

Evaluation of P16^{INK4A} as a Biomarker in Cervical Intraepithelial Neoplasia

Shilpa Kava¹, Shalini Rajaram², Vinod K Arora³

ABSTRACT

Introduction: Cervical screening would benefit from a test based on a disease-specific biomarker that identifies high grade lesions, which could also indicate the presence of early precancerous lesions that have a high risk of progression to cancer. One such potential biomarker is p16^{INK4A}. Objective of the study was to study the biomarker p16^{INK4A} expression by immunostaining in cervical intraepithelial neoplasia.

Material and method: Experimental study conducted from November 2009 to April 2011. 1500 women were screened for cancer cervix using conventional Pap test, VIA and VILI. Women having positive results underwent colposcopy and biopsy if required. P16^{INK4A} expression in biopsy samples was studied using immunohistochemistry.

Results: All test positive cases n= 235, underwent colposcopy. Colposcopic abnormalities were detected in n=83 and biopsy proven cervical intraepithelial neoplasia(CIN) in n=15. P16^{INK4A} expression was seen in eight of 15 CIN cases. The strength of positivity of P16^{INK4A} was higher in CIN 2 and CIN 3 cases as compared to CIN 1. Also, the pattern of staining differed among various grades of CIN.

Conclusion: P16^{INK4A} expression was seen in majority of CIN 2 and CIN 3 lesions suggesting a higher grade lesion as compared to CIN 1. The discrimination between the lesions can be made without having to depend on traditional histopathology which gives a static picture of pre-invasive lesions of the cervix. This can help in differentiating high grade lesions from the lower grades, thereby helping in appropriate management of the cases.

Keywords: Cervical intraepithelial neoplasia, P16INK4A, PAP smear, colposcopy, cervical cancer

In developing countries simple, inexpensive visual based screening programs can be applied to a large population.^{3,4} VIA is a valuable screening tool in low-resource settings; however it has low sensitivity and specificity.⁵

Randomised controlled trials published recently have demonstrated that HPV testing can be efficiently integrated into primary screening, either as an adjunct to cytology or as a sole primary test.^{6,7} A single HPV DNA test although confirms infection by the virus, it does not discriminate between transient and persistent infection.⁸ The discrimination between the two types of infection is crucial as persistent infections can progress to cervical neoplasia.⁹

Thus cervical screening would benefit from a test based on a disease-specific biomarker that identifies high grade lesions. Such a marker would be useful if it could also indicate the presence of early precancerous lesions that have a high risk of progression to cancer. One such potential biomarker is p16^{INK4A}. Some preliminary studies suggest that p16^{INK4A} positive low grade lesions showed a greater frequency of progression than p16^{INK4A} negative lesions.¹⁰

p16^{INK4A} is a gene that is expressed by host cells in response to infection, and is not normally expressed in non-transformed cells.¹¹ In cervical carcinomas, the viral DNA of hrHPV (i.e. HPV 16 and 18) is integrated into the host genome at the E₂ region, resulting in overexpression of the oncoproteins E6 and E7. The E6 binds with the host p53 tumor suppressor gene protein product and degrades it, thereby disrupting its cell regulatory role.¹⁰ The E7 binds to and inactivates the tumor suppressor retinoblastoma protein (pRB) that inhibits the progression of cells into the S-phase. Consequently, loss of pRB function should result in the release of the p16^{INK4A} gene from negative transcriptional feedback control in the

INTRODUCTION

Cervical carcinoma is a leading cause of mortality and morbidity among women especially in the developing countries.¹ Current cervical cancer screening tests include Papanicolaou (Pap) test; visual inspection after the application of acetic acid (VIA); visual inspection after the application of Lugol's iodine (VILI) and Human Papillomavirus (HPV)-DNA testing.

The Pap test has decreased cervical cancer incidence substantially in the countries with regular screening programs.² However, the suboptimal reproducibility of the Pap test has to be compensated by frequent retesting.

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respective cells and in marked overexpression of p16^{INK4A} gene product.

Several properties of p16^{INK4A} make this protein a promising biomarker for HPV-related cancers; expression is directly linked to the HPV oncogene action, since continuous expression of E7 is necessary to maintain a malignant phenotype in HPV-associated cancer.¹² The expression of p16^{INK4A} seems to be independent of the HPV type causing the oncogenic infection, obviating the need to detect different HPV types in DNA and RNA assays.

MATERIAL AND METHODS

This is an experimental study conducted at the University College of Medical Sciences and Guru Teg Bahadur Hospital, Delhi, India from November 2009 to April 2011.

1500 women were screened for cancer cervix using conventional Pap test, VIA and VILI. Women who had positive results in any of the above tests underwent colposcopy. Biopsy was taken from the abnormal areas detected at colposcopy. P16^{INK4A} expression in the biopsy samples was studied using immunohistochemistry. A written informed consent was taken from all patients. Sexually active women in the age group of 20-50 years were included in the study. Women with an obvious cervical growth, acute cervicitis, prior surgery on the cervix, postmenopausal and pregnant women were excluded from the study.

A detailed history including marital, sexual, obstetric, menstrual and personal history was taken. This was followed by a detailed examination which included general physical and systemic examination. Prior to per vaginal examination following screening tests were performed.

1. Screening tests

Papanicolaou test (PAP test): Conventional PAP test was performed and results were reported according to the Bethesda 2001 System of reporting cervico-vaginal smears. A Pap test of ASCUS and above was taken as positive

B. VIA and VILI: 5% acetic acid was applied liberally using a cotton swab soaked in acetic acid over the exposed cervix. The findings were read after one minute of application. After carefully recording the findings, Lugol's iodine was applied with a cotton swab on the cervix. The cervix was examined for any iodine non-uptake areas. The outcome of VIA and VILI was interpreted as per the International Agency for Research on Cancer (IARC) guidelines.¹³

2. Colposcopy - All women having positive result through either PAP test, VIA or VILI underwent colposcopy. In dorsal position, cervix was exposed and using the colposcope, the transformation zone of the cervix was visualized for any abnormal areas. The abnormal areas included acetowhitening, atypical vessels, punctations, mosaic pattern, iodine negativity. A biopsy was then taken from these abnormal areas.

3. Histopathology - A colposcopy directed single/ multiple punch biopsy of the suspicious areas was taken and transported to the pathology lab in 10% formalin. The results of the biopsy were reported as a) Chronic cervicitis a) CIN 1 b) CIN 2 c) CIN 3 d) Microinvasive cancer e) Invasive cancer.

Immunostaining for p16^{INK4A} - For immunohistochemistry, representative sections from paraffin block of cervical biopsy were taken on poly-L-lysinate coated slides. Antigen was retrieved by microwave heat method using citric acid buffer at pH 6.0. Immunohistochemistry was performed using standard technique by Streptavidin biotin system using DAB as chromogen. Patterns of p16^{INK4A} were categorised as positive or negative. Positive p16^{INK4A} was defined as presence of nuclear staining or diffuse cytoplasmic staining. Negative p16^{INK4A} was defined as absence of any staining or presence of focal cytoplasmic staining. Specifically, diffuse staining was defined as a continuous staining of cells in the basal and parabasal layers (with or without staining of superficial squamous cell layers). Focal staining was defined as non-continuous staining of isolated cells or small cell clusters, usually not located in the basal and parabasal layers. Degree of nuclear p16^{INK4A} expression in positive cases were expressed as percentage of positive cells. Strength of positivity was compared to a positive control which could be run with each batch of immunostaining.

The strength of reaction was graded as 1+, 2+ and 3+.

Positive control: Squamous cell carcinoma of esophagus

Negative control: Obtained by omitting the application of primary antibodies during the immunostaining process and using Tris Buffer Saline instead.

RESULTS

One out of the six samples of CIN-1 was damaged during the staining process. P16^{INK4A} was negative in four of the five CIN-1 biopsy samples that were stained. Only one CIN-1 biopsy showed positive P16^{INK4A}; with no cytoplasmic staining, 9% nuclear staining and strength of positivity 1+ (Figure 1).

P16^{INK4A} was positive in four of the five CIN-2 biopsy samples that were stained, with diffuse cytoplasmic staining. Nuclear staining in these cases ranged from 16% to 27% and strength of positivity was 2+ in three cases and 1+ to 2+ in one case. One CIN-2 biopsy sample showed negative p16^{INK4A} staining, with only focal cytoplasmic staining and negative nuclear staining. Positivity of p16^{INK4A} in CIN-2 was 80% (Figure 2).

P16^{INK4A} was positive in two of the three CIN-3 biopsy samples that were stained, with diffuse cytoplasmic staining. Nuclear staining in these two cases was 32% and 64% and strength of positivity was 2+ and 3+ respectively. One CIN-3 biopsy sample showed negative p16^{INK4A} stain (Figure 3). P16^{INK4A} was positive in the one case of squamous cell carcinoma.

noma that was detected in this study, with diffuse cytoplasmic staining, 90% nuclear positivity and strength of positivity 3+ (Figures 4). P16^{INK4A} expression in the various cases of CIN/SCC has been shown in Table 1. P16^{INK4A} immunostaining was also performed in 10 histopathologically proven cases of chronic cervicitis. P16^{INK4A} was negative in eight of the 10 cases (Figure 5). In the two cases of chronic cervicitis in which P16^{INK4A} was positive there was diffuse cytoplasmic staining and no nuclear staining.

DISCUSSION

A serious disadvantage of the grading by conventional histopathology is that the three distinct grades used in CIN can easily give a faulty static impression of a solidified sculpture, as if CIN were a static event, whereas in reality a CIN lesion is a dynamic process that can progress and persist but also regress. Compounding the above are the well-known issues of intraobserver and interobserver reproducibility, which, for grading of CIN, is far from perfect.¹⁴ It is also difficult to distinguish CIN reliably from non-neoplastic lesions, resulting in either overtreatment or undertreatment. These points emphasise the need for adjuvant methods to interpret the actual morphological impression of a CIN lesion in dynamic terms rather than in static morphological grades. Without doubt, p16^{INK4A} is the most widely available, robust, stable and strong predictive biomarker currently available for prognosticating CIN lesions. p16^{INK4A} overexpression has been demonstrated in the vast majority of cervical precancers and cancers while in normal tissue, p16^{INK4A} expression is found only rarely.¹⁵ This was also shown in our study where among the 10 morphologically proven cases of chronic cervicitis p16^{INK4A} only two showed diffuse cytoplasmic staining and no nuclear staining. Until now, despite several proposed evaluation strategies of p16^{INK4A} in both cytology and histology, there is no general consensus for establishing threshold values above which a sample becomes “p16^{INK4A}-positive.”¹⁶

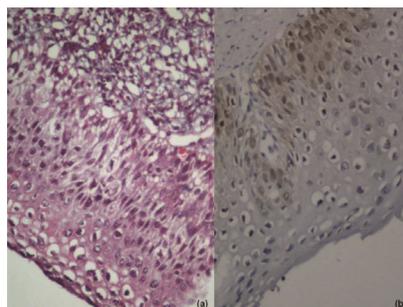


Figure-1: (a) H&E X 200: CIN I, (b) p16^{INK4A} Immunoreactivity seen in lower 1/3 epithelium with some nuclei showing positivity in middle 1/3

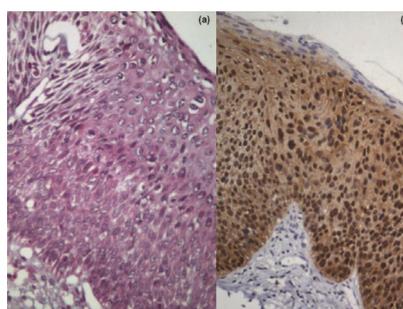


Figure- 2: (a) H&E X 200: CIN II, (b) p16^{INK4A} Immunoreactivity: Nuclear positivity present throughout the epithelium with nuclei showing intense positivity in focal areas

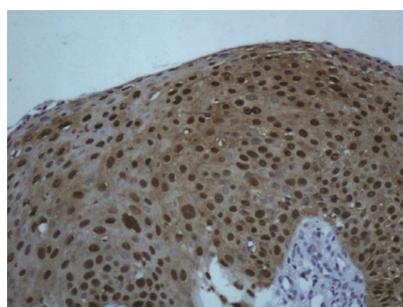


Figure-3: CIN III: p16^{INK4A} Immunoreactivity seen in nuclei and cytoplasm

S. No	Histopathology*	P16 ^{INK4A} , IHC**, result	P16 ^{INK4A} cytoplasmic staining	P16 ^{INK4A} nuclear staining	Strength of positivity
1.	CIN-1	Negative	Negative	Negative	Negative
2.	CIN-1	Negative	Negative	Negative	Negative
3.	CIN-1	Negative	Negative	Negative	Negative
4.	CIN-1	Negative	Negative	Negative	Negative
5.	CIN-1	Positive	Negative	9%	1+
6.	CIN-2	Positive	Diffuse	22%	2+
7.	CIN-2	Positive	Diffuse	18%	1+ to 2+
8.	CIN-2	Positive	Diffuse	16%	2+
9.	CIN-2	Positive	Diffuse	27%	2+
10.	CIN-2	Negative	Focal	Negative	Negative
11.	CIN-3	Negative	Negative	Negative	Negative
12.	CIN-3	Positive	Diffuse	32%	2+
13.	CIN-3	Positive	Diffuse	64%	3+
14.	Squamous cell carcinoma	Positive	Diffuse	90%	3+

*1 sample of CIN 1 lost during processing, **IHC: Immunohistochemistry

Table-1: Cytoplasmic and nuclear p16^{INK4A} expression in CIN and squamous cell carcinoma cases

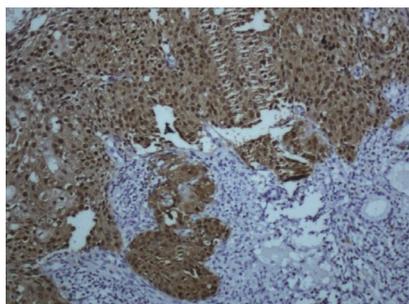


Figure-4: Squamous cell carcinoma. p16^{INK4A} Immunohistochemistry showing intense nuclear and cytoplasmic positivity



Figure-5: IHC X20 negative P16^{INK4A} in chronic cervicitis

Klaes and colleagues¹⁵, proposed a system which scored the distribution of p16 positivity on a semiquantitative scale as follows: negative (<1% of the cells were positive), sporadic (isolated cells were positive, but <5%), focal (small cell clusters, but <25% of the cells were positive), diffuse (>25% of cells stained positive).

In the present study patterns of p16^{INK4A} staining defined was a modification of that of Klaes et al¹⁵, where we reported cases as negative, focal or diffuse, and also graded nuclear positivity as a percentage.

CONCLUSION

Though p16^{INK4A} has been analyzed in a number of studies, there is undoubtedly some way to go before we can say how they will “best fit” to improve the diagnosis of cervical neoplasia, as either stand alone or as adjunctive tests, in triage or in primary screening contexts. For this we need more clinical data, particularly sufficiently planned, longitudinal studies where the candidates are assessed alongside concurrent pathology.

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Clinical Profile, Intraoperative Challenges During Cataract Surgery in Patients with Pseudoexfoliation and Visual Outcome at Rural Set up

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ABSTRACT

Introduction: Pseudoexfoliation (PXF) is an ocular manifestation of systemic degenerative disorder. Many recent studies have shown that patients with PXF have higher rate of complications during cataract surgeries compared to patients without this disorder.

Material and method: In this hospital based, observational, descriptive study, we studied the clinical profile and intraoperative difficulties in 50 patients of senile cataract with PXF undergoing cataract surgery at the rural hospital for two years (September 2013- August 2015).

Results: Out of 50 study patients mean age was 67.4 ± 7.52 years. 25 (50%) were males. 31 (62%) patients had clinical bilateral involvement of PXF. 14 (28 %) patients had PXF material deposited on only pupillary margin. 26 (52%) had nuclear cataract. 31 (62 %) patients had insufficient intraoperative mydriasis for which intraoperative mechanical stretching worked well in 25 (50 %) patients while 6 (12%) patients needed additional sphincterotomy. 5 patients (10%) developed posterior capsule rupture (PCR) out of which 2 (4%) had vitreous loss with iridodialysis. 1 patient (2%) had ACIOL while 1 was kept aphakic.

Conclusion: Careful preoperative evaluation with slit lamp is mandatory in patients undergoing cataract surgery having PXF, to avoid the intraoperative complications. Surgical modifications for pupil enlargement reduce the intraoperative complications.

Keywords: Pseudoexfoliation, PXF, Cataract surgery in PXF, Clinical profile of PFX

lary dilatation is needed as PXF frequently goes undiagnosed leading to unexpected problems in surgical management.^{4,5} The risk of intraoperative problems, such as a poorly dilating pupil, zonular weakness, phacodonesis predisposes to capsular break, and vitreous loss and postoperative complications including fibrinoid reaction, posterior synechiae, cell deposits, and capsule contraction.⁶ Preoperative and intraoperative measures to avoid or minimize these complications include a careful slit lamp examination after full pupillary dilatation, adequate control of preoperative intraocular pressure, intraoperative adequate pupillary dilatation medically or surgically and avoidance of iris manipulation.^{7,8} PXF syndrome should not be considered as harmless anomaly of the anterior segment but as a potentially catastrophic disease. In this study preoperative clinical profile of PXF patients with cataract, the intraoperative events and their management will be studied. With this study one can know the rate of complications, can learn how to avoid them and manage if they occur and may know ocular risk factors which technically lead to the intra-operative complications. Thus, with predictions and judgment one can take proper care of such risk factors and reduce the rate of complications during cataract surgeries in PXF patients. Aim and objective of the study was to study the clinical profile and intraoperative difficulties during cataract surgery in patients with PXF at rural hospital.

MATERIAL AND METHODS

This descriptive, observational, hospital based study was carried out in 50 patients of senile cataract with PXF undergoing cataract surgery at rural hospital for 2 years i.e. September 2013 to August 2015 which was approved by the

INTRODUCTION

Pseudoexfoliation is a generalized disorder of extracellular matrix. It is an ocular manifestation of systemic degenerative disorder. Clinically PXF is manifested by presence of whitish granular dandruff-like deposits on iris, pupillary margin, anterior lens capsule, ciliary body, zonules and there may be iris atrophy with moth-eaten appearance of iris on transillumination test.¹ Elevated intraocular pressure (IOP) has been reported in eyes with PXF. Patients with PXF are twice as likely to convert from ocular hypertension to glaucoma and are more likely to develop glaucoma at all IOPs.^{2,3} For PXF diagnosis a careful slit-lamp examination after pupil-

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Institutional Ethical committee and written informed consent was obtained prior to the study from all patients. All willing patients above 40 yrs admitted for cataract surgery having PXF at Rural Hospital were included while patients with PEX undergoing combined surgeries with previous intraocular surgeries or trauma, posterior synechiae, pigment dispersion were excluded.

Methodology

We recorded the pre operative, intra operative data in all 50 patients with PXF who were undergoing cataract surgery, from patients' medical records for 2 years.

Preoperative data

Consisted medical, ocular history, preoperative visual acuity, slit lamp biomicroscopy with and without pupillary dilatation with special emphasis on PXF material at the pupillary margin and anterior capsule of lens as zones of PXF on anterior lens capsule, anterior chamber (AC) depth and pigment dispersion in the AC, iridodonesis, posterior synechiae, phacodonesis or frank subluxation or dislocation of lens, pupillary reactions, measurement of pupil size before and after dilatation of pupil, and IOP apart from routine ocular investigation for cataract surgery like lacrimal sac syringing and IOL power.

Intra-operative

Intra-operative data was also collected from records as: Pre-operative maximum dilatation of pupil with combination of 5% Phenylephrine Hydrochloride and 0.8% Tropicamide eye drops, technique of extra capsular cataract extraction performed (MSICS), surgical modifications like mechanical stretching, additional sphincterotomy, type of capsulotomy, method of nucleus delivery, type of IOL, any complication occurred and its management were recorded.

Parameters studied

Pre and intraoperative pupillary size, method of its dilatation, variation in operative procedure due to insufficient mydriasis, type of complication and its management.

RESULTS

Out of 50 patients with PXF average age of patients was 67.4 ± 7.52 years and 43 (86 %) patients were above 60 yrs of age. 25(50%) were males (Table 1). 31 (62%) had clinical bilateral involvement of Pseudoexfoliation. 36 (72 %) patients had PXF deposition on both peripheral zone and central zone while 14 (28 %) had PXF material deposited only on the pupillary margin. 10 patients (20%) had iridodonesis clinically. 17 (34%) patients had Mature Cataract, 2(4%) had hypermature cataract. 26(52%) had nuclear sclerosis and 5 (10%) had cortical cataracts (Table 3). Range of IOP was from 10.2 mmHg to 20.6 mmHg with an average IOP reading of 15.49 ± 2.91 mmHg. 31 (62 %) patients had

insufficient intraoperative mydriasis (Table 2). 31 (62%) patients required mechanical stretching during surgery because of insufficient mydriasis and out of them 6 (12%) patients required additional sphincterotomy. 5 patients had posterior capsular rent in which 4 (80%) had insufficient mydriasis while 1 (20%) had adequate mydriasis but weak zonules. Out of these 5 PC rent (PCR) patients 3 had only PCR while 2 had Vitreous loss with Iridodialysis (Table 4). Out of 50 patients with PXF, 48 (96%) patients had PCIOL implantation while 1 patient (2%) had ACIOL and 1 (2%) patient was left aphakic.

DISCUSSION

Pseudoexfoliation being a degenerative condition average age of patients in our study was 65.83 years similar to study conducted by Anuradha et al²³ who showed 22 (73.33%) patients were above the age group of 60 years. They noted exfoliation in 31% of women and 40% of men however in present study there was equal incidence of pseudoexfoliation among males and females.

