khalifa et al⁸ the overall prevalence of skin disorder was 40.9%. There was significant association between education status of parents with the prevalence of skin diseases (P = 0.04). But in the present study, there exists no significant association between educational status of parents with the prevalence of skin diseases.

CONCLUSION

Health education among the school children regarding personal hygiene should be given. Regarding various skin diseases among the school children, proper education and necessary support should be given by the class teachers for maintaining health status and personal hygiene of the school children.

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A Cross-Sectional Study on Effect of Initiation of Breastfeeding Within One Hour of Birth on Early Onset Neonatal Sepsis

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ABSTRACT

Introduction: Sepsis is the commonest cause of neonatal mortality; it is responsible for about 30-50% of the total neonatal deaths in developing countries. WHO recommends initiation of breastfeeding within one hour of birth. Neonatal sepsis is one of the most important morbidities seen at the community and facility levels. Aim of the study was to determine the association of initiation of breastfeeding within 1 hour of birth and early onset neonatal sepsis and to study breastfeeding initiation timing and other socio-demographic details of the study subjects.

Material and methods: A hospital based non-interventional cross sectional study conducted at the Institute of Child Health Niloufer Hospital for Women and Children, Hyderabad. It was designed to evaluate whether the timing of initiation of breastfeeding is associated with the risk of getting early onset neonatal sepsis. The analysis is based on the 50 singleton neonates born in January 2016 and February 2016.

Results: The breastfeeding was initiated within 1 hour of birth in 26 % of neonates. The breastfeeding was initiated among all the neonates except in 2% by the end of 72 hours of birth. The Neonates breastfed within one hour of birth did not develop Early Onset Neonatal Sepsis. The association between initiation of breastfeeding within 1 hour and protection against early onset neonatal sepsis was significant. The risk of getting early onset neonatal sepsis significantly increases with the increase in the delay in initiation of breastfeeding.

Conclusion: The initiation of breastfeeding within 1 hour as per WHO guidelines is a simple intervention that has the potential for significantly improving the neonatal outcomes. Breastfeeding promotion programs should emphasize the initiation within 1 hour.

Keywords: Initiation of Breastfeeding, Neonatal Sepsis

INTRODUCTION

Sepsis is the commonest cause of neonatal mortality. It is responsible for about 30%-50% of the total neonatal deaths in developing countries.¹ It is estimated that up to 20% of neonates develop sepsis.² Sepsis related mortality is largely preventable. The incidence of neonatal sepsis in India as per National Neonatal Perinatal Database (NNPD, 2002 - 03) is 30 per 1000 live births. Sepsis is one of the commonest causes of neonatal mortality responsible for 19% of all neonatal deaths.³ There is 22% reduction in Infant mortality by initiation of breastfeeding within one hour which is also a benchmark in WHO and UNICEF guidelines on Infant and young child feeding.³ Infant deaths can be reduced by 19 % by initiating breastfeeding within one hour.⁴ There is no extensive data about the incidence of sepsis in the absence of death if breastfeeding is initiated within one hour but majority of these deaths are a result of neonatal sepsis, which can be avoided due to early initiation of breastfeeding. It is observed that the colostrum fed babies or rather the babies who were initiated on breastfeeding within

one hour of delivery, have lesser signs of infection than those who were not.

Aim of the study was to study the effect of initiation of breastfeeding within one hour of birth on incidence of early onset neonatal sepsis.

MATERIAL AND METHODS

This non-interventional hospital based Cross-sectional study conducted at Institute of Child Health Niloufer Hospital for Women and Children. Institutional ethics committee approval was taken for conducting the research following the ethical guidelines. Permission for the data collection was obtained from the Superintendent of the Institute of Child Health Niloufer Hospital for Women and Children. Taking 20% as the prevalence of neonatal sepsis, with 95 % confidence and a relative precision of 20% a sample size of 400 was obtained. However, the present study done on a pilot basis with a sample of 50 singleton neonates. The Neonates and their mothers were contacted and informed written consent was obtained for data collection and examination of neonate for signs and symptoms of early onset Neonatal Sepsis. Systemic bacterial infections in neonates are known by the generic term neonatal sepsis, which incorporates septicaemia, pneumonia and meningitis of newborn. Early onset neonatal sepsis is the sepsis occurring within 72 hours of birth. In severe cases, the neonate may be symptomatic at birth.