Clinically evident exfoliative changes are initially unilateral in patients with PXF and later become bilateral over time. The so called "unilateral" PXF may have early subclinical exfoliation.⁹ In the study conducted by Jawed et al.²⁶ It was found that bilateral pseudoexfoliation was more common than unilateral which was in coherence with the present study. Deposition of exfoliative material on anterior lens surface is the most common feature of PXF and is best appreciated after pupillary dilatation.⁹ Generally a bull's-eye pattern is seen consisting a translucent central zone and a granular

Age (Years)	Male	Female	Total
40-50	1	1	02
51-60	2	3	05
61-70	16	14	30
71 and above	6	7	13
Total	25	25	50

Table-1: Showing age and sex distribution of 50 study patients with PXF

Pupillary Diameter	No Of Cases	%
<6mm	31	62
>6mm	19	38
Total	50	100

Table-2: Showing the pupillary diameter in 50 study patients with PXF

Cataract type	No of cases	%
Hypermature	02	04
Mature	17	34
Nuclear sclerosis	26	52
Cortical	05	10
Total	50	100

Table-3: Showing distribution of type of cataracts in 50 study patients.

Intra operative challenges	No of cases out of 50	%	Mydriasis
Mechanical stretching	31	62	< 6mm.
Additional Sphincterotomy	6	12	< 6mm.
Conversion of CCC to capsulotomy	18	36	< 6mm.
Difficulty in nucleus prolapse in AC	31	62	< 6mm.
Posterior capsular rent (PCR)	5	10	< 6mm.
PCR+*VL+ Iridodialysis	2	4	< 6mm.
Conversion of PC to AC IOL	1	2	< 6mm.
Conversion to Aphakia	1	2	< 6mm.
(*Same patient had 2 or 3 complications.)			
Table-4: Showing distribution of surgical variations, intraoperative challenges and association of poor mydriasis during cataract surgery in 50 study patients with PXF.			

peripheral zone of deposition separated by an intermediate clear zone presumably due to lens contact with movement of iris. It may be diffusely scattered over not only the peripheral iris surface but may be deposited on or anterior to Schwalbe's line^{10,11} (Sampaolesi's line). In 20% of patients with exfoliation, the central zone may be absent and to see the presence of PXF dilatation of pupil and slit lamp examination is mandatory.¹² In our study, 36 (72%) patients had PXF deposition on both peripheral zone and central zone as against Anuradha et al²³ who observed 80% PXF material on the pupillary margin.

Tremuloscence of iris is called Iridodonesis which is associated with phacodonesis or lens luxation in PXF due to degeneration of zonular fibers.¹³ Spontaneous dislocation of the lens into the vitreous has been reported. In the present study, pre operative examination revealed presence of iridodonesis in 10 (20%) patients which was higher as compared that observed by Anuradha A et al²³ (3.33%).

Nuclear cataracts and subcapsular cataracts are more frequently found in eyes with PXF than in eyes without PXF and PXF has a higher prevalence in eyes with cataract.¹⁴ Cataract formation may be related to ocular ischemia, aqueous hypoxia, reduced protection against ultraviolet radiation. Ascorbic acid, that plays an important role in protecting the lens from ultraviolet irradiation, has been found reduced in the aqueous humor of patients with PXF deposits. In the study conducted by Pranathi et al²⁵ (13.46%) 7 eyes of PXF had nuclear cataract while our study showed higher incidence of nuclear cataract 26 (52%) in PXF patients, may be due to rural patients more exposed to sun light, supports the strong association of pseudoexfoliation with nuclear cataracts.

Elevated intraocular pressure (IOP) has been reported in eyes with PXF. Patients with PXF are twice as likely to convert from ocular hypertension to glaucoma and are more likely to develop glaucoma at all IOPs which is known as glaucoma capsularae.¹⁵ Out of 50 patients in the present study group, the pre operative average IOP was 15.49 mmHg which was

on lower side than studies by Pranathi et al, Jawed et al and Sushilkumar KA et al^{25,26}

Typically, the pupil dilates poorly in an exfoliative eye. This is partly caused by atrophy and degeneration of the iris muscle cells. Poor mydriasis during surgery has been found to be one of the major factors that lead to complications in patients with pseudoexfoliation during cataract surgery.¹⁶ In present study insufficient mydriasis < 6mm was seen in 31 (62%) patients which was more than other studies as 48% shown by Jawed et al and 14 (46.67%) by Anuradha A et al.^{26,23}

Sufficient mydriasis is required intraoperatively. Pharmacologically nonsteroidal anti-inflammatory drops with mydriatics and intracameral adrenaline can help to expand the pupil. Mechanical enlargement of the pupil includes stretching, sphincterotomy as well as iris hooks and pupil dilator rings.¹⁷ To facilitate capsulorrhexis and nucleus delivery mechanical stretching of the pupil is required in ECCE. If pupil cannot be enlarged sufficiently with stretching, radial sphincterotomies can be considered which may not be good cosmetically but give safer pupil access and better post operative results. Increased force needed to extrude the lens through a small pupil with the increased risk of posterior capsule rupture leads higher frequency of intraoperative complications in ECCE.¹⁸ In our study mechanical stretching of the pupil was required in 31 (62%) of the patients Additional sphincterotomy was required in 6 (12%) cases. This finding was contradictory to Sushilkumar K et al¹⁹ where only 12 (20%) patients required mechanical stretching.

Peripheral PXF material which is hidden behind the iris is clinically invisible, but it is responsible for the instability of zonular attachment. In Small incision surgery, controlled paracentesis and adequate hydrodissection are some more useful strategies. Adequate hydrodissection as well as the use of viscodissection to separate cortex from the capsule facilitate cortex removal. In the can-opener capsulotomy, both loops of the one-piece PMMA lenses, provide stronger resistance to capsule contraction due to their haptics.^{20,21,22}

Separation of iris from its root is known as iridodialysis which can be due to excess handling of iris during surgery. Insufficient mydriasis may lead to iridodialysis during vectis delivery of nucleus. In present study 2 (4%) patients had iridodialysis.

Insufficient mydriasis may lead to PC rent during nucleus delivery in AC or I/A wash step. We found Posterior Capsular Rent (PCR) in 5 (10%) cases out of which 2(4%) patients had vitreous loss with iridodialysis and 1 of them got ACIOL and one kept aphakic. The other 3 patients had only PCR without vitreous disturbance so implantation of rigid PMMA-PCIOL in sulcus was carried out. Out of 5 (10%) patients with PC rent insufficient mydriasis and rigid pupil was present in 4 (8%).

Pranathi et al²⁵ observed vitreous loss in 4 (7.7%) patients with PXF. Anuradha et al²³ reported 3 (10%) aphakic patients while Abid Naseem et al²⁴ reported 2 (6.3%) patients with ACIOL.

CONCLUSION

Careful preoperative evaluation with slit lamp is mandatory in patients having pseudoexfoliation, who are undergoing cataract surgery to avoid intraoperative complications. Surgical modifications for pupil enlargement reduce the intraoperative complications.

LIMITATIONS OF STUDY

1. Inclusion of PXF patients with iridodonesis, phacodonesis which is a complication already occurred preoperatively.
2. Inclusion of patients operated by many surgeons and not consideration of the operative skill factor.

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Study of Primary Anterior Chamber Intraocular Lens Implantation in Senile Cataract Patients at Rural Set up

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ABSTRACT

Introduction: When posterior capsular rent (PCR) occurs during cataract extraction, surgeon has to consider primary or secondary anterior chamber intraocular lens (ACIOL) or scleral fixated IOL (SFIOL). We considered primary ACIOL with the use of single piece Polymethyl - Methacrylate Posterior Chamber Intraocular Lens (PMMA – PCIOL) in stock to avoid aphakic (No IOL) vision in rural patients, who may lose follow up for secondary IOL.

Material and Method: In this hospital based observational longitudinal 2 years study (September 2007 to August 2009) 20 patients were studied after their written consent in local language and institutional IEC permission. We studied the intraoperative events in ACIOL implantation with PCIOL model, its management, early postoperative complications and 3 months postoperative visual outcome at rural hospital.

Results: There were 10 (50%) male patients. 8 (40%) patients were in the range of 50-60 year age group. 8 (40%) underwent conventional Extra Capsular Cataract Extraction (ECCE) and 12 (60%) had Small Incision Cataract Surgery (SICS) technique. 15 (75%) patients showed vitreous disturbance with PC rent and remaining had only PC rent without vitreous disturbance. 3 months postoperatively, all 20 patients had clear corneas without Anterior Chamber (AC) reaction. 2 patients (10%) needed YAG laser iridotomy for raised intraocular pressure (IOP) due to partial Peripheral Button Hole Iridectomies (PBIs), 7(35%) patients had oval pupil, 2 (10%) had cystoid macular edema (CME), 10 (50%) patients had Best Corrected Visual Acuity (BCVA) >6/18 and 19 (95%) got BCVA >6/60.

Conclusion: Prognosis of various ACIOL models must be depending on severity of ocular tissue handling mainly presence or absence of vitreous disturbance and its proper and timely management.

Keywords: ACIOL implantation, PC rent management, Complications of ACIOL.

rior chamber IOL (ACIOL) or scleral fixated IOL (SFIOL). Old models of ACIOL has given many disasters postoperatively including uveitis-glaucoma-hyphema (UGH) syndrome and retinal detachment (RD) due to their defective designs.¹ Newer ACIOLs give better results to some extent. However even these lenses may need explanation due to their complications.² Many times these newer ACIOLs may not be in stock to go for primary ACIOL implantation. Though sporadic, we have seen patients with PCIOL implanted in AC with quiet eyes for years (6-12 years). So we considered primary ACIOL with the use of single piece PMMA - PCIOL in stock to avoid aphakic vision in rural patients, who may lose follow up for secondary IOL. Aim of the study was to study the visual outcome and immediate postoperative complications of primary ACIOL with the use of routine single piece PMMA PCIOL at rural hospital.

MATERIAL AND METHOD

This descriptive, observational, longitudinal hospital based study was carried out in 20 patients of Posterior Capsular Rent undergoing primary ACIOL with PCIOL model at rural hospital for 2 years i.e. September 2007 to August 2009 which was approved by the Institutional Ethical committee and written informed consent was obtained prior to the study from all patients. All willing patients above 50 yrs with advanced senile cataract having visual acuity <5 meter, with preoperative normal anterior and posterior segments and normal biometric readings, operated for cataract surgery with both conventional ECCE and SICS techniques having unfortunate intraoperative PC rent at Rural Hospital were included. We excluded patients having other anterior or posterior segment problems and also hypertensive, diabetic and non willing patients.

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INTRODUCTION

During cataract extraction with any technique like conventional Extracapsular extraction (ECCE) or small incision cataract surgery (SICS) when unfortunate posterior capsular rent (PCR) with or without vitreous disturbance occur, surgeon has to consider primary or secondary IOL either ante-

Methodology

We recorded patients' preoperative history, slit lamp examination, intraoperative PC rent management steps in both conventional ECCE and SICS techniques for primary ACIOL implantation with PCIOL model. After PC rent, pressure on eyeball was removed, started I/V 20% Mannitol drip (1.5gm/kg), pupil was constricted with intracameral pilocarpine and air was injected in AC. After measuring white to white on table routine PMMA single piece PCIOL with 2 diopter less power than calculated IOL power was implanted in AC, maintaining round pupil under viscoelastic in patients with only PC rent without vitreous disturbance.

In patients with vitreous disturbance, open sky vitrectomy followed by IOL implantation under viscoelastic followed by, 2 peripheral buttonhole iridectomies (PBI) and suturing with 10-0 nylon was carried out in conventional ECCE, while in SICS technique after IOL implantation under viscoelastic, first the incision was extended on both sides of the tunnel followed by 2 PBIs. Then the AC was formed with air and saline and the extended side incisions were sutured with 10-0 nylon suture and well covered with conjunctiva. We used injection of subconjunctival antibiotic-steroid combination and eye path with bandage for 24 hours. Post operatively short term systemic and long term topical antibiotic and steroid were given in tapering dose. All patients being rural, we treated them for 7 indoor days.

Parameters studied

Daily slit lamp examination of wound, sutures, cornea, AC depth, position of ACIOL, shape and size of the pupil, pa-

tency of 2 PBIs, intraocular pressure (IOP) on Non Contact Tonometer (NCT), ophthalmoscopy and visual acuity (VA) with Snellen's chart were recorded. Same follow up records made on 90th day.

RESULTS

There were 10 (50%) males. Maximum patients (40%) were in the range of 50-60 year age group (Table 1). Out of all 20 study cases who underwent primary ACIOL, 8 (40%) underwent conventional ECCE and 12(60%) had SICS technique. In 75% patients (15 cases) showed vitreous disturbance with PC rent, while in 25 % (5 cases) there was only small PC rent without vitreous disturbance. On first POD all patients had good wound approximation with in situ sutures. Thirteen patients had clear corneas on 1st POD, 5 patients cleared at 1 month and all 20 patients had clear corneas after postoperative 3 months. In 4 patients there was mild AC reaction on 1st POD. However it cleared after 3 months postoperatively. In 2 patients (10%) who had partial PBIs, we noticed raised IOP which was treated successfully with YAG- laser iridotomy. In all patients ACIOL was in situ, however 7 patients had oval pupil. Fundus showed clear media around postoperative 3 months in all patients, out of which 2 had (CME) cystoid macular edema and 2 had ARMD (age related macular degeneration) (Table 2). and (Photos-1, 2, 3) Three months postoperatively, 50% patients had BCVA >6/18, 70% had >6/24, and 95% got BCVA >6/60 (Table 3).

DISCUSSION

After extra capsular cataract extraction by any technique, intraoperative posterior capsular rent with or without vitreous disturbance can occur. This is treated with either primary or secondary ACIOL or SFIOL or iris fixated IOL implantation.^{2,3}

Old models of ACIOL are now obsolete due to their post operative complications.^{4,5,6} Newer ACIOLs like Kelman Multiflex give better results to some extent. However even these

Age	Male	Female	
50-60	2	6	8(40%)
61-70	4	2	6(30%)
71-80	2	2	4(20%)
>80	2	0	2(10%)
Total	10(50%)	10(50%)	20(100%)

Table-1: Showing age and sex distribution of the 20 study cases

	1 ST POD	7 TH POD	30 TH POD	90 TH POD
WOUND	Opposed	Opposed	Opposed	Opposed
SUTURES	In situ	In situ	In situ	In situ
CORNEA	Clear-7 Hazy-13 Mild-6 Mod- 5 Severe-2	clear-13 hazy-7 Mild-5 Mod-2	clear-18 hazy-2 Mild-2	clear-all
AC DEPTH	N-18 Irregular 2Requierd YAG PBI	N-All	N-All	N-All
AC REACTION	NO-4	NO-14	NO-16	NO- All
IOP-NCT	N-18 High-2 Post YAG- N	N-ALL	N-ALL	N-All
ACIOL	In situ all	In situ all	In situ all	In situ all
	1ST POD	7TH POD	30TH POD	90TH POD
PUPIL	Round-13 Oval-7	Round-13 Oval-7	Round-13 Oval-7	Round-13 Oval-7
FUNDUS	Clear-7	Clear-13	Clear-18	Clear-20 ARMD-2, & CME-2, NF-16.

Table-2: Showing postoperative slit lamp examination of 20 study cases.

Visual acuity	% of cases
>6/18	50%
>6/24	70%
>6/36	85%
>6/60	95%
CF 4-5 meter	100%

Table-3: Showing 3 months postop BCVA in 20 study cases in %

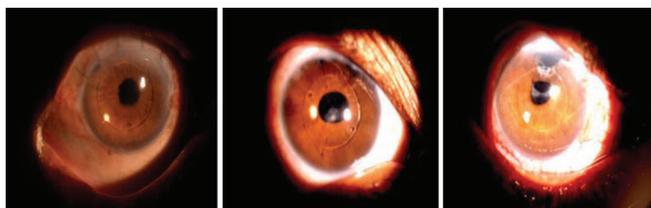


Figure-1: Postoperative Photos 1, 2, 3 showing ACIOL in AC with quiet eye and clear cornea.

lenses may need explantation due to either their inverted placement or other complications and may need penetrating keratoplasty due to corneal decompensation.⁷

Thus nothing is standard till date as far ACIOL model is considered.⁸ Many times these IOLs may not be in stock as routine single piece PMMA PCIOLs. In rural area, patients' loose follow ups for secondary IOL and may prefer aphakic vision even without spectacles. Most important point is that though sporadic cases, we have seen such PCIOLs in AC and happy patients with good vision and quiet eyes for years (6-12 years). So we considered primary ACIOL with the use of single piece PMMA PCIOL to avoid aphakic vision in patients, who may lose follow up for secondary IOL.

We have not found any similar study in the literature till date and so not having any similar direct references. We are presenting the Photographs and BCVA records.

In our study no patient had UGH (uveitis, glaucoma, hyphema) syndrome or RD (retinal detachment) or IOL explantation. Success rate in our study may be due to patient selection criteria, minimal surgical intervention, use of viscoelastic material, flexibility of haptics, proper placement of correct sized IOL, use of required IOL power in AC, 2PBIs, indoor patient for 7 days with daily slit lamp examination which allowed proper and timely postoperative intervention like non contact tonometry (NCT), YAG iridotomy and use of systemic steroids.

Hennig A et al, has shown high volume ICCE with ACIOL study complications even with newer ACIOL as 1-10% CME after Subclinical uveitis, 1-7.8% corneal decompensation, 0-15% Glaucoma, 0-4% Retinal detachment and 0.2% Endophthalmitis.⁹ Newer ACIOLs like Kelman Multiflex also had complications like upside down syndrome and may need explantation.¹⁰ Every first thought or procedure is an experiment and many surgeons might have done or at least seen such PCIOLs in AC and happy patients with good vision and quiet eye for years. According to Allen Foster "It is not so much the car (IOL) that causes the accident, as the driver (surgeon)".¹¹

Surgical variation done for good, sometimes helplessly but with good intention and hope, with known previous good results by others, though undocumented and not presented was the 'drive' for this study.

With this article we are sharing the good post operative results in our rural set up without giving any take home message. However one may suggest IOL making companies to consider this type of ACIOL model with better design.

CONCLUSIONS

Prognosis of various ACIOL models must be depending on severity of ocular tissue handling mainly presence or absence of vitreous disturbance and its proper and timely management.

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Is there a Correlation between Seventeen Site Sonologic Skin Thickness and Severity of Interstitial Lung Disease in Patients with Scleroderma Related Interstitial Lung Disease ?

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ABSTRACT

Introduction: Scleroderma, also known as Systemic Sclerosis (SSc), is an autoimmune disease characterized by diffuse fibrosis of skin and internal organs. Pulmonary involvement is commonly silent, whereas skin fibrosis is the usual clinical feature drawing patient's attention. Interstitial lung disease (ILD) is a common and serious complication of Scleroderma. The aim of this study was to investigate the relationship between seventeen site sonologic skin thickness and severity of Interstitial lung disease (ILD) as determined by high resolution computed tomography score for ILD in patients with Scleroderma related interstitial lung disease (SSc-ILD) and thus reducing patients exposure to radiation.

Material and Methods: The study comprised of 30 consecutive patients of scleroderma with pulmonary involvement. All patients underwent high resolution computed tomography (HRCT) scan of the lungs, pulmonary function test (PFT) and high resolution ultrasonography (USG) of the skin. The severity and extent of SSc – ILD was evaluated by a semi – quantitative scoring system. Full skin' thickness was measured on high resolution USG at seventeen sites corresponding to those of modified Rodnan skin score and total sonologic skin thickness was obtained by summing the skin thickness of all the seventeen sites in each patient.

Results: The sum of seventeen site sonologic skin thickness was 26.41 +/- 4.27mm. The "total HRCT score" for ILD was 25 +/- 4

Conclusion: The current study failed to establish any definite correlation between seventeen site sonologic skin thickness and severity of ILD as determined by "total HRCT score". However, a multi-centric study involving a larger number of patients is required to further investigate the relationship

Keywords: Systemic Sclerosis; SSC-ILD-Scleroderma-interstitial lung disease; Skin ultrasound; Computed tomography; Scoring methods.

lease of cytokines by various immune cells, including macrophages, T- cells and platelets at the site of vascular injury. This in turn, stimulates fibroblast production of extracellular matrix.¹ Almost all patients have cutaneous involvement. Based on the extent of skin involvement, Systemic sclerosis has been subdivided into diffuse cutaneous scleroderma, limited cutaneous scleroderma and systemic sclerosis sine Scleroderma.² Upto 80% of the patients have limited cutaneous sclerosis with skin changes confined to face and extremities. The degree of cutaneous involvement is an important prognostic factor in these patients, as it predicts mortality.³ Rodnan skin score.⁴ (introduced by Rodnan in 1979) or a modified Rodnan skin score is the established method to assess skin thickness in these patients. Despite its simplicity and usefulness, the Rodnan skin score has its drawbacks. High resolution Ultrasonography (USG) is a more reliable and sensitive method for measuring skin thickness. It shows thickening of the so-called uninvolved skin, suggesting that palpation underestimates the skin fibrosis. A seventeen – site skin ultrasound has been found to be a reliable measure of skin thickness in SSc patients.⁵ Pulmonary involvement is common in patients with Scleroderma. Currently, ILD is the leading causes of death and accounts for about 60 % of SSc-related deaths. Most patients have a gradual deterioration in pulmonary function while some have a rapidly progressive course. The greatest decline in pulmonary function occurs within the first four years of disease and moderate or severe restrictive lung disease is detectable in approximately 40 % of these patients. High resolution computed tomography (HRCT) is currently the 'gold standard' for non – invasive diagnosis of ILD.⁶ In this study, we investigated the relationship between seventeen site sonologic skin thickness and total HRCT score for ILD to find if sonologic skin thick-

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INTRODUCTION

Scleroderma, also known as Systemic Sclerosis (SSc), is an autoimmune disease of small vessels and connective tissue, which is characterised by diffuse fibrosis of skin and internal organs; most frequently the lungs and gastro-intestinal tract. SSc typically occurs in 3rd to 5th decade of life and has a 3:1 female predilection. The fibrosis occurs due to the re-

ness allows prediction of the severity of ILD in SSc - ILD patients. The ability to predict the severity of ILD by sonologic skin thickness will help in avoiding CT scans and thus reduce patients exposure to radiation.