Inclusion Criteria: Neonates without any antenatal complications, those delivered in the Institute of Child Health Niloufer Hospital for Women and Children and up to 3 days old were included in the study.

Exclusion Criteria: Babies born elsewhere, Babies not being able to breastfeed within an hour due to maternal complication like PPH, eclampsia, fever are not taken, Babies not being able to breastfeed within an hour due to neonatal complication like birth asphyxia, Hemorrhagic disease of newborn are not taken, and HIV positive mothers are not taken in this study.

Study tools: A standard pre tested questionnaire developed from the W.H.O evidence-based safe childbirth Checklist was used.⁵ Systematic random sampling was followed including every fifth neonate from the fifty bedded postnatal ward. Neonates were examined for the presence of following eight signs of sepsis, the

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presence of any one them indicates the neonatal sepsis as early as within 1 hour of birth⁵, Tachypnoea (more than 60 breaths per minute), Bradypnoea (less than 30 breaths per minute), Chest indrawing, Grunting, Convulsions, No movement on stimulation, Hypothermia (body temperature less than 36 degree centigrade). The other two features studied were the presence of umbilical redness extending to the skin and/or with draining pus. Data on Socio-demographic details and mothers knowledge about initiation of breastfeeding within one hour of child birth was also collected.

STATISTICAL ANALYSIS

Data collection and analysis was done using Epi Info version 7.1.5.2. Descriptive statistics were used to interpret results.

RESULTS

Table-1 Educational Status of Mother and Knowledge of initiation of Breastfeeding within 1 hour of birth and absolute breastfeeding for 6 months

30 (60%) of the mothers lack knowledge about initiation of breastfeeding within one hour of birth and absolute breastfeeding for 6 months, while 20 mothers (40%) had the knowledge. Majority of the primi para mothers were not aware about the breastfeeding initiation within one hour and absolute breastfeeding for six months (Table-2)

Early onset Neonatal Sepsis was found in 7 (14%) Neonates of upto 3 days old. Among them 4 (57.14%) were initiated breastfeeding later than 24 Hours but within 48 Hours, another one Neonate who developed sepsis was initiated breastfeeding later than 48 hours and within 72 Hours, and 2 (28.57%) had Breastfeeding initiated later than one hour of birth but within 24 hours. No neonate who were initiated breastfeeding within one hour of birth and kept on absolute breastfeeding developed Early Onset Neonatal Sepsis (Figure-1).

The incidence of Early Onset Neonatal Sepsis increases with the increase in delay in initiation of breastfeeding (Correlation coefficient (r) = 0.97).

The absence of Early Onset Neonatal Sepsis among the Neonates Breastfed within 1 hour is not by chance.

DISCUSSION

Majority of Neonates 38 (74%) in the study were of age of 2 days old, and 12 neonates (24%) were 3 days old. Majority of the mothers (70%) were of the age group 20-24 years, there were two cases (4%) of teenage pregnancies. Males constituted 36(72%) of the study participants, while females were 14 (28%). Among the study participants, 49 (98%) Neonates were Breastfed, only 13(26%) were initiated on breastfeeding within