MATERIAL AND METHODS

Our study included 30 consecutive patients (26 females and 4 males) of Scleroderma related interstitial lung disease (SSc-ILD) who presented to the Department of Dermatology of SKIMS, Medical College, Srinagar from March 2011 to July 2014. The diagnosis of Scleroderma was made according to the American College of Rheumatology criteria.⁷ Patients were considered to have limited SSc if their skin thickness was confined to areas of extremities below the elbows and knees and above the clavicles. Patients were considered to have diffuse SSc if their skin thickness involved proximal extremities and /or torso. The diagnosis of ILD was made on basis of HRCT scan of the lungs. The HRCT scan eligibility was determined by the presence of ground glass opacities and / or reticular intralobular thickening with or without bronchiolectasis, traction bronchiectasis and honey-combing. Informed consent was obtained from all the patients. The study was approved by the institute ethical committee. A detailed history was obtained in all the patients. Patient's age, sex and duration of disease were documented. The duration of disease was defined as the time from the outset of first non-Raynaud's phenomenon manifestation. History of smoking (defined as current smoker or ex-smoker with greater than 10 pack-years), dry cough and exertional dyspnea were recorded. Detailed general and systematic examination was done and modified Rodnan skin score was assessed. Besides routine baseline investigations, levels of anti-nuclear antibodies (ANA), anti-centromere antibodies (ACA) and anti-topoisomerase I antibodies (Anti-Scl-70) were done. High resolution computed tomography (HRCT) of the lungs was performed in all the patients on 128-slice spiral CT scanner (Siemens Somatom Definition AS), in full inspiration in supine position. A bone reconstruction algorithm with lung window was used. No intravenous contrast was administered. Prone scans were performed to exclude gravity dependent perfusion, whenever required. All the HRCT examinations were studied by an experienced Radiologist. The following HRCT scan findings were recorded: ground glass opacities, irregular pleural margin, septal or subpleural lines, honey combing, subpleural cyst, intralobular thickening, bronchiolectasis and traction bronchiectasis. A semi-quantitative scoring system proposed by Warrick et al.,⁸ was used to assess the severity and extent of ILD. The index includes a 'severity score' ranging from 0 (normal) to 15 (all lesions present) and an 'extension score' ranging from 0 (normal) to 15 (more than nine pulmonary segments involved). The grading of abnormalities of 'severity score' is: ground glass opacities (1), irregular pleural margin (2), septal or subpleural lines (3), honey combing (4) and sub-

pleural cyst (5). The grading of 'extension score' for each abnormality is: 1 to 3 bronchopulmonary segments involved (1), 4 to 9 segments involved (2) and more than 9 segments involved (3). A total HRCT score was obtained by summing the 'severity' and 'extension' scores. Pulmonary function tests (PFT) were performed within one month of the HRCT scan in all the patients using standardized methods. Total lung capacity (TLC), forced vital capacity (FVC) and forced expiratory volume in 1-sec to forced vital capacity ratio were recorded and expressed as percentage of predicted normal. Predicted normals were obtained from published standards.⁹ High resolution ultrasonography (USG) of the skin was done by another trained Radiologist who was unaware of the results of other investigations. A Philips IU-22 ultrasound machine fitted with a 20 MHz linear transducer was used. All USG examinations were done, within one week of the HRCT scan of the lungs, before noon to avoid diurnal variation in skin edema. The transducer was placed perpendicular to the skin surface using moderate thickness of ultrasonic gel so as to separate the epidermal echo from probe echo on the image. An electronic calliper was used to measure the 'full skin' thickness by identifying surface-skin and skin-subcutis interfaces on two-dimensional B-mode image. Skin thickness was measured at seventeen sites corresponding to those of the modified Rodnan skin score. The seventeen sites examined were: dorsum of middle phalanx of middle finger (2 sites); dorsum of hand (2 sites); anterior aspect of middle portion of upper arm (2 sites); centre of forehead (1 site); anterior chest between sternal angle and sternal notch (1 site); anterior aspect of mid abdomen (1 site); anterior aspect of mid-thigh (2 sites); antero-lateral aspect of middle portion of lower leg (2 sites) and dorsum of foot (2 sites). The total sonologic skin thickness was obtained by summing the thickness of all the seventeen sites in each patient.

Statistical analyses

Statistical analyses was performed using SPSS software package, version 16. Continuous variables are expressed as mean \pm SD. Categorical variables are represented as counts and percentages. Spearman's correlation coefficient was used for correlation between total sonologic skin thickness and total HRCT score for ILD. P-values above 0.05 were considered statistically insignificant.

RESULTS

We studied 30 consecutive patients (aged 29.4 to 49 years) of SSc-ILD. The clinical and demographic characteristics of the patients are given in Table 1. Twenty six (86.7%) patients were female. Eighteen (60%) patients had diffuse SSc and remaining 12 (40%) patients had limited SSc. Exertional dyspnea was present in 23 (76.7%) patients and dry cough was present in 19 (63.3%) patients. The mean duration of disease was 5.8 ± 2.2 years. Three patients were smokers; the mean duration of smoking was 6.2 ± 4 years. The mean per-

AverageAge (years)+/- mean	AverageAge (years)+/- mean
Number of female patients (%)	Number of female patients (%)
Average Disease duration (years)+/- SD	Average Disease duration (years)+/- SD
Number of patients having Exertional dyspnea (%)	Number of patients having Exertional dyspnea (%)
Number of patients having Dry cough(%)	Number of patients having Dry cough(%)
Smoking history	Smoking history
Antibody positivity	
Number of patients having ANA	24 (80%)
Number of patients having ACA	8(26.7%)
Number of patients having Anti- Scl-70	9(30%)
Pulmonary function tests	
Average FVC (%) predicted +/- SD	68.6+/- 12.9
Average TLC (%) predicted +/- SD	70.4+/- 11.9
Average FEV ₁ / FVC ratio +/- SD	82.5+/-7.5
mRST score(range 0-51)+/- SD	mRST score(range 0-51)+/- SD
Seventeen site sonologic skin thickness (mm)+/- SD	Seventeen site sonologic skin thickness (mm)+/- SD
Total HRCT score range (0-30)	Total HRCT score range (0-30)
Table-1: Clinical and demographic characteristics of the patients with SSc-ILD.(n=30)	

centage of predicted values of forced vital capacity was less in patients with diffuse SSc than in limited SSc (69.5±16.8 vs 67.8±15.4; p= NS). Mean percentage of predicted values of forced expiratory volume in 1-s to forced vital capacity(FEV₁/ FVC ratio) was less in patients with limited SSc compared to diffuse SSc (80.8±6.5 vs 84.3±7.5; p= NS).

Ground glass opacities were the most frequent HRCT scan findings of lungs seen in 28 (93.3 %) patients followed by reticular intralobular thickening seen in 26 (86.7%) patients. Honey combing was seen in 11 (36.6%) patients and pleural thickening in 2 (6.7 %) patients. All HRCT scan abnormalities were most common in lower lobes without right or left predominance. The total HRCT score for ILD was 25+/- 4. Fig I and 2 show the HRCT scan of lungs in a patients with SSc- ILD.

High resolution USG of the seventeen anatomical sites showed a considerable overlap in skin thickness.

Fig. 3 shows high resolution USG image of skin over dorsum of hand for measuring skin thickness. Patients with diffuse SSc showed thicker skin on hands, forearms, legs and chest than did patients with limited SSc; however, the differences did not reach statistically significant values. Also, there was a considerable overlap in the USG skin thickness in patients with different mRS score. The sum seventeen site sonologic skin thickness was 26.41+/- 4.27 mm

DISCUSSION

Scleroderma is an auto-immune disease characterised by diffuse fibrosis of skin and internal organs. The degree of cutaneous involvement is an important prognostic factor in these patients as it predicts mortality.³ High resolution USG is a sensitive method for measuring skin thickness in these patients, as it shows thickening of so called uninvolved skin also. A seventeen site skin ultrasound has been found to be reliable in measuring skin thickness in SSc patients.⁵ Pulmonary involvement is common and interstitial lung disease



Figure-1: HRCT image of lung showing interlobular septal thickening and bronchiolectasis

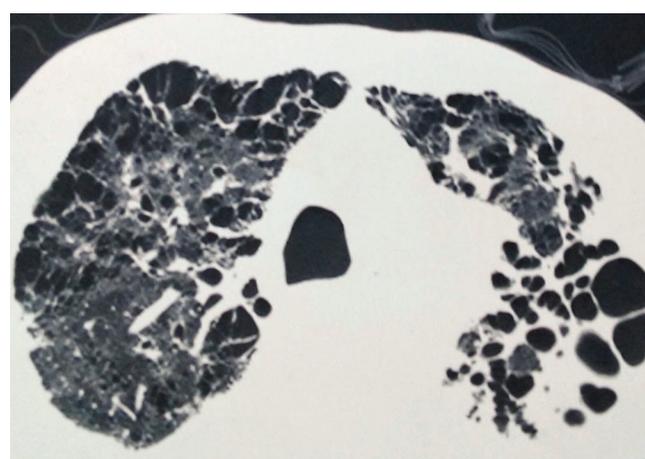


Figure-2: HRCT image of lung showing honeycombing and bronhiectasis

(ILD), occurs in approximately 80 % of these patients. HRCT is currently, the gold standard for non invasive diagnosis of ILD.¹² The HRCT features of SSc –ILD are similar to those of non specific interstitial pneumonia(NSIP). As the disease

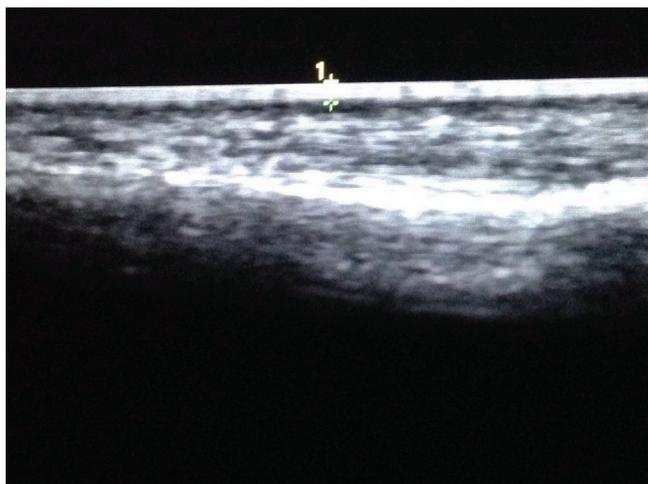


Figure-3: High resolution sonography of skin over dorsum of hand for measuring skin thickness 1 + +: thickness of skin of dorsum of hand

progresses, ground glass opacities get replaced with reticular intralobular thickening, bronchiolectasis, traction bronchiectasis and honey-combing. These findings of ILD by HRCT have been found in 91% of patients with Scleroderma.¹³ Various HRCT scoring methods have been developed to quantify SSc-ILD.¹⁴ Although, ILD represents a major complication of Scleroderma, pulmonary involvement is commonly silent, whereas the skin fibrosis is the usual clinical feature drawing patient's attention. Hence the study was undertaken to determine whether seventeen site sonologic skin thickness could predict the severity of ILD in SSc-ILD patients.

Conclusion: The present study failed to establish any definite correlation between the two. This can be explained by the fact that the skin thickness usually reaches a peak in the first three years due to skin edema that occurs early in the course of disease. However, when the early edematous phase is replaced by the indurative phase in which the skin thickness decreases. On the other hand, ILD worsens over time but shows a quite variable course

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Solitary Infantile Myofibromatosis at Distal end of Humerus: A Rare Case Report

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ABSTRACT

Introduction: Infantile myofibromatosis is a rare benign disorder of mesenchymal origin presenting as tumors in skin, muscles, bones and soft tissue of head and neck. Its solitary occurrence in bones is very rare. It is even rarer in peripheral location of skeletal system.

Case report: Herein we report a case of infantile myofibromatosis at distal end of humerus confirmed by histopathological examination. Patient was successfully treated with curettage and filling of cavity by bone substitute (beta tricalcium phosphate).

Conclusion: Infantile myofibromatosis is a rare event. Despite of its rarity a high index of suspicion must be practiced to arrive at correct diagnosis and treatment.

Keywords: Solitary, Infantile myofibromatosis, bones, beta tricalcium phosphate.

other clinical examination was found to be insignificant, the patient was not sent for further X-rays in lieu of radiation exposure and was kept on regular follow up. The prognosis was explained to the child's parents who concurred with our approach to his treatment.

The patient was admitted and the basic investigations done. On the 5th day after admission, the patient was taken into surgery and was managed by open biopsy, curettage and chronose granules (beta tricalcium phosphate) application [Figure 2]. Above elbow plaster of paris slab was applied for 4 weeks. After 4 weeks active elbow range of motion physiotherapy was started. Patient regained full range of movements at elbow joint at the end of 6 months and x ray of elbow showed healed lesion [Figure 3]. Patient was followed for 18 months and there was no evidence of recurrence or any other complication. The biopsy sample was sent for histopathological examination and the reports confirmed it to be infantile fibromatosis.

DISCUSSION

IM is the most common fibrous tumor in early childhood, even though its overall incidence is low.⁶ About 90% of these are found in patients less than 2 years of age and is rare in children and adults.⁶ It is divided into two types: single solitary lesions as noticed in our case and multicentric type. The multicentric variant is further sub-divided into two types depending on whether there was any visceral involvement involving lungs, gastrointestinal tract (liver and pancreas) and kidneys.

Chung and Enzinger⁷ and Muraoka⁸ et al found the solitary lesion to be the most common mode of presentation (50-75%) that generally affects the skin, muscle, bone and subcutaneous tissue in the head, neck and trunk. The nodules are well-circumscribed, painless, firm and associated with

INTRODUCTION

Infantile myofibromatosis (IM), first described by Stout¹ in 1954, is characterized by benign myofibroblastic tumors in the soft tissues, the bones, and, occasionally, the viscera. The disorder can primarily be separated into two types although some texts classify it into three or four types as well.²⁻⁵ The most commonly documented is the solitary form with a nodule in the skin, bone or viscera and the other is the multicentric type. Solitary skeletal lesions are relatively uncommon but when present, they occur more frequently in the craniofacial skeleton. The bones most commonly involved are skull, femur, tibia, spine or ribs.

CASE REPORT

We report the case of a three year old male child who presented with chief complains of stiffness and a painless swelling of size 2x2 cm over the posterior aspect of the right elbow along with stiffness. The swelling had been present for six weeks and was non tender and firm in consistency. No lymphadenopathy or visceromegaly was noted. The child had no other significant medical history. Patient's family history was found to be insignificant.

An X-ray of the right elbow revealed a radiolucent, expansile lytic lesion over the medial epicondyle surrounded by dense sclerosis in the distal end of the humerus [Figure 1]. Since all

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Figure-1: X ray of elbow showing a radiolucent, expansile lytic lesion in the medial epicondyle of humerus surrounded by dense sclerosis.



Figure-2: Post operative X ray of elbow showing post curettage cavity filled with bone substitute.

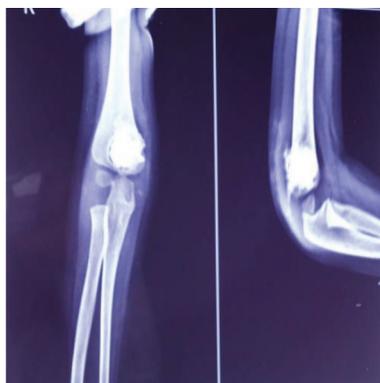


Figure-3: Six months follow up X ray of elbow showing healed lesion with incorporated bone substitute material.

an initial phase of rapid growth.⁹ They are more commonly found in males

Besides the routine blood investigation, the suspicion of infantile myofibromatosis warrants the following investigations in all cases: x-rays of the long bones and skull, chest CT, abdominal and pelvic ultrasound and echogram. These investigations don't confirm the diagnosis but are a play a significant role in ascertaining the extent, progression and the chance of recurrence of the disease. The diagnosis is confirmed by biopsy as in our case. On histopathological examination, it is found to have ovoid to spindle-shaped collagen-forming cells showing immunohistochemical and

electronic characteristics intermediate between fibroblasts and smooth muscle cells.

The patients with solitary lesions are usually treated conservatively unless it causes symptoms as it had in our patient. In such cases, an operative intervention can be planned as was done for our patient by open biopsy, curettage of the lesion and chondrose granules application to fill the defect. If managed conservatively, regular follow ups are essential to monitor the progression. The multicentric variant has a poorer prognosis with the mortality of over 70% in patients with visceral involvement.

Treatment for the solitary form is expectant with clinical and imaging follow-up due to the possibility of spontaneous regression. The multicentric form requires a surgical approach. Surgical treatment is also considered appropriate when the tumor causes clinical compromise as happened with our patient who had respiratory failure due to tumor growth in the upper airway. The generalized variant of IM has a poor prognosis and use of CT may be considered. After conservative treatment (periodic evaluation to determine spontaneous regression) or surgical treatment, follow-up of these patients must be done because of the possibility of recurrence. This usually is ~5% for the solitary form. There is also the possibility of recurrence in the case of incomplete and inappropriate curettage or even after excision. Prognosis depends on mode of presentation. It is usually benign with spontaneous regression during a total period of 1-2 years for the solitary variant and also for the multifocal variant without visceral involvement. The multicentric form with GI, cardiac or pulmonary compromise may have a mortality rate of up to 73%.¹⁴

CONCLUSION

Infantile myofibromatosis is a rare myofibroblastic tumor usually seen in axial skeletal. Its solitary presentation in bone is even more rarer. Though rare it nevertheless warrants greater emphasis than it receives in literature. High index of suspicion should be practiced for correct diagnosis and treatment.

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MPDS- Multifactorial Etiology and Varied Pathophysiology: A Review

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ABSTRACT

Temporomandibular joint (TMJ) diseases and disorders refer to a complex and poorly understood set of conditions, manifested by pain in the area of the jaw and associated muscles. Myofascial pain syndrome is a chronic pain disorder which produces the pain by pressure on sensitive points in muscles (trigger points) and causes pain in seemingly unrelated parts of body.

This article highlights the possible etiology, clinical features, investigations and recent treatment of myofascial pain dysfunction syndrome.

Keywords: Myofascial pain, temporomandibular joints, trigger points

INTRODUCTION

Myofascial pain is a regional myogenous pain condition characterized by local areas of firm, hypersensitive bands of muscle tissue known as trigger points. This condition is also referred as myofascial trigger point pain. Myofascial trigger point pain was first described by Travell and Rinzler in 1952.¹

A myofascial trigger point (MTrP) is clinically defined as a hyperirritable spot in skeletal muscle that is associated with a hypersensitive palpable nodule in a taut band. The spot is painful on compression and can give rise to characteristic referred pain, referred tenderness, motor dysfunction, and autonomic phenomena.²

In 1969 Laskin published a paper and stated that there are many patients with muscle pain complaints in which the cause is not the occlusal condition and described the importance of emotional stress and other factors. After this article dental professionals began using the term myofascial pain dysfunction syndrome.¹

Historical Aspect of Myofascial Pain Syndrome

Myofascial trigger points (MTrPs) are the principal characteristic of MPS. During the past nearly 200 years, numerous authors have described MTrPs in the English, German, Dutch, and French medical literature, illustrating that musculoskeletal pain due to MTrPs is very common.^{3,4} Already in 1816, British physician Balfour described MTrPs as “nodular tumours and thickenings which were painful to the touch, and from which pains shot to neighbouring parts.”⁵ In 1938, British rheumatologist Kellgren published a seminal paper

describing specific referred pain patterns of many muscles and spinal ligaments following injections of hypertonic saline. In 1952, Travell wrote the first of many articles introducing the myofascial genesis of pain illustrated by specific referred pain patterns of over 30 muscles.⁶ Travell (1901 - 1997) has been referred to as the pioneer in the treatment of musculoskeletal pain through the recognition of MTrPs. She coined the term “myofascial pain syndrome” to describe pain as a result of trigger points in muscle, tendon, skin, fascia, and ligaments (the term “trigger point” was introduced by Steindler in 1940).⁷

CAUSE

Central nervous system plays significant role. Combination of both central and peripheral factors makes the condition difficult to manage. The following conditions are clinically related to myofascial pain:

Protracted local muscle soreness

Muscles that experience continued muscle soreness may lead to development of myofascial trigger points and myofascial pain.

Local factors

Certain local factors that influence muscle activity such as habits, poor posture and chilling seem to affect myofascial pain.

Systemic factors

Certain systemic factors may precipitate to myofascial pain e.g. fatigue, poor physical condition, hypovitaminosis and viral infections

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Increased emotional stress

Myofascial pain may be exacerbated by increased emotional stress. When individual is experiencing higher levels of emotional states, such as fear, anxiety frustration or anger the following major modifications of muscle activity can occur:

- An increased emotional stress excites the limbic structure and hypothalamus activating the gamma efferent system. Increased gamma efferent activity comes contraction of the intrafusal fibres, resulting in partial stretching of muscle spindle. When spindles are partially stretched, less stretching of the overall muscle is needed to elicit a reflex action. This affects the myotactic reflex and ultimately results in increase in muscle tonus. Muscles also become more sensitive to external stimuli which leads to further increases in muscle tonicity. These conditions lead to an increase in intra-articular pressure of TMJ.
- The increased gamma efferent activity may also increase the amount of irrelevant muscle activity. The reticular formation, with influence from the limbic system and hypothalamus can create additional muscle activity unrelated to the accomplishment of specific task. Often these activities assume the role of nervous habits such as biting on the finger nails or on pencil, clenching the teeth together or bruxism.

Constant deep pain

Constant deep pain input can create central excitatory effects in remote sites. If central excitatory effect involves an efferent (motor) neuron, two types of muscle effects can be observed:

- Protective co-contraction.
- Development of trigger point.

When trigger point develops it becomes a source of deep pain and can produce additional central excitatory effects. These secondary trigger points are called satellite trigger point.¹

CLINICAL FEATURES

1. Females more affected than males with ratio of 4:1.
2. Affects primarily young women (age 20 to 40 years).
3. Presence of trigger points which present as local areas of firm, hypersensitive, bands of muscle tissue.
4. There are four cardinal sign and symptoms:
 - Pain
 - Muscle tenderness.
 - Clicking or popping noise in TMJ.
 - Limitation of jaw movement.^{8,9}

PAIN

Most common sites of pain in the masticatory system include jaw pain, preauricular pain, ear ache, neck pain, facial pain, and temple, frontal or occipital headaches.

- Pain has following characteristic:

- Pain is usually of dull and deep quality.
- The pain diffuse in nature
- The incidence and severity of pain vary with the stimulus.
- Associated restriction in movement may be present.

Although pain is increased with function of involved muscle, the amount of pain reported usually less than with local muscle soreness.^{10,11}

MUSCLE TENDERNESS

In myofascial pain, the tenderness termed trigger points is deep localized and about 2-5 mm in diameter. In many instances, the patient may be aware only of referred pain and not even acknowledge the trigger point. Referred pain is wholly dependent on its original source, palpation of an active trigger point increase such pain.⁹

Trigger point may present in an active or latent state. In active state it produces central excitatory effects. Therefore when trigger point is active a tension type headache is commonly felt. In latent state patient does not report headache complaint. In this state trigger point is no longer sensitive to palpation and therefore does not produce referred pain. These types of trigger points are difficult to find by palpation.¹

CLICKING NOISE

There will be recurrent clicking in temporomandibular joint at any point of jaw movement and there may be crepitus especially with lateral movements.¹²

LIMITATION OF JAW MOVEMENT

There may be limitations of jaw movement with variable jaw deviation or locking but rarely severe trismus is seen. Patient who clench or grind their teeth during working hours, the symptoms tend to worsen toward evening and some times have psychogenic basis. People with night time habit of clenching or grinding the teeth may awake with joint pain that abates during the day.¹²

Sometimes myofascial pain of head and neck is misdiagnosed due to additional signs and symptoms which are occasionally reported with more severe cases and coincidental pathologic conditions and are often associated with myofascial trigger point. Additional symptoms are increased fatigability, stiffness, subjective weakness, numbness, hyperesthesia, teeth sensitivity, excess lacrimation, increase salivation, nausea and vomiting. Numerous otologic symptoms such as ear pain, tinnitus, diminished hearing, dizziness, vertigo and fullness in ear.¹³

INVESTIGATIONS

Diagnosis is made on the basis of clinical findings.

Muscle spasm	Trigeminal neuralgia	Atypical odontalgia	Pulpal pain
<ul style="list-style-type: none"> Characterised by acute onset of pain in jaw, face, ear or temples. In muscle spasm there is generalised tenderness of muscle 	<ul style="list-style-type: none"> In TGN there is paroxysmal, unilateral sharp pain, sudden electrical lancinating pain confined to distribution of one or more branches of trigeminal nerve. TGN occur after four decade and peak in 5th and 6th decades. Trigger zones are present and stimulated by touch, in MPDS trigger points are deep, localised and 2-5 mm in diameter and produce pain on palpation. Trismus absent in TGN 	<ul style="list-style-type: none"> There is pain in tooth or tooth side. Mandibular function does not affect. Patient will not have trigger points. 	<ul style="list-style-type: none"> Sharp oscillating, throbbing tends to coarsen or improve in time and local provocation of tooth exacerbates pain. Trigger point are absent. Clinical or radiographic science of pathology present in tooth with pulpal pain and absent in MPDS.

Table-1: Differential diagnosis

Radiographic changes are not commonly present. Arthrography and MRI is seldom indicated.¹²

PRESENCE OF TRIGGER POINTS

Trigger points are localized, firm, hyperirritable nodules that are tender to palpation patients often describe as knots within their muscles if sufficiently sensitized can be the referred pain source. Trigger points are small in head and neck region i.e. about to 2 to 10 mm and larger in shoulder region 10 to 20 mm. Trigger points become aggravated from muscle use, poor sleep, psychological tension and emotional stress and their severity can fluctuate as the contributing factor change. Manual palpation is a common method for identification of trigger zones. Rolling the finger over the muscle and feeling for firm, hyperirritable nodules within the muscle often identifies the trigger zone. It has been demonstrated to apply pressure directly to the trigger point to generate the referred pain.¹⁴

EXAMINATION OF MUSCLE OF MASTICATION

Muscles should be examined for tenderness using digital palpation. Muscles that should be included in examination are medial and lateral pterygoid, masseter, temporalis, sternocleidomastoid, and trapezius. Medial pterygoid muscles are checked by running a finger in an anterioposterior direction along the medial aspect of the mandible in the floor of the mouth.

Masseter muscle is examined by simultaneous pressing from inside and outside the mouth in the process of bimanual palpation. Lateral pterygoid examined by inserting a finger behind tuberosity region. In temporalis each of three areas (anterior, middle, posterior) should be examined. The anterior region is palpated above zygomatic arch and anterior to TMJ. The middle region is palpated directly above the TMJ

and superior to zygomatic arch. Posterior region is palpated above and behind the ear. In sternocleidomastoid palpation is done bilaterally near its insertion on the outer surface of mastoid fossa behind the ear. The entire length of muscle is palpated down to its origin near the clavicle.^{1,15}

MEASUREMENT OF STRESS

A useful tool is Symptom check list 90(SCL-90). This evaluation provides an assessment of nine psychologic states:

1. Somatisation
2. Obsessive compulsive behaviour
3. Interpersonal sensitivity.
4. Depression.
5. Anxiety.
6. Hostility
7. Phobic anxiety.
8. Paranoid ideation.
9. Psychotocism.

Assessment of these factors are necessary when evaluating chronic pain.¹⁶

TREATMENT

Treatment of MPDS is divided in to three categories by Weinberg. These categories are:

1. Palliative therapy.
 2. Causative therapy.
 3. Adjunctive therapy.
- One more category has been suggested by authors known as:
4. Definitive therapy.

PALLIATIVE THERAPY

This therapy includes procedures such as occlusal splint,

medications, home remedies (ice, moist heat application, exercises and soft diet).

MOIST HEAT AND ICE

Moist heat opens the capillary bed to promote increased blood flow; it also acts as muscle conditioner prior to exercise and physical therapy. Contraindications of heat therapy include circulatory insufficiency, sensory or cognitive impairment, malignancy and inflammation. Application of ice is quite effective for reducing muscle swelling and pain especially in acute condition.¹⁷

OCCLUSAL SPLINTS

Dental occlusal splinting and permanent occlusal adjustment have been the mainstays of TMJ disorder treatment. Occlusal splint therapy may be defined as “the art and science of establishing neuromuscular harmony in the masticatory system by creating a mechanical disadvantage for parafunctional forces

with removable appliances.” Occlusal splint is a diagnostic, relaxing, repositioning, and reversible device. According to the glossary of prosthodontic terms [8th ed.], “occlusal splint is defined as any removable artificial occlusal surface used for diagnosis or therapy affecting the relationship of the mandible to the maxilla. It may be used for occlusal stabilization, for treatment of temporomandibular disorders, or to prevent wear of the dentition.” A common goal of occlusal splint treatment is to protect the TMJ discs from dysfunctional forces that may lead to perforations or permanent displacements. Other goals of treatment are to improve jaw-muscle function and to relieve associated pain by creating a stable balanced occlusion. Splint therapy is considered an adjunct to pharmacologic therapy and most appropriate when nocturnal parafunctional activities can be identified. Typically, a flat-plane maxillary occlusal splint designed for bilateral contact of all teeth is fabricated. Such splints are thought to unload the joint by disarticulating the dentition and increasing the vertical dimension of occlusion. By unloading the joint, there will be a reduction in both synovitis and masticatory muscle activity. Therefore, the result is a reduction in symptoms. These appliances may also change condylar position and the existing occlusal relationship, thereby reducing abnormal muscle activity and spasm. Most occlusal splints have one primary function that is to alter an occlusion so they do not interfere with complete seating of the condyles in centric relation.¹⁸

PHARMACOTHERAPY

Drug therapy should be used on fixed dose schedule rather than as needed for pain. Following drugs can be used for treatment of M.P.D.S.

MUSCLE RELAXANTS

Most common muscle relaxants are metaxalone 400 to 800 mg every six hours or chlorzoxazone 500 mg every six hours. Other muscle relaxants are casrisoprodol, methocarbamol, orphenadrine and cyclobenzaprine.

NONSTEROIDAL ANTI-INFLAMMATORY DRUGS

NSAIDs are commonly used for the pain control in cases of MPDS. Ibuprofen should be used in doses of 400mg four times daily. Chronic long term use is cautioned against because of their systemic and gastrointestinal side effects. The cyclo-oxygenase inhibitors rofecoxib (25-50 mg/day) and celecoxib (100-200mg/day) has same analgesic effects with reduced risk of gastrointestinal injury.

BENZODIAZEPENES

Diazepam (5-10 mg/day) and clonazepam can be used in the patient with muscle pain accompanied by stress and sleep disturbances.

TRICYCLIC ANTIDEPRESSANT

Drug like amitriptyline is effective in management of chronic pain in cases of MPDS. It has analgesic action in low doses, sedative effects and promotes restful sleep. The analgesic effect of TCAs is due to the serotonin and noradrenaline reuptake inhibition at synaptic level in the central nervous system (CNS). The blocking of these two amines increases their concentration and availability in the synaptic space of the nerve endings in the posterior horn of the spinal cord (involved in the transmission of pain) favoring or prolonging the inhibitory action in the transmission of pain. It can be started with dose as low as 10mg at night and dosage can be increased to 75 to 100mg depending upon patient tolerance.^{9,10}

CAPSAICIN

Capsaicin cream (0.025% or 0.075%) can be use for pain relief. It releases substance -P and pain related neuropeptides to reduce pain perception and inflammation and must be applied multiple times per day for at least 2 weeks. Side effects of the drug are local burning, warming and reddening of the skin, these side effects diminish with time and eventually disappear.¹⁷

EXERCISE

Passive stretching i.e. keeping the muscle fibers relaxed while slowly stretching the muscle, preventing it from tightening via the stretch reflex in conjunction with moist

heat (followed by application of ice) is beneficial for decreasing muscle and joint pain and for improving ranges of movement.¹⁹

COUNTER STIMULATION OF MUSCLE

There are two methods for reducing muscular pain:

1. Repetitive action on trigger point with a mode of counter stimulation.
2. Muscle rehabilitation through active and passive stretching and postural exercises to restore the muscle to normal length, posture and range of motion.

There are several methods for counter stimulation of muscle to reduce trigger points. Common methods are spray and stretch, trigger point injection and acupuncture. Other methods like ultrasound, direct electrical stimulation are also useful for muscle contracture.

SPRAY AND STRETCH

Non-invasive technique for counter stimulation. It involves cooling the skin with fluoromethane, ethyl chloride, spray and then gently stretching the involve muscle to perform spray and stretch therapy. The cooling is done to allow the stretching to take place without the pain leading to reactive contraction or strain. The vapocoolant spray provides abrupt cutaneous stimulation that temporarily reduces pain perception in the area. It must be applied from distance of 18 inch. It is applied in one direction from trigger points towards reference zone in slow, even sweeps over adjacent parallel areas at rate of about 10cm/second.^{13,16}

PRESSURE AND MASSAGE

Increased pressure is applied to trigger point can also relieve pain. Pressure is increased to about 20 pounds and is maintained to 30 to 60 seconds. If this technique produce pain it must be stopped since the pain can reinforce cyclic muscle pain.¹⁶

TRIGGER POINT INJECTIONS

Intramuscular trigger point injection can be performed by injecting local anaesthetic solution, saline or sterile water or by dry needling without depositing a drug or solution.

Procaine diluted to 0.5% with saline has been recommended because of its low toxicity to the muscle, but lidocaine (2% without vasoconstrictor) is also used with standard dental syringe. Injections are often given to muscle group in series of weekly treatments for 3 to 5 weeks; this may be continued with modification of the intervals between injections, depending upon the response.

Trigger point injections with LA are generally more comfortable than dry needling or injecting other substances, although acupuncture may be helpful for patient with multi-

ple chronic muscle trigger points. The LA must be used in concentration less than that required for nerve block. This can remarkably lengthen the refractory period of peripheral nerves and limit the maximum frequency of impulse conduction.^{9,13}

ADJUNCTIVE THERAPY

Consist of treatment modalities that augment and assist definitive or causative type of treatment for TMD.

PHYSIOTHERAPY

It is combination of physical therapy, massage therapy and electro modalities. Both passive and active treatments are commonly included as part of therapy. Posture therapy is also useful to avoid forward head positions that are thought to adversely affect mandibular posture and masticatory muscle.^{9,17}

ELECTROTHERAPY

Is a part of adjunctive therapy; modalities includes electrogalvanic stimulation, ultrasound, low level laser and infrared.

ELECTROGALVANIC STIMULATION

It utilizes negative polarity over a painful, swollen area. The negative charge produces alkaline effect within the tissues, denaturing proteins and produced vasodilatation of the capillaries; this in turn permits the outward flow of metabolites and tissue fluids. High voltage electrogalvanic stimulation rhythmically pulsates the muscles to the level of fatigue causing muscle relaxation.¹⁷

TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION (TENS)

Mode of action of transcutaneous electrical nerve stimulation (TENS) has been attributed to neurologic, physiologic, pharmacologic and psychological effects. TENS supposedly blocks pain signals being carried over the small, unmyelinated C fibers by forcing the large myelinated A fibers to carry a light touch sensation. It may provide pain relief by physiologic effects of rhythmic muscle movement. The fasciculation of muscle may result in an increase in circulation, a decrease in edema and a decrease in resting muscle activity. The pharmacologic action of TENS may involve the stimulated release of endorphins which are endogenous morphine like substances. The probable placebo effect of TENS in relieving pain should also be considered. It is thought to increase the action of the modulation that occurs in pain processing at the dorsal horn of the spinal cord and trigeminal nucleus of brainstem.¹⁵

ULTRASOUND

It is a method of producing deep heat more effectively than the patient could achieve by using surface warming. These mechanical vibrations produce heat and vasodilatation by increasing the tissue temperature. Thus increasing metabolic activity. Vibrations also decrease pain by activating large myelinated peripheral neurons that attenuate pain or nociception stimulation at spinal cord or trigeminal (pons) levels.^{9,17}

IONTOPHORESIS

Is a process in which ions in solutions are driven through intact skin by using a direct current between two electrodes. It uses ultrasonic energy to drive a medication deep into the tissue.

Low level laser

Laser therapy includes nitric oxide synthesis, which causes the endothelial linings of capillaries to dilate, improving circulation in the area. Laser therapy also may return injured tissues to a more optimum energy level, improving circulation, decreasing pain and swelling.

Infra red radiation

It produces vasodilatation of capillary bed by initiating the synthesis of nitric oxide, improving circulation and decreasing swelling. This small neurotransmitter improves circulation by opening the endothelial linings of capillaries.^{13,17}

Acupuncture (dry needling) and Percutaneous electrical nerve stimulation (electro-acupuncture or PENS)

The effect of electro acupuncture is achieved by stimulation and release of endogenous analgesic peptides. The use of electro acupuncture or PENS with needling of trigger points in these cases will not only implement the local needle effect to reduce pain but also restore normal muscle analgesic system to provide more generalised effect of analgesia.

Local point therapy includes needling points to inactivate them. Distal point therapy includes needling points on opposite end of involved meridians with low frequency (1 to 5 hertz) electrical stimulation to stimulate endogenous opiate system.¹³

MANAGEMENT OF STRESS

Integrating behavioural therapy and relaxation techniques in chronic pain management in MPDS are effective. Relaxation techniques decrease sympathetic activity and possibly arousal. Deep methods include autogenic training, meditation, and progressive muscle relaxation. Brief methods of relaxation include self – control relaxation, paced breathing and deep breathing. Hypnosis produces a state of selective or diffuse focus in order to induce relaxation.

Biofeedback is a treatment method that provides continuous

feedback, usually by monitoring the electrical activity of the muscle with surface electrodes or by monitoring peripheral temperature. The monitoring instruments provide patients with physiological information that allows them to reliably change physiological functions to produce response similar to that produced by relaxation therapies.⁹

CONCLUSION

Myofascial pain syndrome is a type of muscle pain syndrome that has a defined pathophysiology that leads to the development of characteristic taut or hard band in muscle that is tender and that refers pain to distant sites. If it becomes chronic, it tends to generalize. Myofascial pain syndrome can resolve with ideal treatment regimens. However, many patients with myofascial pain syndrome have symptoms for years. Outcomes are best when a multifaceted treatment approach is done.

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Transition of Oral Leukoplakia Into Oral Verrucous Carcinoma – A Case Report with Literature Update

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ABSTRACT

Introduction: Verrucous carcinoma (VC) is an exophytic lesion, which classically can be seen in the oral cavity, larynx, genitalia, skin, and esophagus. It has a slow growth potential and is an alternative form of oral squamous cell carcinoma. It is recognized by its local aggressiveness with minimal metastatic activity. It is also called as “snuff dipper’s cancer” as its association with tobacco chewers and snuff users. According to a recent literature, VC has a strong relation with human papilloma virus which has a potential role in its growth and development. Though clinical presentation is classic for VC, histopathological diagnosis needs expertise opinion. It is said that often VC is preceded by long standing potentially malignant disorders (PMD) in the oral cavity.

Case report: Here we report a case of verrucous carcinoma with a pre existing history of oral leukoplakia since long duration. The case was managed surgically and the patient is on follow up without any complication since a year.

Conclusion: From the case presented here we could say that potentially malignant disorders (PMD) of oral cavity should be correctly diagnosed and immediately the treatment should start to prevent further complications. Long term follow up of patients with PMD is must. The Prognosis of VC is often good after surgical treatment.

Keywords: verrucous carcinoma, potentially malignant disorders, histopathologic diagnosis, oral leukoplakia

INTRODUCTION

Cancer is the second most leading cause of mortality in economically developed countries (following heart diseases) and the third most leading cause of death in developing countries (following heart diseases and diarrhoeal diseases). VC is a rare variant of squamous cell carcinoma of oral cavity, diagnosed in only 1 to 3 of every 1,000,000 persons each year.¹ The term verrucous carcinoma was first recognized by Lauren V. Ackermann in the year 1948. By that time it’s commonly called as verrucous carcinoma of Ackermann or simply Ackermann’s tumor. History dates back in 1896 when Buschke, and next in 1925, Buschke and Loewenstein, illustrated a lesion on penis which emerged benign cytologically, but behaved like a malignancy. As it was histologically similar to the benign condyloma acuminatum, it was termed as a giant condyloma acuminatum or the Buschke-Loewenstein

tumor.² It was actually a genital form of verrucous carcinoma. Buschke-Loewenstein tumor, florid oral papillomatosis, epithelioma cuniculatum, carcinoma cuniculatum and Ackermann’s tumor are various synonyms for verrucous carcinoma in literature. Here we report a case of VC in middle aged male patient with previous history of oral leukoplakia in oral cavity.

CASE REPORT

A 43 years old male reported in our Department of Oral Medicine and Radiology with a chief complaint of white patch on his lower left posterior region of jaw since 1-1/2 years. A detailed case history revealed that the patch existed since 1-1/2 years when he had visited a private dentist for oral prophylaxis, who had alarmed him regarding the white lesion and had counseled him about its malignant potential and advised him complete stoppage of all deleterious habits. The patient continued his habits and appeared alright. Patient revisited the dentist after 1 year for oral prophylaxis. Dentist informed the patient that the white lesion had increased in size and needs to be biopsied. With the apprehension of cancer, Patient visited cancer hospital where he was advised biopsy, which he did not get done. He then visited our department of Oral Medicine and Radiology for the same. He presented with a history of pain and paresthesia on mandibular left side of jaw. Patient’s past medical and dental history were non significant. He revealed a habit of chewing tobacco mixed with lime 8-10 times per day since 15 years placed it in and used to keep in mandibular left posterior region of jaw for 10-15 minutes and spit it out afterwards, and also used to consume paan occasionally. Since 1 month he had completely stopped all the habits. Examination of area of

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chief complaint showed whitish verrucous growth in relation with 36 involving marginal and attached gingiva which was surrounded by leukoplakic patch [figure 1]. On palpation lesion was rough in consistency and non tender. 36 number tooth was grade I mobile. A single left side submandibular lymph node approximately size of 0.5x0.5 cm was found palpable which was soft, movable and non tender. Based on the clinical findings, a provisional diagnosis of Verrucous leukoplakia was made and a differential diagnosis of Verrucous carcinoma was considered. Various investigations like IOPA, cropped panoramic radiograph, CBCT, CT, blood investigations and incisional biopsy were carried out. On intraoral periapical radiograph (IOPA) severe bone loss was seen, mimicking a floating tooth appearance, but complete extent of bone loss was not appreciated on IOPA [figure 2]. In panoramic view radiolucency in alveolar crestal bone and in furcation area can be appreciated suggestive of bony invasion of lesion [Figure 3]. On CBCT, CT scan complete extent of lesion could be appreciated which was about 16.8x8.7 mm on axial CBCT [Figure 4]. On cross sectional CBCT periodontal ligament widening was noted with the adjacent premolar [Figure 5] which was not clearly noted on conventional radiograph. 3D reconstructed image by CBCT was done [Figure 6]. Incisional biopsy was done from the left buccal vestibule in region of 36 and specimen was sent for the histopath examination. The histopathological analysis in H and E section showed, epithelium with bulbous reteridges and acanthosis. There was presence of orthokeratin plugging. Individual cell keratinization and bizarre mitotic figures were seen at places. There was nuclear hyperchromatism and cellular pleomorphism which were pointing out a diagnosis towards a malignancy [Figure 7]. Histopathologic diagnosis came was Verrucous carcinoma. Patient was opted for surgery; hemimandibulectomy along with neck dissection on left side was done. Patient is still under follow up with no metastasis or recurrence.