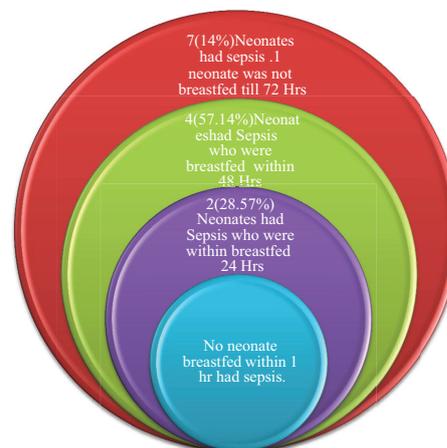


Figure-1: Early onset Neonatal Sepsis Among the study Participants

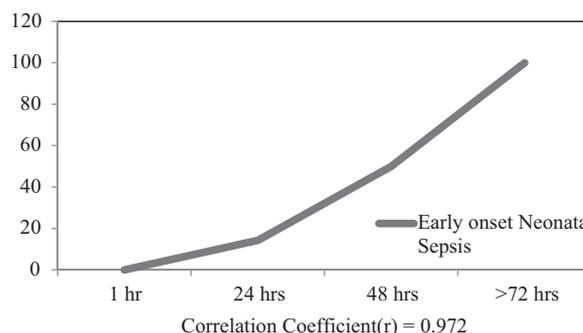


Figure-2: Incidence of Early onset Neonatal Sepsis and Time of Initiation of Breastfeeding.

Education Status (KuppuSwamy Scale)	Number of mothers having Knowledge of Breastfeeding Initiation within 1 hour and absolute breastfeeding for 6 months	Number of mothers not having Knowledge of Breastfeeding Initiation within 1 hour and absolute breastfeeding for 6 months.	Total
1 - Illiterate	3	8	11
3 – Middle School	4	8	12
4 – High School	6	12	18
5 – Intermediate/Post high School Diploma	4	2	6
6-Graduate/Postgraduate	2	0	2
7 - Professional	1	0	1
Total	20	30	50

Table-1: Educational Status of Mother and Knowledge of initiation of Breastfeeding within 1 hour of birth and absolute breastfeeding for 6 months

Timing of Breastfeeding Initiation	Early Onset Neonatal Sepsis Not Present	Early Onset Neonatal Sepsis Present	Total
Within 1 hour	13	0	13
Later than 1 hour	30	7	37
Total	43	7	50

Lancaster’s Mid – P value = 0.05

Table-2: Association of Early onset Neonatal Sepsis and Breastfeeding within 1 hour

one hour of birth, while 30(60%) were initiated breastfeeding later than 1 hour but within 24 hours and 6(12%) neonates were initiated breastfeeding later than 24 hours but within 48 hours.

The present study shows the initiation of breastfeeding within one hour of birth has a positive effect on protection against early onset neonatal sepsis (p -value 0.05). Study by Edmond KM et al showed 22% reduction in Infant mortality by initiation of breastfeeding within one hour.³ The study by Mullany et al showed that the infant deaths can be reduced by 19% by initiation of breastfeeding within one hour of birth.⁴ The study by Mullany et al showed Risk of early onset neonatal sepsis was 71% lower among babies breastfed within 1 hour.⁶ Another study by Mullany et al showed there was no statistically significant evidence to suggest that early breastfeeding initiation is protective against early onset neonatal sepsis.⁷ In a study conducted by Mullany et al it was seen that the adjusted prevalence rate of hypothermia was 16% lower among babies for whom breastfeeding was initiated within 24 hours of birth.⁸ The study by Van Den Bosch et al reported a significant association between early initiation and a reduction in low body temperature⁹ The study by Bamji et al reported a significant association between early initiation and a reduction in neonatal mortality.¹⁶ The study by Garcia et al reported Early breastfeeding initiation was associated with a lower risk of mortality: RR=0.56 (0.32, 0.97).¹⁷

CONCLUSION

This study emphasizes on the importance of early initiation of breastfeeding within 1 hour of birth and throws light on the role of breastfeeding in decreasing infant mortality as septicemia is leading cause of infant mortality.

Study limitations

Small Sample Size.

No long-term follow-up of healthy new-borns after 72 hours to see whether they developed infection later and financial limitations to call them for follow-up.

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