DISCUSSION

Oral cavity and larynx are the most favored sites for verrucous carcinoma in head and neck region. It can also be found in other sites like vulva, pyriform fossa, nasal cavity, esophagus, paranasal sinuses, external auditory meatus, lacrimal duct, skin, penis, scrotum, vagina, uterine cervix, legs and perineum.³ There is a predilection for males in 6th or 7th decades of life who are addicted to the habits of tobacco, pan chewing and snuff dipping. The case presented here is also middle aged male patient with history of tobacco and pan chewing and used to place tobacco quid in mandibular left posterior vestibular region and lesion occurred on same area around the gingiva. Clinically VC appears as papillary with pebbled surface. There can be rugae like folds with deep clefts. In some cases it showed warty fungating like masses, often surrounded by premalignant lesions or conditions. Statistics reports it to be 5% of all intraoral squamous cell



Figure-1: Intraoral view of lesion; **Figure-3:** Cropped panoramic view showing radiolucency in alveolar crestal bone and in furcation area.



Figure-2: IOPA showing severe bone loss mimicking floating tooth appearance

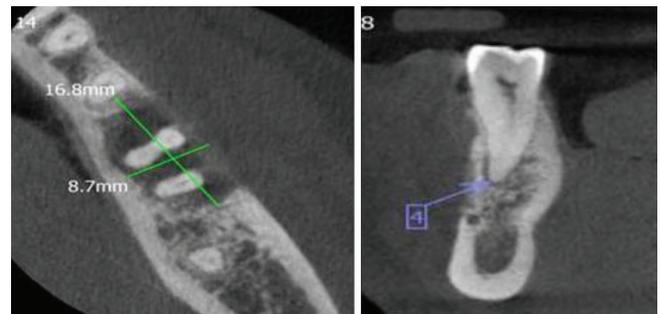


Figure-4: Axial CBCT showing extension of bone involvement; **Figure-5:** widening of periodontal ligament space with adjacent tooth

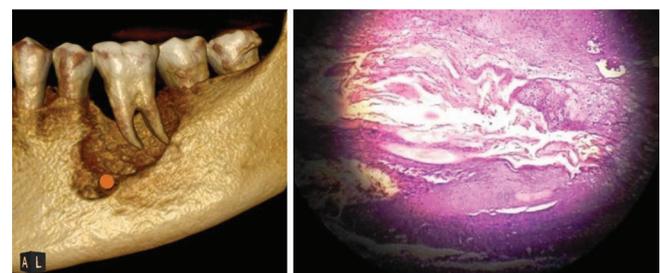


Figure-6: 3D reconstructed image; **Figure-7:** histopathology picture

carcinomas.⁴

It can occur in various anatomical locations and in oral cavity buccal mucosa, alveolar ridge and gingiva are common sites. VC can be seen in various forms like fungating, verrucoid, papillary or cauliflower like. According to a study by Rajendran et al., they found that leukoplakia was associat-

ed with VC in 48% of their cases.⁵ Demian SD et al (1973) stated that very old, untouched leukoplakia could be transformed into VC.⁶ Similar findings were proved in our case. The various treatment options in literature are surgical excision of the lesion that can be combined with radiotherapy. However there are some reports of local recurrence or anaplastic transformation after radiotherapy, but in a study by Shao Hui Huang et al (2009), they disapprove this fact too.⁷ Literature says that even though lymph nodes involvement if present in VC, they are quite often inflammatory. In our case as bone involvement was extensive and also lymph nodes were positive, conventional surgery along with neck dissection was carried out. Radiotherapy was not given. Patient is under follow up since a year and till date no complications were noted.

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CONCLUSION

From the case presented here, we could say as a dentist we come across patients with various abuse habits and white and red lesions in oral cavity. It is very important to diagnose the potentially malignant disorders (PMD) of oral cavity and to make patients aware and educate them regarding the potential threat of these potentially malignant disorders and their possible transformation into malignancy. Even after stoppage of adverse habits it is important to do a follow up with the patients with such PMDs and to perform biopsy if recommended. Though verrucous carcinoma is rare to see in routine practice, clinic pathologic correlation is very important for a judicious therapy.

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Assessment of Dental Myths among the Subjects Attending a Dental Institution in Virajpet, Karnataka

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ABSTRACT

Introduction: Most of the human beliefs are acquired through communication, which is not always substantiated by facts and prevalent due to a variety of reasons like illiteracy, cultural beliefs and misconceptions. These beliefs in the field of dentistry misguide the patients and are a barrier in oral care delivery system. Aim of the study was to assess dental myths among subjects with different socioeconomic status attending a dental institute.

Material and method: A self-administered questionnaire was used among 367 participants aged 18 years and above selected randomly.

Results: There was a statistically significant association between Socioeconomic Status and questions related to teething, biting of hard substances, stains, brushing several times a day etc.

Conclusion: Many subjects were surprisingly unaware of the facts of dentistry. The various myths in the field of dentistry and about dental treatment which are still in the minds of general population should be set right.

Keywords: Misbelieves, Taboos in dentistry, Dental misconception.

INTRODUCTION

A culture is a way of life of a group of people - the behavior, beliefs, values and symbols that they accept, generally without thinking about them, and that are passed along by communication and imitation from one generation to the next.¹ It is defined as "learned behavior which has been socially acquired." Culture is the product of human societies and man is largely a product of his cultured environment.² Most of humans' beliefs, or at least most of their general beliefs, are acquired through communication. In fact, most of our misbelieves are culturally transmitted rather than individual mistakes, distortions, or delusions.³

India is a country with multitude cultures and its culture has its own concepts, beliefs based on its tradition shared by its people. Every culture has its own concepts of health, sickness and health promotion depicting values, belief, knowledge and practices.⁴

Myths take a very natural unknown origin in every community, describing plausible but, extraordinary past events.⁵ In our country, traditional belief of non-scientific base and

untrained unqualified dental professionals (quacks) are the main origin of myth.⁶

Most of these beliefs, especially in the field of dentistry misguide the patients and it is also a prime barrier in the oral care delivery system and also in the dental utilization pattern.³ Lots of dentistry related myths, which are considered as not to be false often, make people hesitant.⁷

Some of the myths are factual and thus can be believed. It's very much necessary to understand and to know what reality is. According to earlier literature the main reason for dental myths among dental patients was lack of awareness.⁷ Search of the literature revealed limited studies and data available related to this subject.

The aim of this study was to assess dental myths and to find out the association between the sociodemographic variables among the subjects attending Coorg Institute of Dental Sciences (CIDS), Virajpet.

MATERIALS AND METHODS

The study was conducted among 367 subjects aged 18 years and above attending outpatient department of Coorg Institute of Dental Sciences, Virajpet. Ethical clearance was obtained from the institutional review board and individual informed consent was taken. Those subjects who were not willing to participate and subjects in critical and emergency conditions were excluded. The study was conducted in the month of May and June 2014.

A pretested close-ended self-administered questionnaire was used to collect data on dental myths and demographic variables. The validity of questionnaire was checked by conducting a pilot study on 20 subjects visiting the dental college.

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The questionnaire was designed in English and then it was translated into Kannada and Malayalam. Kannada/ Malayalam/ English questionnaire was given according to the preferences of the participants. Questionnaire was distributed randomly to the participants and sufficient time was given to answer the questionnaire which was collected back on the same day.

2.1 Sample size is calculated using the relation $n=N/1+Ne2$, Where level of precision is

95%, i.e., $e= 0.05$

Total number of new subjects attending CIDS per day = 70 to 80 (75 ± 5)= 4500; Substituting the values in the above mentioned formula, the sample size obtained for the Study was, $n = 4500/ 1+ (4500 \times [0.05 \times 0.05]) = 367$

STATISTICAL ANALYSIS

The survey data so obtained from the selected sample was compiled, systematized, tabulated and master sheet was prepared (MS-Office, Excel). The data was analyzed using SPSS version 17. The level of significance was set at 5%. Statistical tools used – Descriptive Statistics, Chi-square test.

Age	No. of subjects	Male (%)	Female (%)
18-35 yrs.	236 (64.3%)	127 (53.8)	109 (46.2)
36-55 yrs.	115 (31.3%)	60 (52.2)	55 (47.8)
>55 yrs.	16 (4.4%)	9 (56.3)	7 (43.7)
Total	367	196	171

Table-1: Distribution of Study subjects based on Age and Gender

RESULTS

Table no.1 shows that study population consisted of 46.6% (n=171) females and 53.4% (n=196) males and majority of the subjects were in the age group of 15-35 years (64.3%). Among the study population, 138 (37.6%) had college education level and 99 (27%) were skilled workers. Table no. 3 shows that 230 (62.8%) were married. According to socio economic status 4 subjects (1.08%) belong to lower class, 263 (71.66%) subjects to upper lower socioeconomic class, 92 (25.06%) to lower middle class and 6 (1.63%) subjects to upper middle class.

Table no. 2, 3 and 4 shows that there was a statistically significant association between socioeconomic status and the following questions: Q1- teething will lead to dysentery ($p<0.026$); Q7- biting of hard substances will make the teeth strong ($p<0.022$); Q8- stains are due to biting of brinjal or banana stem($P<0.048$); Q17- brushing several times a day and using too much force help to prevent tooth decay ($p<0.049$); Q18- there is no need to see a dentist if you don't feel or see apparent dental problem ($p<0.024$); Q21- a pregnant lady is not supposed to take dental treatment until after delivery ($p<0.018$); Q22- the sure way of treating toothache is extraction ($p<0.049$); Q28- X-ray is not required for dental treatment ($p<0.008$).

However there was no statistically significant association between Socioeconomic Status and the following questions: Q2- dental infection will spread among siblings ($p<0.085$); Q3- Dental infection results from god's Curse($p<0.577$); Q4- cleaning with salts or fine soil will make tooth white and shiny($p<0.072$); Q5- of "neemstick" or" datoon" instead of

Questions/ Response	Lower class (%)	Upper lower (%)	Lower middle (%)	Upper middle (%)	Total (%)	chi-square test	p-value	
Q1.	Agree	4 (2.7)	108 (73)	31 (20.9)	5 (3.4)	148 (100)	9.294	0.026*
	Disagree	0 (0)	155 (70.8)	61 (27.9)	3 (1.4)	219 (100)		
Q2.	Agree	1(1.0)	79 (81.4)	15 (15.5)	2 (2.1)	97 (100)	6.624	0.085
	Disagree	3 (1.1)	184 (68.1)	77 (28.5)	6 (2.2)	270 (100)		
Q3.	Agree	0 (0.0)	32 (71.1)	13 (28.9)	0 (0.0)	45 (100)	1.978	0.577
	Disagree	4 (1.2)	231 (71.7)	79 (24.5)	8 (2.5)	322 (100)		
Q4.	Agree	3(1.4)	151 (72.6)	53 (25.5)	1 (0.5)	208 (100)	6.996	0.072
	Disagree	1 (0.6)	112 (70.4)	39 (24.5)	7 (4.4)	159 (100)		
Q5.	Agree	4 (2.1)	144 (74.6)	42 (21.8)	3 (1.6)	193 (100)	6.606	0.086
	Disagree	0 (0.0)	119 (68.4)	50 (28.7)	5 (2.9)	174 (100)		
Q6.	Agree	0 (0.0)	52 (73.2)	18 (25.4)	1 (1.4)	71 (100)	1.233	0.745
	Disagree	4 (1.4)	211 (71.3)	74 (25.0)	7 (2.4)	296 (100)		
Q7.	Agree	3 (2.9)	81 (78.6)	18 (17.5)	1 (1.0)	103 (100)	9.590	0.022*
	Disagree	1 (0.4)	182 (68.9)	74 (28.0)	7 (2.7)	264 (100)		
Q8	Agree	0 (0.0)	106(74.1)	37 (25.9)	0 (0.0)	143 (100)	7.920	0.048
	Disagree	4 (1.8)	157 (70.1)	55 (24.6)	8 (3.6)	224 (100)		
Q9	Agree	0 (0.0)	83 (72.2)	30 (26.1)	2 (1.7)	115 (100)	2.050	0.562
	Disagree	4 (1.6)	180 (71.4)	62 (24.6)	6 (2.4)	252 (100)		
Q10	Agree	3 (2.4)	89(70.6)	29 (23.0)	5 (4.0)	126 (100)	6.100	0.107
	Disagree	1 (0.4)	174 (72.2)	63 (26.1)	3 (1.2)	241 (100)		

* P <0.05; ** P < 0.01

Table-2: Association between the Socioeconomic Status and the various questions of the questionnaire

Questions/ Response	Lower class (%)	Upper lower (%)	Lower middle (%)	Upper middle (%)	Total (%)	chi-square test	p-value	
Q11	Agree	3 (3.2)	70 (73.7)	19 (20.0)	3 (3.2)	95 (100)	6.978	0.073
	Disagree	1 (0.4)	193 (71.0)	73 (26.8)	5 (1.8)	272 (100)		
Q12	Agree	1 (0.9)	83 (71.6)	26 (22.)	6 (5.2)	116 (100)	7.526	0.057
	Disagree	3 (1.2)	180 (71.7)	66 (16.3)	2 (0.8)	251 (100)		
Q13	Agree	0 (0.0)	87 (70.2)	32 (25.8)	5 (4.0)	124 (100)	5.089	0.165
	Disagree	4 (1.6)	176 (72.4)	60 (24.7)	3 (1.2)	243 (100)		
Q14	Agree	1 (0.9)	84 (73.0)	29 (25.2)	1 (0.9)	115 (100)	1.440	0.696
	Disagree	3 (1.2)	179 (71.0)	63 (25.0)	7 (2.8)	252 (100)		
Q15	Agree	3 (2.9)	73 (70.2)	27 (26.0)	1 (1.0)	104 (100)	5.367	0.147
	Disagree	1 (0.4)	190 (72.2)	65 (24.7)	7 (2.7)	263 (100)		
Q16	Agree	0 (0.0)	70 (71.4)	23 (23.5)	5 (5.1)	98 (100)	6.832	0.077
	Disagree	4 (1.5)	193 (71.7)	69 (25.7)	3 (1.1)	269 (100)		
Q17	Agree	0 (0.0)	152 (71.4)	58 (27.2)	3 (1.4)	213 (100)	7.871	0.049*
	Disagree	4 (2.6)	111(72.1)	34 (22.1)	5 (3.2)	154 (100)		
Q18	Agree	0 (0.0)	139 (73.5)	49 (25.9)	1 (0.5)	189 (100)	9.426	0.024*
	Disagree	4 (2.2)	124 (69.7)	43 (24.2)	7 (3.9)	178 (100)		
Q19	Agree	3 (2.7)	78 (69.6)	30 (26.8)	1 (0.9)	112 (100)	5.239	0.155
	Disagree	1 (0.4)	185 (72.5)	62 (24.3)	7 (2.7)	255 (100)		
Q20	Agree	4 (1.8)	155 (68.6)	62 (27.4)	5 (2.2)	226 (100)	4.589	0.204
	Disagree	0 (0.0)	108 (76.6)	30 (21.3)	3 (2.1)	141 (100)		

* P < 0.05; ** P < 0.01

Table-3: Association between the Socioeconomic Status and the various questions of the questionnaire.

Questions/ Response	Lower class (%)	Upper lower (%)	Lower middle (%)	Upper middle (%)	Total (%)	chi-square test	p-value	
Q21.	Agree	0 (0.0)	136 (67.7)	60 (29.9)	5 (2.5)	201 (100)	10.084	0.018
	Disagree	4 (2.4)	127 (76.5)	32 (19.3)	3 (1.8)	166 (100)		
Q22.	Agree	3 (2.8)	69 (63.9)	34 (31.5)	2 (1.9)	108 (100)	7.877	0.049
	Disagree	1 (0.4)	194 (74.9)	58 (22.4)	6 (2.3)	259 (100)		
Q23.	Agree	0 (0.0)	101 (73.2)	36 (26.1)	1 (0.7)	138 (100)	4.722	0.193
	Disagree	4 (1.7)	162 (70.7)	56 (24.5)	7 (3.1)	229 (100)		
Q24.	Agree	1 (0.6)	118 (72.8)	41 (25.3)	2 (1.2)	162 (100)	1.846	0.605
	Disagree	3 (1.5)	145 (70.7)	51 (24.9)	6 (2.9)	205 (100)		
Q25.	Agree	3 (1.3)	162 (67.8)	66 (27.6)	8(3.3)	239 (100)	7.669	0.053
	Disagree	1 (0.8)	101 (78.9)	26 (20.3)	0 (0.0)	128 (100)		
Q26.	Agree	0 (0.0)	104 (70.7)	38 (25.9)	5 (3.4)	147 (100)	4.440	0.218
	Disagree	4 (1.8)	159 (72.3)	54 (24.5)	3 (1.4)	220 (100)		
Q27.	Agree	1 (1.1)	72 (80.9)	16 (18.0)	0 (0.0)	89 (100)	6.318	0.097
	Disagree	3 (1.1)	191 (68.7)	76 (27.3)	8 (2.9)	278 (100)		
Q28	Agree	3 (3.1)	63 (64.3)	32 (32.7)	0 (0.0)	98 (100)	11.765	0.008**
	Disagree	1 (0.4)	200 (74.3)	60 (22.3)	8 (3.0)	269(100)		
Q29	Agree	3 (2.2)	92 (66.7)	38 (27.5)	5 (3.6)	138 (100)	5.806	0.121
	Disagree	1 (0.4)	171 (74.7)	54 (23.6)	3 (1.3)	229 (100)		
Q30	Agree	0 (0.0)	80 (74.1)	28 (25.9)	0 (0.0)	108 (100)	5.173	0.160
	Disagree	4 (1.5)	183 (70.7)	64 (24.7)	8 (3.1)	259 (100)		
Q31	Agree	0 (0.0)	110 (71.0)	44 (28.4)	1 (0.6)	155 (100)	7.021	0.071
	Disagree	4 (1.9)	153 (72.2)	48 (22.6)	7 (3.3)	212 (100)		

* P < 0.05; ** P < 0.01

Table-4: Association between the Socioeconomic Status and the various questions of the questionnaire.

toothbrush will be more effective for oral hygiene(P<0.086); Q6- use of brick powder makes the teeth strong(P<0.745); Q9- scaling will weaken the tooth structure (P<0.562); Q10- placing of tobacco over painful tooth will reduce pain (p<0.107); Q11- consumption of alcohol will reduce tooth

pain(p<0.073); Q12- extraction of teeth will affect eye vision (p<0.057); Q13- extraction of upper teeth will affect brain (p<0.165); Q14- eruption of third molar will increase wisdom(p<0.696); Q15- exfoliated tooth should be buried(p<0.147); Q16- tooth will erupt at old age (p<0.077);

Q19- we should not eat anything when we are going for tooth extraction ($p < 0.155$); Q20- we should not extract or do RCT when we have a swelling especially abscess ($p < 0.204$); Q23- putting powder of pain killer like aspirin, panadol and cafenol in the hole of decay tooth help to stop pain ($p < 0.193$); Q24- good teeth are inherited ($p < 0.605$); Q25- there is no need to worry about milk teeth as they will eventually fall out with time ($p < 0.053$); Q26- teeth eruption in child causes diarrhoea ($p < 0.218$); Q27- a child born with teeth (neonatal) or whose upper front teeth erupt before the lower tooth is a sign of bad luck in the family ($p < 0.097$); Q29- we should not brush our teeth if there is bleeding during brushing ($p < 0.121$); Q30- cavity is due to leaching of calcium by baby during pregnancy ($p < 0.160$); Q31- there are more than two sets of teeth in some human being ($p < 0.071$) as shown in Table no.4.

DISCUSSION

Oral hygiene awareness and practices may differ from country to country and among communities depending on traditional beliefs and socioeconomic development.⁶ The purpose of the present study was to assess the dental myths among subjects according to socio economic status. In the present study majority of subjects belonged to social class of upper lower (71.66%) and lower middle (25.06%).

About the myths 65% of study subjects are having an opinion of not to worry about milk teeth, which is slightly more than compared to the study done by Vignesh R and Priyadarshni I, where 64.8% respondents believed that decay in milk teeth need not be treated as they are going to fall away.⁵ In the present study 58% participants thought that brushing several times a day and using too much of force helped in preventing tooth decay. This was in agreement with the study done by Vignesh R and Priyadarshni I, where 70% respondents believed that the more they brushed using hard bristled brush whiter the teeth became.⁵

56.7% of subjects had a conception that dental infections spread among siblings. These results are in contrast to a study done by N Saravanan and R Thiruneevannan, where only 13% thought so, and 56.7% of subjects had a conception that cleaning with salts or fine soil for white and shiny teeth.⁸ This was in agreement with the study done by Vignesh R et al, where 56.8 % thought so.⁵ But this was in contrast to the study results done by N Saravanan et al, where only 15% thought so.⁸

54.8% are having a misconception that pregnant lady is not suppose to take dental treatment until after delivery which will cause her to suffer more during pregnancy. 52.6% of the study subjects thought using of neemstick instead of toothbrush was more effective for oral hygiene. The result was in contrast to the study done by N Saravanan and R Thiruneevannan where only 18% believed so.⁸

51.5% of the subjects have a concept that, there is no need to see a dentist if there is no apparent dental problem. These results were in agreement with the study done by Vignesh

R and Priyadarshni I, where 68.4% believed that it is not required to visit a dentist unless pain occurred in teeth.⁵ 31-50 % of the subjects have the misconception like stains due to biting of brinjal or banana stem, scaling would weaken the tooth structure, brushing their teeth if there was bleeding during brushing, placing of tobacco to reduces tooth pain, extraction and effect on eye vision, extraction of upper teeth affected the brain, not eat anything when they are going for tooth extraction and 31.3% for third molar eruption and increasing wisdom.

10-30 % of the subjects have the misconception like dental infections due to God curse, using of brick powder to makes the teeth strong, biting of hard substances for strong teeth, consumption of alcohol reduced tooth pain, tooth erupted at old age, child born with teeth of bad luck in the family, leaching of calcium from the mother by the baby during pregnancy leading to cavity and exfoliated tooth should be buried.

CONCLUSION

In this 21st century with lot of advancements in dental field still several patients are unaware of the facts of dentistry. In the present study the myths about dentistry varied up to 65% in some questions. More than 50% of subjects having myths in many questions, the various myths in the field of dentistry and regarding dental treatment which is still in minds of general population should be set right. So, it's our duty to help the people learn and know the reality and take necessary steps to rectify them.

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Gingival Recession and Various Root Coverage Procedures: A Review

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ABSTRACT

Esthetics is of prime concern in today's sophisticated and modernised society. Esthetics is the science of beauty and encompasses almost every field of dentistry. Gingival recession is defined as the oral exposure of the root surface due to a displacement of the gingival margin apical to the cement-enamel junction and it is regularly linked to the deterioration of dental aesthetics. It has been associated with many factors such as inflammatory periodontal disease, developmental anatomic abnormalities (aberrant frenal attachment, thin bony plate), toothbrush injury, tooth malposition and iatrogenic factors. Apart from compromised esthetics, gingival recession also results in a variety of other problems such as root hypersensitivity, a higher incidence of root caries and diminished plaque control, thus necessitating treatment. Successful treatment of recession-type defects is based on the use of predictable periodontal plastic surgery (PPS) procedures.

Keywords: Gingival recession, cemento-enamel junction, periodontal plastic surgery

INTRODUCTION

Gingival recession is the displacement of the gingival margin apical to the cemento-enamel junction (CEJ).¹ It is observed more frequently on the labial/buccal surfaces of the teeth and is probably one of the most common esthetic concerns associated with the periodontal tissues. Recession refers to the location of the gingiva, not its condition. Receded gingiva can be inflamed but may be normal except for their position. Recession may be localized to one tooth or a group of teeth, or it may be generalized throughout the mouth.² Apart from compromised esthetics, gingival recession often results in a variety of other problems as well such as root hypersensitivity, a higher incidence of root caries and diminished plaque control, thus necessitating treatment.

ETIOLOGY OF GINGIVAL RECESSION³

The cause of gingival recession whether localized or generalized is not always easy to determine but is essential prior to treatment planning. The following factors have been incriminated.

- Inflammatory periodontal disease (considered as the principal etiologic factor), Ageing, Developmental anatomic abnormalities (dehiscences, thin bony plates, high frenum attachments), Malaligned tooth, Toothbrush trauma, Delete-

rious habits (pressure from foreign objects, fingernails, pencils, hairpins), Iatrogenic factors (orthodontic forces, pressure from bands, arch wires, clasps, subgingival restorations, post periodontal surgery).

PATHOGENESIS

The process of apical migration of marginal gingiva over the root surface results in the condition of gingival recession. The definition of the condition of gingival recession: Some slight apical shift of supra-crestal connective tissue attachment that is the cementum which is exposed and has already lost attachment to the collagenous gingival fibers which are found just coronal to the crest of the alveolar bone and just apical to the junctional epithelium. It is the continual apical migration of gingival fibers attachment and marginal gingiva which characterizes the process of recession.⁴

Histologically, the destruction of gingival tissues, due to mechanical forces or related to inflammatory periodontal disease, is associated with loss of periodontal connective tissue fibers and alveolar bone.

For gingival augmentation, the main objective is to increase width and thickness of the gingiva in areas where the amount of keratinized tissue is judged clinically inadequate. However, scientific data do not support the hypothesis that gingival tissue dimensions are critical to the prevention of gingival recession defects.^{5,6} Nevertheless, gingival augmentation should be considered where a change in mucogingival morphology may facilitate plaque control and when alveolar bone dehiscence would be anticipated as a result of orthodontic tooth movement.⁷ Ideally, surgical treatment of gingival recession defects should fully restore the anatomy of the mucogingival complex. However, aesthetic concerns are usually the reason to perform these procedures. This im-

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plies regeneration of the attachment apparatus of the tooth, including cementum with inserting connective tissue fibers, and alveolar bone, as well as recreation of topographic relationships between the keratinized tissue and the alveolar mucosa that are functionally and aesthetically acceptable to the patient.⁴

Certainly, the ultimate goal of periodontal therapy is regeneration. This involves the elimination of diseased state and replacement with a healthy state, in which all tissues that are originally found have been restored. Regeneration has been defined as "The natural renewal of a structure, produced by growth and differentiation of new cells and intercellular substance to form new tissues or part".⁸

INCIDENCE AND PREVALENCE:

Gorman⁹ stated that recession increased in both numerical as well as linear dimension with age. The occurrence of recession was found to vary from 54.5% of all the subjects in the 16-25 years of age group to 100% in the 46-86 years of age groups. The most pronounced increase was from 26-35 years to the 36-45 years of age groups. Males showed greater recession than females of the same groups.⁹ Occurrence of recession can be seen as early as 15 years as per Guilha et al.¹⁰ Woolfer¹¹ showed that incidence varies from 8% in children to 100% after the age of 50 years. Yoneyama et al.¹² stated that, it is common in populations with good as well as poor oral hygiene. Buccal recession seems to be more common and more advanced at single rooted teeth than at molars. The attachment loss difference observed between different surfaces of a given tooth or a group of teeth. The data suggested that in younger subject groups, progression was confined to a subset of individuals, while in older age groups, more subjects and sites became involved.¹⁴

A 3-year longitudinal study was conducted to find out the occurrence of gingival recession in mandibular incisors. 28 children aged 6-13 years, with gingival recession localized to mandibular incisors, were monitored longitudinally to evaluate any changes of the labial periodontal tissues. Gradual reductions in the amount of gingival recession and probing attachment levels took place in all children except for one of the subjects with one severely malpositioned tooth. Probing depths and widths of keratinized and attached gingiva remained relatively unchanged. This finding showed that, gingival recession in mandibular incisors in young children often improves over time which suggests that, preventive or reparative treatment in this part of the developing dentition may not be necessary. Decisions about such treatment should be postponed until any spontaneous improvement has taken place.¹⁵

A study was carried out to assess the development of gingival recession in young adult smokers and nonsmokers. At the outset, 50% of subjects presented with gingival recession at one or more sites. There was no significant difference in the prevalence of gingival recession between non-smokers and

smokers. The risk for recession development appeared not to be influenced by smoking status after adjusting for periodontal probing depth, recession at baseline, tooth brushing frequency, gender, jaw, tooth type and site. Their study did not support the hypothesis that, smokers are at an increased risk for the development of gingival recession.¹³

CLASSIFICATION OF GINGIVAL RECESSION

Several classification systems have been proposed in the literature in order to facilitate the diagnosis of gingival recession.

Sullivan's and Atkins in 1968 classified recession into four categories.¹⁶

Shallow – Narrow. 2) Shallow – Wide. 3) Deep – Narrow, 4) Deep – Wide

Mlinek et al in 1973 classified recession as⁴

1. Shallow-narrow clefts as being <3 mm in both dimensions.
2. Deep-wide defects as being >3 mm in both dimensions.

Miller's classification of gingival recession⁵

Four types of recession defects were categorized on the basis of evaluation of the soft and hard periodontal tissues.

Class I – Marginal tissue recession does not extend to the mucogingival junction (MGJ). There is no periodontal loss (bone or soft tissue) in the interdental area and 100% root coverage can be anticipated.

Class II - Marginal tissue recession that extends to or beyond the MGJ. There is no periodontal loss (bone or soft tissue) in the interdental area and 100% root coverage can be anticipated.

Class III - Marginal tissue recession that extends to or beyond the MGJ. Bone or soft tissue loss in the interdental area is present or there is malpositioning of the teeth, which prevents the attempting of 100% of root coverage. Partial root coverage can be anticipated.

Class IV - Marginal tissue recession that extends to or beyond the MGJ. The bone or soft tissue loss in the interdental area and/or malpositioning of teeth is so severe that root coverage cannot be anticipated.

Mahajan's modification of Miller's classification⁷

1. Class I: Gingival tissue recession not extending to mucogingival junction.
2. Class II: Gingival tissue recession extending to mucogingival junction or beyond it.
3. Class III: Gingival tissue recession with bone or soft-tissue loss in interdental area up to cervical 1/3 of root surfaces and/or malpositioning of the teeth.
4. Class IV: Gingival tissue recession with severe bone or soft tissue loss in interdental area greater than cervical 1/3 of root surface and/or severe malpositioning of teeth.

Prognosis according to Mahajan's modification

BEST - Class I and Class II with thick gingival profile.

GOOD - Class I and Class II with thin gingival profile.

FAIR - Class III with thick gingival profile.

POOR - Class III and Class IV with thin gingival profile.

Cairo et al⁷ taking into account the desirable characteristics of a classification system (usefulness, exhaustiveness, disjointness and simplicity) suggested by Murphy (1997), the following classification of gingival recession was then identified based on the assessment of clinical attachment level (CAL) at both buccal and interproximal sites.⁷

1. Recession Type 1 (RT1): Gingival recession with no loss of interproximal attachment. Interproximal cemento-enamel junction (CEJ) was clinically not detectable at both mesial and distal aspects of the tooth.
2. Recession Type 2 (RT2): Gingival recession associated with loss of interproximal attachment. The amount of interproximal attachment loss (measured from the interproximal CEJ to the depth of the interproximal pocket) was less than or equal to the buccal attachment loss (measured from the buccal CEJ to the depth of the buccal pocket).
3. Recession Type 3 (RT3): Gingival recession associated with loss of interproximal attachment. The amount of interproximal attachment loss (measured from the interproximal CEJ to the depth of the pocket) was higher than the buccal attachment loss (measured from the buccal CEJ to the depth of the buccal pocket).

TREATMENT OF GINGIVAL RECESSION

Compromised esthetics, root hypersensitivity, diminished plaque control, progression of defect; etc resulting from gingival recession may warrant its treatment. Investigation of etiologic factors and consideration of therapeutic options directed at minimizing the progression of apical migration of the marginal gingival tissue are the objectives for the treatment of gingival recession.

Various mucogingival surgeries have been proposed for the purpose of root coverage.¹

1. Pedicle grafts:
 - a. Rotational flaps.
 - Laterally positioned flap.
 - Obliquely rotated flap.
 - Double papilla flap.
 - b. Advanced flaps.
 - Coronally positioned flap.
 - Semilunar flap.
2. Free soft tissue grafts:
 - a. Epithelialized (classical gingival graft).
 - b. Non-epithelialized.
3. Combination grafts:
 - 1-Stage procedure.
 - Connective tissue graft plus pedicle graft.
 - Biodegradable membrane barrier plus pedicle graft.

2-Stage procedure.

- Coronally positioned previously placed soft tissue graft.
- Non-biodegradable membrane barrier plus pedicle graft.

TECHNIQUES FOR ROOT COVERAGE

Rotational flap procedures

The use of a laterally repositioned flap to cover areas with localized recession was introduced by Grupe and Warren¹⁷ which was called the laterally sliding flap operation. In order to reduce the risk for recession on the donor tooth, Grupe¹⁸ suggested that the marginal soft tissue should not be included in the flap. Staffileno¹⁹ and Pfeifer & Heller¹⁹ advocated the use of split thickness flap to minimize the potential risk for the development of dehiscence at the donor tooth.

Laterally positioned flap

Grupe & Warren¹⁷ introduced contiguous soft tissue autografts to the literature under the term "lateral sliding flap" currently known as the laterally positioned pedicle graft. For successful root coverage using laterally positioned pedicle graft, these three criteria must be met.

1. Adequate donor tissue laterally.
2. Normal to deep vestibule.
3. Recession involving only one tooth.

Double papilla repositioned flap

Double papilla graft is the variation of the laterally positioned graft which was given by Cohen and Ross.²⁰ This procedure evolved in an attempt to use minimal amounts of gingiva for root coverage. It is indicated in where there is recession of labial or lingual gingiva, but destruction of the interdental papillae on either side of the denuded area has not occurred. Recession of this type is observed in areas where trauma from incorrect tooth brushing has destroyed the gingiva and cleft formation develops. This pattern of gingival recession is noted on the labial or buccal surfaces of roots where the involved tooth is in labial version to the approximating teeth. If the adjacent area to the recession is intact with no pocket formation or minimal in the proximal areas, then joining both papillae together to form a flap will repair the area of root exposure. The restoration of the gingival unit is advantageous not only from the cosmetic standpoint but also from a functional aspect. Covering the exposed root surface with gingiva has helped to reduce or eliminate the problem of hypersensitivity. This procedure may also permit the covering of the margin of a restoration which has been exposed by recession.

Pedicle soft tissue graft procedures combined with membrane barriers:

The use of membrane barrier, according to the principles of guided tissue regeneration (GTR), in conjunction with pedi-

cle soft tissue graft procedures was introduced as a treatment modality for root coverage. A membrane barrier is placed between the graft and the root in order to favor the regeneration of the periodontium.

According to the concept of the GTR, a critical factor for the outcome of the treatment procedure is that a space for tissue formation is established between the facial root surface and the membrane and maintained during the healing. In order to create such a space, Pini Prato et al²¹ suggested that extensive root planing should be carried out to produce a concave morphology. Specially designed membranes for the treatment of recession type defects are also available, such as non-absorbable titanium-reinforced expanded polytetrafluoroethylene (ePTFE) membranes and a variety of bioabsorbable membranes but many of these may not be rigid enough for maintaining required space during healing.

FREE SOFT TISSUE GRAFT PROCEDURES

A free soft tissue of the masticatory mucosa is usually selected when,

1. There is no acceptable donor tissue present in the area adjacent to the recession defect.
2. Thicker marginal tissue is desirable.

Epithelialized soft tissue graft

The epithelialized free soft tissue graft procedure can be performed either as a two-step surgical technique, where an epithelialized free soft tissue graft is placed apical to the recession and following healing is coronally positioned over the denuded root, or as a one-step technique, in which the graft is placed directly over the root surface.

The classic epithelialized palatal graft was originally presented by King and Pennel in 1964 as a gingival augmentation procedure with the following treatment goals:

1. To establish a soft tissue margin of keratinized tissue.
2. To prevent further recession.
3. To negate the effects of an aberrant frenum.
4. To produce a soft tissue margin that enables the patient to practice a high level of plaque removal without traumatizing the soft tissue.
5. To be used as an adjunctive treatment when margins of restorations must be placed in the gingival sulcus.

Drawbacks of epithelialized palatal graft

1. The technique is difficult to perform. It is technically demanding from the suturing point of view.
2. The technique is time-consuming.
3. A blood supply to the graft is available on only one surface rather than two, as with the connective tissue graft, and so, more difficult to achieve and it is difficult to stabilize the epithelialized tissue.
4. The palatal wound (donor site) is more invasive, more prone to hemorrhage, and slower to heal. It is painful and ulcerated. Thus, it is more annoying to the patient

during the healing phase.

5. When the epithelialized palatal graft is used for root coverage grafting, a functional result is produced, but the color match of the tissues is often less than ideal. On healing, the grafted palatal tissue tends to be lighter (whiter) and more opaque than gingiva.
6. Furthermore, one does not expect to see grafted masticatory mucosa extending deep into the vestibule.
7. Another problem in free grafting is the thickness of the tissue on healing. Often a slight abrasion of the healed graft is necessary to produce the most esthetic result.

Although the subepithelial connective tissue graft has become increasingly popular for root coverage, the epithelialized palatal graft is still used for gingival augmentation when thicker tissue is desired, when esthetic is not a concern, when there is a need to deepen the vestibule, or when pinker tissue is required as in removing an amalgam "tattoo".

SUBEPITHELIAL CONNECTIVE TISSUE GRAFT (SCTG)

According to Karring et al¹⁴ gingival connective tissue is a viable source of cells for repopulating the epithelium. Free connective tissue graft was first used by Edel²² to increase the width of keratinized gingiva. The use of connective tissue graft for treatment of gingival recession was first reported in 1985 by Langer and Langer,²³ who described the "Subepithelial connective tissue graft procedure" for covering gingival recession of single as well as multiple teeth. Raetzke²⁴ performed connective tissue grafting with an "Envelope technique" and achieved 80% root coverage.

Various other modifications were proposed by Nelson²⁵, Harris²⁶, Blanes and Allen²⁷, Santerelli et al²⁸ and Tozum.^{29,30}

The SCTG is usually harvested from the palate. The thickest donor tissue can be harvested from the premolar region of the palate. If sufficient tissue cannot be obtained from one side, the contralateral side of the palate may be utilized simultaneously. Greater tissue availability is found with a high palatal vault than a low palatal vault. The height, length and thickness of donor tissue that can be obtained varies with the differing anatomic dimensions of the palatal vault.²⁹

CORONALLY ADVANCED FLAP TECHNIQUE³¹

The coronally advanced flap (CAF) is a procedure frequently used in periodontal plastic surgery. The main objective of this surgical technique is to mobilize the gingival margin and reposition it at a level more coronal (incisal direction) than its original location. CAF is mainly used for the treatment of gingival recessions. The procedure was originally introduced by Allen & Miller in 1989, throughout time. Several authors proposed modifications to the original technique.

Indications for Coronally Advanced Flap^{31,32}

1. Coverage of certain types of gingival recessions.

2. Esthetic coverage of exposed roots.
3. For tooth sensitivity owing to gingival recession.

Contraindications for Coronally Advanced Flap:

1. Lack of keratinized tissue.
2. Shallow vestibule.

Evidence shows that a coronally advanced flap alone in many instances results in complete root coverage and is stable over time. A coronally advanced flap is less invasive for the patient, requires less chair-time and probably less surgical skill. It would therefore be desirable to use a coronally advanced flap approach when indicated. It has been hypothesized that a coronally advanced flap approach alone could be successfully applied when the residual gingiva is thick and wide. It can be used in treating single or multiple recession defects. In an attempt to obtain higher success rate of root coverage in aesthetic zone, combination of different procedures have been used. A recent innovation in dentistry is the use of Platelet-Rich Fibrin (PRF), a concentrated suspension of the Concentrated Growth Factors (CGF), along with the root coverage procedures in recession defects to enhance wound healing and tissue regeneration.

CONCLUSION

Among the various treatment modalities, root coverage with coronally advanced flap holds the most promising results. Studies have been done by using this technique and the results provided significant root coverage, clinical attachment level and keratinized tissue gain as compared to various other procedures and hence could be considered as the "gold standard" procedure in the treatment of gingival recession defects.

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A Study on Intra-Operative Difficulties in Repeat Caesarian Sections

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ABSTRACT

Introduction: Caesarian section has become better with sophistication in anaesthesia and surgery, however little is known about the intra-operative difficulties involved in multiple caesarian sections. Therefore, the aim of the present study is to know type of intra-operative difficulties encountered and prevalence of those difficulties in proportion.

Material and method: The study was conducted in a tertiary care hospital. 100 subjects were included for the study by using inclusive and exclusive criteria. The data compiled in excel and compared with various variables like age, registration of the cases during pregnancy period etc. In the study, reasons for adopting caesarian type of delivery were assessed and type of difficulties faced during surgery was analyzed.

Results: 46% of cases were in the age group of 18-23 years & 48% in the age group of 23-28 years. 62% of the cases were booked for safe delivery. Emergency caesarian was done in 28% of cases. The following are the indications for present caesarians: CPD-16%, previous 2 caesarians-35%, foetal distress 18% and miscellaneous-31%. Low transverse incision was given in 96% of cases. In the intra-operative complications, 46% of the complications related to adhesions. The second commonest complication is hemorrhage. In 11% of cases bladder related complications were observed.

Conclusion: Adhesions and haemorrhages are the major complications in intra-operative period of repeat caesarian section. Adhesion not only slowed down the surgical procedure but also necessitated the change of surgeon to more experienced one.

Keywords: Intra-operative complications, CPD, foetal distress

due to frequent pregnancy complications like fetal distress, cephalo pelvic disproportion, bad obstetric history and scar dehiscence which resulted in repeat caesarian sections. During operation several difficulties may be encountered by the obstetrician like adhesions, haemorrhage, bladder injury, gastrointestinal tract injury, adherent placenta or rupture of scar.³ Conducting repeated caesarian sections not only challenging to the obstetrician but also strain on existing and limited healthcare resources as well as financial burden to the families.^{4,6} Therefore, the present study was to evaluate the type of difficulties faced while performing caesarian sections by obstetricians from a tertiary care hospital perspective.

MATERIALS AND METHODS

The study was carried out in the obstetric units of the Kamini Institute of Medical Sciences, Narketpally, Telangana State from the period of October 2010-September 2011. This is a both a referral center and territory center for high risk obstetric cases in Narketpally. All women who aged 18 years to 32 years with history of undergone previous caesarian were included in this study. This is a cross-sectional study where we included both retrospective and prospective studies during one year of the study. We enrolled both the sample of cases which are booked case with previously had antenatal checkups and also un-booked (unregistered) case who did not had no antenatal checkups or insufficient antenatal checkups. Those who have undergone laprotomy for some cause in the past and primigravida were excluded from the study. Following booking in the antenatal clinic, women who had no complications were seen subsequently every 4 weeks until 28 weeks, fortnightly until 36 weeks and weekly until the onset of labor or elective delivery. Women with complications were usually seen more frequently depending on their conditions; alternatively they could be admitted into

INTRODUCTION

Caesarian section is done when labour is contraindicated or vaginal delivery is found unsafe for the foetus or mother. The indications are broadly divided into two categories as absolute and relative. In the absolute category placenta previa, CPD, Pelvic mass obstruction, Carcinoma of cervix and vaginal obstructions are the major causes.¹

In the relative indications previous section, foetal distress, malpresentation, APH, systemic disorders, bad obstetric history and hypertensive disorders are the major causes for adopting caesarian sections.² "Once a caesarian, always a caesarian" because of safe mode of delivery associated with less perinatal complications despite high health and financial cost. Repeat caesarian sections are commonly performed

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the antenatal ward for in-patient care. These are the cases irrespective of emergency/elective caesarian section. The data was compiled and analyzed for intra-operative difficulties during emergency and elective caesarian section in repeat caesarian sections. During the pre and post operative period both clinical examination and necessary investigations like estimation of Hb, RBS, HIV etc., were done.

RESULTS

A total of 100 women made up of with at least one previous caesarian. Out of the 100 women with previous caesarian section cases studied 94 (94%) cases were of the age group 18 – 28 years; of which 46 (46%) cases were of age group between 18-23 years and 48 (48%) cases were of age group between above 23-28 years (Table 1).

Of total 100 case 72 (72%) cases were elective caesarian section and 28 (28%) were had emergency caesarian section. Out of 72 elective cases of which 31 cases were of age group between 18-23 years, 37 cases were of age group between above 23-28 years and only 4 cases in the age group of above 28-32 years (Table 2).

The indications for present caesarian section are shown in the figure 1. Out of 100 cases major indication were previous 2 or more caesarian sections which are about 35 (35%) cases. The other major indications for caesarian section were CPD 16% (16/100), intrapartum fetal distress 18% (18/100), bad obstetric history 6% (6/100) and scar dehiscence 6% (6/100) (Figure 1).

The frequent intra-operative complications observed during caesarian section in are shown in the figure 2. Out of 100 cases most common challenges observed during the surgery, are adhesions (46%), haemorrhage (16%), bladder drawn-up (11%), scar dehiscence (9%) and extension of angles (8%) (Figure 2). There were no injuries to surrounding structure due to surgery or during surgery.

DICUSSION

This present study from our department of Obstetrics and Gynaecology at Kamineni institute of medical sciences tried to identify the frequent intra-operative complications associated with multiple repeat caesarian sections. Repeat caesarian sections are commonly performed due to many reasons which might have risk fetal and maternal morbidity–mortality.

From this study more frequently adhesions were noted during operative delivery in the study group (46%), not unexpected as dense adhesion would tend to result from repeated surgery on the abdominal wall with increased chance of post-operative infection. These adhesions are as high as those in the multiple repeat caesarian sections who had more than four repeat caesarian sections.⁷ Operative and post-operative course, including duration of operation, estimated blood loss during surgery, might increase due to adhesions

Age group in years	No. of cases n = 100
18 – 23	46
>23 – 28	48
>28 – 32	6

Table-1: Age wise distribution of cases

Age group in years	No. of cases n=100	
	Emergency n=28	Elective N=72
18–23	15	31
>23–28	11	37
>28–32	2	4

Table-2: Age wise distribution of cases with elective/emergency caesarian sections

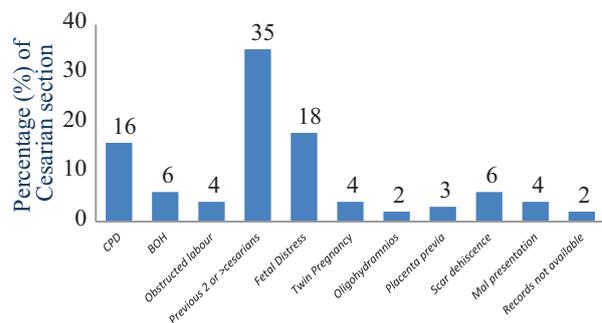


Figure-1: Indication for present caesarian section (n=100)

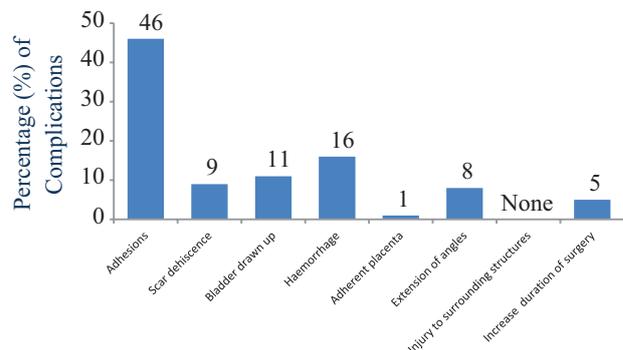


Figure-2: The incidence of intra-operative complications

and also could increase the incidence of wound infection and length of hospital stay this could again influence based on severity of pelvic adhesions.⁷

Of 100 patients from this study second most common complication was haemorrhage which was about 16%. The complication of haemorrhage was varied from different previous studies, study from Pradip Sambrey et al⁸ reported 24%, Anuradha Kumar et al³ reported 10% and A.Sirju Singh et al⁹ reported 22.3%. In the present study the overall incidence of haemorrhage as a part of intra-operative complication being 16% which is about 8% less than the study of Pradip Sambrey et al.⁸ From the operative point of view, a repeat number of previous caesarian sections is associated with technical difficulties in separation of adhesions and increased the average surgery time in the study, which might cause difficulty in achieving high Apgar score of the newborn and may increase requirement the neonatal intensive care unit. The success and the complication arising from labour in women

with previous caesarian sections require further evaluation. Usually, most obstetricians do not attempt trial of labour after previous caesarian sections. Need of last few visits to obstetricians in order to decide the mode of delivery to undergo elective or emergency section in a centre both between equipped and manual.

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CONCLUSIONS

Modern obstetrics practice for medical, social, economic and legal reasons had witnessed and increase in the primary caesarian section rate every year. This has created a common clinical entity of 'previous caesarian section'. In subsequent pregnancy giving high risk pregnant status to the reference pregnancy. Adhesions and haemorrhages are the major complications in intra-operative period of repeat section. These adhesions not only slowed down the surgical procedure but also necessitated the change of surgeon to more experienced one.

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A Study on Reasons for Repeated Cesarean Sections in a Tertiary Care Hospital

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ABSTRACT

Introduction: The cesarian section rate continues to rise in many countries with routine access to medical services. Therefore we tried to know the causes of cesarian sections in a tertiary care set up.

Material and methods: In this study 100 subjects were randomly taken after assessing for inclusive and exclusive criteria. During the preoperative period, the study subjects were examined clinically and necessary investigations were done. The data of the cases were compiled and analyzed. Variables like age, period of registry of the cases during pregnancy, Indications for previous cesarian sections etc., were analyzed. Three age groups were taken to analyze the study subjects: first group with 18-23 years, second group with 23-28 years and third group 28-32. In the present study, 46, 48 and 6 were registered in the above age groups. 38 of 100 cases were not booked prior to the delivery.

Results: Indications for the previous cesarian sections were analyzed. 26 of 100 cesarians were due to cephalo pelvic disproportion, 10 of 100 were due to bad obstetric history. 1 of 5 of the patients was suffering from hypertensive disorder. Malpresentation and failure to progress were the causes 12 of 100 cases in each category. During the present pregnancy also the reasons for opting for cesarian section were analyzed. 35 of 100 cases were due to previous 2 cesarians and in another 16 of 100 were due to cephalo pelvic disproportion. Fetal distress is observed in 18 cases.

Conclusion: The most common clinical entity for cesarian section is of previous cesarian section and followed by cephalo pelvic disproportion.

Key Words: Cesarean section, Cephalo pelvic disproportion, Malpresentation, foetal distress

INTRODUCTION

Cesarian section is defined as delivery of foetus through the incision in the abdominal wall (laparotomy)¹ in the uterine wall. Cesarean section is done when labour is contraindicated or vaginal delivery is found unsafe for the foetus or mother. The indications are broadly divided into two categories: 1. Absolute 2. Relative. Increasing rate of cesarian section between 1965-1988 by four times is not completely understood, but some explanations include the, women are having fewer children, raising maternal age, increasing incidence of breech presentation, decreased incidence of conducting mid-pelvic forceps and vaccum deliveries, increasing rates

of induction of labour, rise in prevalence of obesity, concern for malpractice litigation.¹ More than few decade ago it was reported that failure to perform a cesarian delivery and thus avoid adverse neonatal neurological outcome (Cerebral palsy) was the dominant obstetrical claim in the United states. In addition, few elective cesarian deliveries are now performed due to concern over pelvic floor injury associated with vaginal birth.² The picture has changed little specifically in 2001. A brain damaged infant was the claim responsible for 40% of all medico-legal indemnity paid by obstetrician and gynaecologists (physician's insurance of America 2002). Some elective cesarian deliveries are now performed due to concern over pelvic floor injury associated with vaginal birth.² The indications for cesarian section are multiple and multi-factorial. Repeated cesarian sections are associated with various complications like adhesions, haemorrhage, bladder injury etc.⁴ The present study has been taken up in a tertiary care set to evaluate the reasons for adopting cesarian section in place of vaginal delivery. The objective of this study is to evaluate the reasons for adopting repeat cesarian section in those who had previously cesarian section delivery.

MATERIALS AND METHODS

The study was carried out in the obstetric units of the Kamineni Institute of Medical Sciences, Narketpally, Telangana State from the period of October 2010-September 2011. This is a both a referral center and territory center for high risk obstetric cases in Narketpally. All women who are aged 18 years to 32 years with history of undergone previous cesarian were included in this study. This is a cross-sectional study where we included both retrospective and prospective stud-

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ies during one year of the study. We enrolled both the sample of cases which are booked case with previously had antenatal checkups and also un-booked (unregistered) case who had no antenatal checkups or insufficient antenatal checkups. Those who have undergone laprotomy for some cause in the past and primigravida were excluded from the study. Following booking in the antenatal clinic, women who had no complications were seen subsequently every 4 weeks until 28 weeks, fortnightly until 36 weeks and weekly until the onset of labor or elective delivery. Women with complications were usually seen more frequently depending on their conditions; alternatively they could be admitted into the antenatal ward for in-patient care. These are the cases irrespective of emergency/elective cesarian section. The data was compiled and analyzed for reasons for reasons for repeated cesarian sections. During the pre and post operative period both clinical examination and necessary investigations like estimation of Hb, RBS, HIV etc., were done.

RESULTS

A total of 100 women made up of with at least one previous cesarian. Out of the 100 women with previous cesarian section cases studied 94 (94%) cases were of the age group 18 – 28 years; of which 46 (46%) cases were of age group between 18-23 years and 48 (48%) cases were of age group between above 23-28 years (Table 1).

Of total 100 case 66 (66%) cases were booked and 44 (44%) were un-booked cases. Out of 66 booked cases of which 28 cases were of age group between 18-23 years, 34 cases were of age group between above 23-28 years and only 4 cases in the age group of above 28-32 years (Table 2).

Among women with those who had previous cesarian section, the commonest indications for primary cesarian section were cephalo pelvic disproportion (CPD) 26% (26/100), abnormal lie/malpresentation 20% (20/1005), suspicious fetal status/intrapartum fetal distress 12% (12/100), poor/failure to progress of labor and/or prolonged labor 12% (12/100) and bad obstetric history 10 (10/100) (Figure 1). Please see figure 1 for all other accounted reasons for previous cesarian sections. Of all those 100 cases of previous cesarian section, 72 (72%) were had elective cesarian sections.

The indications for present cesarian section are shown in the figure 2. Out of 100 cases major indication were previous 2 or more cesarian sections which are about 35 (35%) cases. The other major indications for cesarian section were CPD 16% (16/100), intrapartum fetal distress 18% (18/100), bad obstetric history 6% (6/100) and scar dehiscence 6% (6/100) (Figure 2).

DISCUSSIONS

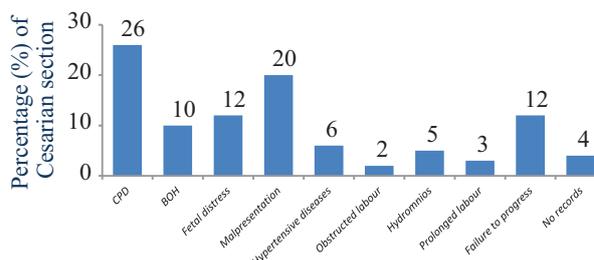
The present study from our department of Obstetrics and Gynaecology at Kamineni Institute of medical sciences has identified the risks associated with subsequent pregnancies

Age group in years	No. of cases n = 100
18 – 23	46
>23 – 28	48
>28 – 32	6

Table-1: Age wise distribution of cases

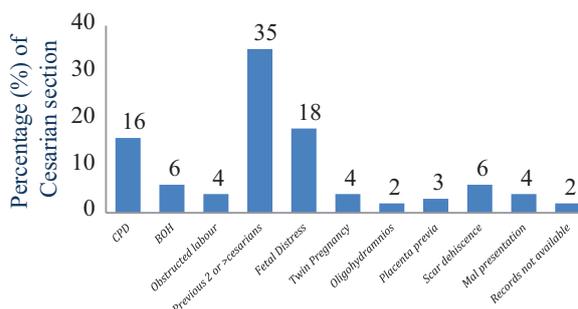
Age group in years	No. of cases n=100	
	Booked n=66	Unbooked N=44
18–23	28	22
>23–28	34	14
>28–32	4	2

Table-2: Age wise distribution of cases based on booked and unbooked



CPD, Cephalo pelvic disproportion; BOH, Bad obstetric history

Figure-1: Indications of previous cesarian section (n=100)



CPD, Cephalo pelvic disproportion; BOH, Bad obstetric history

Figure-2: Indication for present cesarian section (n=100)

in women who had one previous cesarian section. The old postulate: “Once cesarian, always cesarian” leads to repeated Cesarian sections in women who have had previous cesarian section. In our study, previous cesarian section was the leading indication (35%) for subsequent cesarian section in this study and was the main reason recorded for more than one third of cases. Also this study showed that previous cesarian section had frequent incidence of fetal distress, cephalo pelvic disproportion, bad obstetric history and scar dehiscence which resulted in repeat cesarian sections.

Previous two or more cesarian sections were the main indications in our study for repeat Cesarian sections. May be reluctant to give a trial of vaginal delivery after two cesarian sections due to the fear of uterine rupture and associated risk to the mother, and the foetus. The studies conducted by Molison et al., in 2005⁵ and Kenner et al., in 2007⁶ in the western world have shown that women those who delivered previous birth by cesarian sections were less likely to choose to have a subsequent pregnancy (66.9%) compared with those having

spontaneous vaginal delivery (73.9%) and instrumental vaginal delivery (71.6%), and they more likely to have problems like antepartum haemorrhage, preterm or prolonged labour, morbidly adherent placenta, and the risk of malpresentation or an ectopic eventuality in their next pregnancy.^{5,6}

The study conducted by Raksha Arora et al.⁷, in 1982 have shown the cephalo pelvic disproportion rate of almost 44.6% (n=336) which is very less in our study (16%). This high rate of cephalo pelvic disproportion in Raksha Arora et al.⁷, in 1982 with the current study conducted in 2011 reflects changing trends of delivery over the last two decades. These trends may be related women better socioeconomic status and education, improved healthcare setup, accessibility of skilled health professionals.

Foetal distress accounted for 18% and was the second commonest indication for cesarian sections in this study; this situation arises often due to the emergency to save the new born. Similar trend was observed by Pradip Sambrey et al.⁸, in 1992 and Anuradha et al.⁹, in 1996, where they reported rate of incidence 26.9% and 35.25%, respectively. Besides, 31% of our patients had other reasons for repeat cesarian sections indications which are due to Bad obstetric history, obstructed labour, twin pregnancy, oligohydramnios, placenta previa, scar dehiscence, malpresentation and unknown reasons. The rise in cesarian sections rate reflects changing trends of delivery because of change in socioeconomic status, some prefer cesarian sections delivery as an elective procedure, better skilled health professionals with best healthcare infrastructure and fear of litigation healthcare professionals.

CONCLUSIONS

The most common clinical entity for cesarian section is of previous cesarian section and followed by cephalo pelvic disproportion. This has created a common clinical entity of 'previous cesarian section'. In subsequent pregnancy giving high risk pregnant status to the reference pregnancy.

This high risk cases are managed as emergency section as the against the ideal for than the elective cesarian section. Cases of primary cesarian section should be educated about need of ante-natal care. Need of last few visits to a tertiary level centre in order to decide the mode of delivery to undergo elective or emergency section in a centre both between equipped and manual. These estimates could be useful for precise counseling of patients and for clinical decision making prior to recommending primary cesarian section.

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Impact of Disability, Workplace Stress and Other Associated Factors on Quality of Life among Nurses with Non-Specific Low Back Ache in Dehradun

Tulika Rai, Vivek Chauhan

ABSTRACT

Introduction: Non-specific low back pain is defined as low back pain not attributable to recognizable known specific pathology (infection, tumor, osteoporosis, fracture, structural deformity, inflammatory disorder, radicular syndrome or cauda equina syndrome). Nursing the biggest health care profession is globally dominated by female population. Nursing care also includes guiding the patients to prevent illness through hygienic living and helping him to use the available community resources for the same. Nurses stand for long periods of time and perform repetitive lifting and patients transfer that are associated with low back pain.

Materials and Methods: A total number of 100 subjects (females) have participated in the study. These subjects were the working nurses from private hospitals, government hospitals and various nursing homes in and around Dehradun.

Results: Correlation of data between WPSS & WHOQOL given statistically significant value, Workplace Stress & Disability given statistically significant value, WHOQOL & Disability given statistically non significant value.

Conclusion: Present study aimed to evaluate the impact of disability due to nonspecific low back pain along with workplace stress and other associated factors on Quality of Life among nurses as related to age, height, weight using questionnaire survey and interview based evaluation method. The study indicated that large numbers of nurses of Dehradun were affected due to low back pain.

Keywords: Low Back Pain, Quality of Life, Work Place Stress, Disability

INTRODUCTION

Nonspecific low back pain is defined as low back pain not attributable to recognizable known specific pathology (infection, tumor, osteoporosis, fractures, inflammatory disorder and cauda equina syndrome). It has become a major public health problem worldwide. The prevalence of low back pain is reported to be as high as 84% and the prevalence of chronic low back pain is about 23% with 11-12% of the population being disabled by low back pain.¹

Nursing the biggest health care profession is globally dominated by female population. Today nursing is not limited to just delivering expert physical care to the sick but also involves helping the patient to adjust to unalterable situations

such as personnel family and economic conditions, teaching him and others at home and community to take care of one another. Nursing care also includes guiding the patients to prevent illness through hygienic living and helping him to use the available community resources for the same.²

In the hospital environment nurses are known to be a high risk group because of patient lifting and other postural requirements of their job. An estimated 12% of nurses leave the profession annually because of back injuries and over half of them complain of chronic back pain, lifting and moving patients manually has been identified as a high risk activity.

One study showed that 18% of nursing personnel stopped working because of low back pain.³

Epidemiological studies show that work related risk factors such as lifting, twisting, bending, exposure to whole body vibration and prolonged postures play prominent roles.⁴ Nurses stand for long periods of time and perform repetitive lifting and patients transfer that are associated with low back pain.⁵ It is generally accepted that nursing staff belong to the group of high risk professions with regard to the occurrence of musculoskeletal injuries especially in the area of the lumbar spine. The Health related quality of life in nurses is closely related to their physical and mental well beings. Their Health related quality of life may directly or indirectly affect the quality and safety of medical service and finally influence the health of the population at large. Occupational stress in the absence of adequate coping resources can lead to severe mental or physical illness and finally to a decrease in health related quality of life.¹⁰

MATERIAL AND METHOD

A Total number of 100 subjects (females) have participated in the study. These subjects were the working nurses from

MPT (Musculoskeletal), HNB Garhwal University, Srinagar, India

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private hospitals, government hospitals and various nursing homes in and around Dehradun.

Inclusion criteria

Nurses included if they were currently working for a period of at least 1 year in hospital, only females nurses were included and low back pain since 1 week.

Exclusion criteria

Previous history of back surgery, spinal deformities, malignancy, osteoporosis, multiple sclerosis, pregnancy and medications

Outcome measures

World Health Organization Quality of life, Oswestry Disability index and Work place Stress.

World Health Organization Quality of life was designed for the assessment of quality of life. And Here the responses obtained was divided into 4 domains representing physical, psychological, social relationship and environmental. Each domain has its individual transformed score range from 0-100 and as we approach towards the 100 on scale the quality of life improves.

The Oswestry disability was developed to measure disability in people with low back pain.

Scores ranging from 0-20% were claimed to indicate minimal disability, 20-40%-moderate disability, 40-60%severe disability 60-80%crippled and 80-100%bedbound or exaggerating.

Workplace Stress was developed to measure stress level in people with low back pain.

Total score of 15 or lower (33%)-stress isn't much of an issue.

Total score 16-20(35%)-Fairly low

Total score 21-25(21%)-Moderate stress

Total score 26-30(9%)-Severe

Total score 31-40(2%)-Stress level is potentially dangerous.

Procedure

Nordic pain Questionnaire was taken and subjects were explained with the procedure to fill the questionnaire and low back pain nurses were identified. Based on inclusion and exclusion criteria different scales were used as Oswestry Disability Index which was used to measure disability in people with low back pain, World Health Organization Of Quality Of Life for the assessment of quality of life, Nordic musculoskeletal questionnaire for the musculoskeletal disorders in ergonomic context and Work Place Stress Questionnaire to measure stress level.

STATISTICAL ANALYSIS

Data analysis was done using SPSS 16.0 version. Descriptive analysis was done to calculate the mean for age, weight

and height of subjects. Independent T-test was done to compare ODQ, QOL and WPSS and statistical significant level was set at <0.05.

RESULT

The mean of AGE, BMI, OLBPDQ, WPSS, and WHOQOL was found to be 29.930±7.64, 22.453±5.26, 7.02±5.57, 27.280±8.852 and 85.450±6.296 respectively. Low Back Ache was assessed by NMPQ. The scores were correlated between OLBPDQ, WPSS and WHOQOL. Correlation of data between WPSS &WHOQOL Given statistically value $p=.037$. Workplace Stress &Disability given statistically significant value $p=.016$. WHOQOL &Disability given statistically non-significant value $p=.573$

DISCUSSION

Fradlos E. et al described in his study nursing profession is consider to be one from the harder professions globally and is characterized by great workloads, fast pace and intensity of work. According to researchers so far burnout does not occur in the shorthorns, but gradually escalating, thereby creating long term problems, such as feeling of hopelessness, distress, and failure to work requirements, which have an impact on all areas of human life.²

Quality of life is considered to be related to attaining a healthy and productive lifestyle and therefore, have been an investigated parameter in many studies. WHO Denies quality of life as individuals perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns. It is a broad ranging concept affected in a complex way by the person's physical health, psychological state.^{2,3} According to Nisha J. et al. studies on the association between occupational risk factors and low back pain are ham-

	Mean	SD
Age	29.930	7.64788
BMI	22.453	5.26970

Table-1.1: Demographic Data

	Mean	Std Deviation	N
OLBPDQ	7.0200	5.57407	100
WPSS	27.280	8.85242	100
WHOQOL	85.450	6.29634	100

Table-1.2: Descriptive Statistics of OLBPDQ, WPSS & WHO-QOL

	N	Minimum	Maximum	Mean	SD
Age	100	21.00	59.00	29.930	7.64788
BMI	100	9.75	48.24	22.453	5.26970
Valid N	100				

Table-1.3: Descriptive Statistics of AGE & BMI

pered by the difficulties of measuring specific exposures. Many studies are limited by the absence of more quantitative measurements of manual material handling task parameters, and risk of low back injury may be entirely a result of the design of the work- place as opposed to individual differences among the workers. Self-reported questionnaire-based assessments tend to overestimate physical load on the back from bending and lifting compared with hourly self-reported logs of the same activities.⁶⁻⁷ The relative timing of the onset of low back pain and work exposure is also often uncertain. The healthy worker effect (workers with back pain leave a job, resulting in a surviving workforce with healthier backs) may introduce significant bias. Work place factors, including physical and psychosocial factors and their interaction, are strong determinants of back pain. Psychosocial risk factors at work (perceived high pressure on time and workload, low job control, job dissatisfaction, monotonous work and low support from coworkers and management) appear to independently increase the risk of hospitalization for back disorders, with a 3.2-fold increase in a low-control job compared with a high-control job.¹⁰⁻¹⁵

According to Shaher H. Hamaideh there are numerous sources of occupational stress among nurses, in particular. Occupational stressors among mental health nurses are varied; some of these stressors may be related to personal issues, while some of them may be related to workplace and service user issues. These stressors include: increased workload and administration, lack of time management, inappropriate referrals, role conflict and ambiguity, safety issues, lack of supervision, not having enough time for personal study, low general working conditions, lack of social support from colleagues and supervisors, and reduced advancement opportunities (Jenkins & Elliott, 2004). Occupational stress in mental health nursing can have an effect on the physical and psychological health of nurses who work in mental health settings. High stress level can lead to severe clinical distress, Psychomatic illness, and reduced service provision and burnout, increased absenteeism and turnover, and reduced quality of life. Occupational stress leads to emotional exhaustion, including symptoms such as feeling of depression, hopelessness, and helplessness. According to Julia Smedley et al. of the occupational activities but studied, manually moving patients around on the bed, transferring patients between bed and Chair and lifting patients up from the floor were associated with increased risk of back pain, and the associations persisted after adjustment for height and report of non-musculoskeletal symptoms.¹⁰⁻¹⁵ In contrast, no association was found with lifting or transferring patients with a hoist or with canvas and poles. In general, this pattern of risk is consistent with biomechanical evaluation.¹⁵

FUTURE RESEARCH AND LIMITATIONS

The future study can also be done by dividing the groups on

the basis of wards, ICU, same workplace environments and different working areas. Also the study can be done on male subjects. And also it can be done by taking large sample size and specific age group.

CONCLUSION

The conclusion of the study revealed the impact of disability occurred due to non specific low back pain on workplace stress and other associated factors on quality of life among nurses as related to age, height, weight using questionnaire survey and interview based evaluation method.

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Study of Vitamin –D Levels in Urban Population

Sujatha Pasula¹, S Hari Priya², Boppishetti Raja Adithya²

ABSTRACT

Introduction: Vitamin D deficiency is considered to contribute to bone loss and muscle weakness, thus leading to fractures. The objective of the present study was to analyze serum vitamin D levels.

Materials and methods: The study group was comprised of urban population with 640 women and 537 men whose age range was 18- 78years. Renal and liver diseases, diabetes mellitus and other endocrinal disorders were excluded. Further exclusion criteria included the use of medication known to interfere with calcium metabolism and participants must not have been users of any hormones in the previous 1 year.

Results: In the studied subjects Vitamin D insufficiency was found to be 54% in women and 50% in men. Among women subjects in the age group 59-78 years, the proportion was more which amounted to 63%.

Conclusion: Vitamin D deficiency is a public health issue in urban population. Risk and benefits of preventive actions need to be examined in further studies.

Keywords: Vitamin D, urban population, osteoporosis, food fortification.

INTRODUCTION

Indians have vast diversity in traditional, cultural, social and lingual aspects. India is a tropical country extending from 8.4° N latitude to 37.6° N latitude near to equator where ample sunlight is available throughout the year. Hence there was a misbelief that Vitamin D (Vit-D) deficiency is uncommon in India.¹ However Vit D deficiency in all the age groups and both sexes across the country is common finding and has wide range of previous publications.² Serum levels decline with age earlier in women than in men.³ Depending on reproductive and Postmenopausal age groups Vitamin D status is affected.

Vitamin D is a sterol that has a hormone like function. The active molecule 1,25-dihydroxycholecalciferol binds to intracellular receptor proteins. The 1, 25-dihydroxy D₃ receptor complex interacts with DNA in the nucleus of target cells. This either selectively stimulates gene expression or specifically represses gene transcription. Common genetic variants of the vitamin D binding protein (DBP) can predict differences in response of serum 25-hydroxyvitamin D [25(OH)] to vitamin D supplementation.⁴

Vit D is a fat soluble vitamin. Multiple factors like geographical area, pollution, clothing, skin pigmentation and duration and time of exposure to sunlight affect its synthesis

in the body.⁵ Physiological production of Vit D is endogenously in the dermis and epidermis of exposed parts of body from 7-dehydrocholesterol an intermediate in cholesterol synthesis, is converted to cholecalciferol. Calcium-Vitamin D-Parathyroid hormone endocrine axis is responsible for maintaining homeostasis of calcium. Most prominent action of 1,25-dihydroxy D₃ are to regulate the plasma levels of calcium and phosphorous.⁶ Vitamin D inadequacy during adolescence leads to increase in the risk of osteoporosis later in life.⁷ Vit D deficiency and low calcium intake are important risk factors in preventing osteoporosis.⁸ There is widespread prevalence of Vit D deficiency with low dietary calcium intake in Indian population according to various studies published earlier. The hypovitaminosis D group has two subgroups: insufficiency (serum levels between 10 and 29 ng/ml) and deficiency (levels <10 ng/ml).⁹ Vit D deficiency is a common problem in India due to several factors: like food fads and food habits, high fiber diet containing phosphates and phytates which can deplete Vit D stores, genetic factors, number of hours spent indoor have increased in the urban Indians, increased pollution and last but not least the cultural and traditional habits prevalent in certain religions. From the aforesaid reasons, the present study was conducted to study vitamin D deficiency in urban population.

Materials and methods:

The study group was comprised of urban population with 640 women and 537 men whose age range was 18- 78years. Basic information like age, weight, life style habits, hypertension were taken from the individuals by questionnaire. Written consent was obtained from subjects. The study was approved by the ethical committee of the institution.

Exclusion Criteria: H/O of Diabetes mellitus, renal and liver diseases, trauma, endocrinal disorders and vitamin D supplementation. Further exclusion criteria included the use of medication known to interfere with calcium metabolism, users of testosterone, anabolic steroids, glucocorticoids, or bisphosphonates in the previous 1 year. Also pregnant women /

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		Age groups (years)					
		19-28	29-38	39-48	49-58	59-68	69-78
Women							
N		150	123	107	98	75	87
mean Vit-D(S.D)		32(8.9)	30 (7.7)	27(7.2)	26(5.4)	22(4.8)	20(3.2)
deficiency(%)		9	12	12	13	18	20
insufficiency(%)		41	45	47	55	65	69
Men							
N		101	61	97	116	100	68
mean Vit-D(S.D)		32(8.7)	30(7.4)	28(7.9)	27(5.4)	24(5.1)	22(3.4)
deficiency(%)		10	12	11	13	17	18
insufficiency(%)		40	44	45	50	58	59

Table-1: Vitamin D status by sex and age

immuno-compromised patients have been excluded. Blood was collected in vacutainers and estimated for vitamin –D. Investigations like blood sugar, blood urea, serum creatinine, bilirubin, ALT and serum electrolytes were done to rule out Diabetes Mellitus, Liver and Renal diseases. Vitamin –D was estimated with Immuno Diagnostic systems by ELISA method using ELISA reader at 505nm.Kit was calibrated and also controls were run with every batch.

STATISTICAL ANALYSIS

The data was analysed by using SPSS v20 version and Microsoft Excel software.

RESULTS

Cut off values were set according to the kit insert provided with the kit. The descriptive data was analyzed by 10-year age bands to calculate age-specific mean, prevalence of vitamin D deficiency and insufficiency.

In the study 54% of women and 50% of men had vitamin D levels below 29 ng/ml i.e insufficiency. Among 65-79 year-old women, the proportion amounted to 63%.

Over all 52% of subjects studied had insufficiency.

Deficiency in women is 14% and in men it is about 13.5% which is approximately

Trendline descent seen with increase in age.

From figures 2 and 3 it is evident that vitamin D levels decreased with increase in age.

DISCUSSION

Vit D deficiency is not only a problem in India. It is seen even in other tropical countries also.¹⁰ Although, there is sufficient sunshine in India, we are still lacking in preventing it. Overall results of various studies conducted to date in urban and rural India indicate that widely prevalent vitamin –D deficiency is functionally relevant to skeletal health including osteomalacia and rickets.²⁰ In the present study we have taken the vitamin D levels in women and men who are healthy. From the statistical evaluation (table -1) Vit D deficiency in females is 14% and insufficiency is 54% were as in

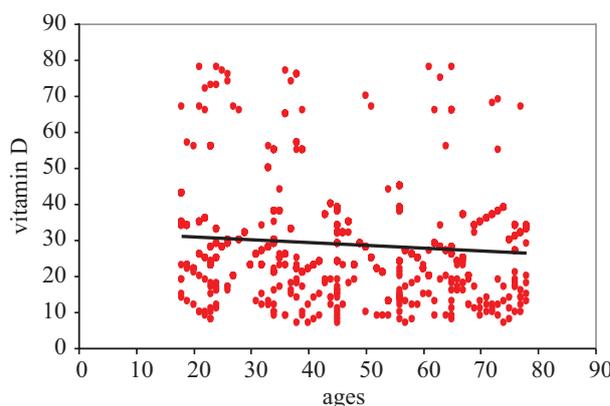


Figure-1: Correlation between vitamin D and ages.

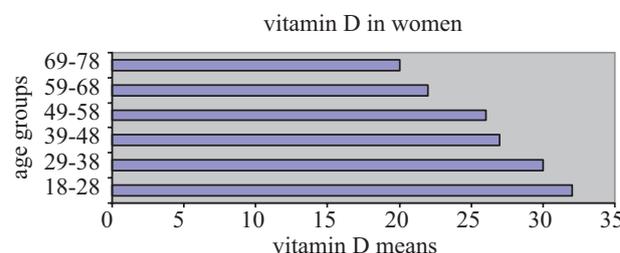


Figure-2: Bar diagram representing vitamin-D means of age groups in females

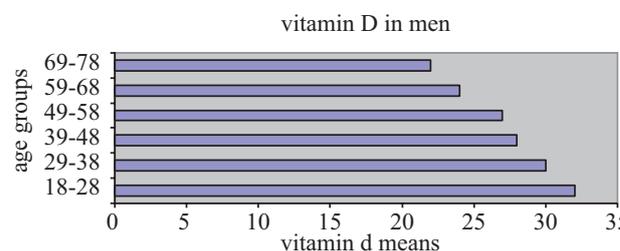


Figure-3: Bar diagram representing vitamin-D means of age groups in males

men deficiency is 13.5% and insufficiency is 50%. It is observed that women of age group of 59 -78 have insufficiency of 63% which is in correlation with study of Riggs et.al.^{11,12} Vitamin D levels are inversely proportional with age in both women and men as shown in figures 2 and 3. This shows the amount of sunshine people are exposed to in the daytime is insufficient because of change in life style in the present

scenario. So there are decreased levels of vitamin D in urban population.

This study is in correlation with Tuohimaa. P et al who stated that older people who are at increased risk of vitamin D insufficiency are about 63% of total population, so they need to spend more time outdoors.¹³ However, older people also have lowered capacity to synthesize vitamin D when exposed to sunlight, so it is difficult for them to meet their requirements via sun light.¹⁴ Vit D insufficiency and deficiency are easily preventable.^{15,16} As the famous saying goes “Prevention is better than cure” Vit D deficiency also should better be prevented than leaving it towards cure. Food fortification with Vit D is a good option in solving this issue. Similarly food fortification and public health policies for Vit D supplementation and mineral requirement is needed.^{17,18} In view of all the above findings, some of the recommendations¹⁹ to decrease prevalence of hypovitaminosis D are -

1. Screening for vitamin D deficiency in individuals at risk for deficiency,
2. Infants and children aged 0 –1 yr require at least 400 IU/d (IU = 25 ng) of vitamin D and children 1 yr and older require at least 600 IU/d to maximize bone health, 3. Adults aged 19–50 yr require at least 600 IU/d of vitamin D to maximize bone health and muscle function,
4. All adults aged 50–70 and 70+ yr require at least 600 and 800 IU/d, respectively, of vitamin D to maximize bone health and muscle function,
5. Pregnant and lactating women require at least 600 IU/d of vitamin D and recognize that at least 1500–2000 IU/d of vitamin D may be needed to maintain a blood level of 25(OH)D above 30 ng/ml, children and adults on anticonvulsant medications, glucocorticoids, antifungals such as ketoconazole, and medications for AIDS be given at least two to three times more vitamin D for their age group to satisfy their body’s vitamin D requirement

CONCLUSION

The deficiency of vitamin D is highly prevalent in urban healthy adult population. More subjects in all age groups in both genders in urban and rural subjects in different parts of the country should be studied in future. Still, this study clearly brings forth the low dietary calcium intake of both the urban and rural subjects, high phytate content of the rural diet and the limited exposure of the urban adults and children to sunlight.

The administration of vitamin D, which also needs trials of longer duration of treatment, to evaluate the effect of different lifestyle factors in this population.

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Clinical Presentations and Risk Factors of Malignant Otitis Externa in a Tertiary Care Hospital

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ABSTRACT

Introduction: Malignant otitis externa (MOE) is one of the aggressive infections involving the external auditory canal, temporal bone and extending to skull base. A descriptive study was conducted to find out the clinical presentations and risk factors of MOE.

Materials and Methods: Sixteen patients with clinical presentations of MOE (age ranges from 40-79 years) were included in the study. Clinical presentations such as nocturnal ear pain, ear discharge, cranial nerve palsy, EAC stenosis, granulation and polyp were examined in all patients. Ear swab culture was done in patients with ear discharge. Detailed history for diabetic patients was taken using questionnaire. The prevalence and clinical presentations were subjected to statistical analysis.

Results: Results showed that male patients were dominant with mean age of 55 years. Only 2 Female patients were found. Bacterial infection by *Pseudomonas* was the major causative agent for the ear infection and the associated pain. All the patients had type 2 diabetes with duration of 5.25 ± 1.8 years in 40-59 age group which was significantly different ($p < 0.01$) from that of the 60-79 years age group (10.25 ± 2.5 years).

Conclusion: The result concluded that duration of diabetes was positively correlated with the incidence of MOE. Diabetes along with bacterial infection of ear was the major causative etiology for the incidence of MOE. A strict control of diabetes and ear swabs culture should be ensured in all patients with clinical presentation of MOE.

Keywords: Malignant otitis externa; Diabetes mellitus; Immuno compromised; *Pseudomonas*; *Aspergillus*

treatment mainly aims at strict control of diabetes and control of infection with the proper antibiotic and debridement if necessary.³

The term 'MOE' was coined by Chandler in 1968.⁴ Disease starts from the external auditory canal. It initially causes cellulitis, which then spreads and results in chondritis, perioritis, osteitis and finally osteomyelitis. Infection can spread through the fissures of Santorini and defects in the floor of the external auditory canal. *Pseudomonas aeruginosa* is responsible in 95 percent of cases. The rest 5% comprised of *Aspergillus*, other gram positive and gram negative organisms.⁵ Nocturnal ear pain, granulations, otorrhoea and resistance to local therapy were reported as the common clinical features. Studies on the clinical presentation of patients were not yet been reported from this region. Therefore, this study is aimed to assess the various clinical presentation and risk factors of patients with MOE in order to help in early diagnosis and prompt management. Further, the result may help to create awareness among the people so as to reduce the morbidity and mortality.

MATERIAL AND METHOD

This descriptive study included patients with clinical suspicion of MOE who had presented to ENT department, Amala Institute of Medical Sciences, during the study period of 12 months were included. Patients with previous history of MOE on follow-up and patients who underwent surgery to rule out malignancy for MEO were excluded. A detailed history had taken by direct interview with the patient or patients' relatives in cases of diabetic patients. The diagnosis was confirmed with contrast computerized tomogram of the temporal bone. Consent was obtained from the patient or their relatives and the study design was approved by the Institutional ethics committee for research, Amala Institute of Medical Sciences. Ear swabs were taken for the culture and

INTRODUCTION

Malignant otitis externa (MOE) is a rapidly progressing and aggressive infection of the soft tissues of the external ear. It is potentially fatal and spreads easily to surrounding structures like periosteum and skull base and is also named as skull base osteomyelitis, necrotizing external otitis.¹ MOE is a misnomer as it is a benign yet life threatening condition.² Most commonly affected individuals are belonging to diabetics and patients in an immune compromised state. Infection is preceded by self manipulation of external ear or self inflicted trauma usually associated with ear cleaning. MOE is a serious disease associated with cranial nerve complications and high rate of morbidity as well as mortality. The

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Age	Diabetes mellitus (n = 16)		Diabetes without immune- compromised conditions (n = 12)	Diabetes with immune- compromised conditions (n= 4)		
	Duration (Yrs)	FSG (mg/dl)		Drugs	HIV	Others
40-59	5.25 ± 1.8	207.75 ± 29.02	6	1	1	1
60-79	10.25 ± 6.7*	182.0 ± 24.79 ^{NS}	8	Nil	Nil	1

* p < 0.01 (Student t test) significantly and NS non-significantly different from each other. FSG: Fasting serum glucose.

Table-1: Distribution of risk factors for malignant otitis externa

sensitivity analysis. The duration and fasting serum glucose (FSG) level were subjected to statistical analysis. Informed written consent was obtained from the patients and the study design was approved by the Institutional Ethics committee.

STATISTICAL ANALYSIS

The statistical analysis was performed using SPSS (version 16.0). Student t test was applied to find the significant difference in the duration of diabetes and FSG between the groups. P less than 0.05 was considered as significant

RESULTS

Only sixteen patients of age ranges from 40-79 were enrolled in the study with male dominance of 87.5 % were noticed. Only 2 females presented with MEO during the one year of study (Fig 1). The prevalence was found in the age group of 60-79 years (Fig 2). All the patients were undergoing treatment for diabetes. Among them 81.25 % patients were without any immune compromised state, where as 18.75% were with immune compromised state. The multiple reasons including using steroid drug (1 case) and 2 with chronic kidney disease (CKD) were found as the risk factors for the immune compromised state (Table 1).

Among the clinical presentations, nocturnal ear pain and ear discharge was found to be prevalent (Table 1). All patients with MEO had nocturnal ear pain and ear discharge. Cranial nerve palsy was observed as the least clinical presentation (31.2%). Ear swab culture and sensitivity test indicated *Pseudomonas aeruginosa* in 68.75% cases and *Aspergillus* infection in one case. Mixed infection was manifested in 3 cases and one case with *Candida* (Fig 3). Duration of diabetes between the two group studied were found to be significant (p <0.01).

DISCUSSION

Results of the study revealed that all the patients presented with clinical features such as nocturnal ear pain and ear discharge were diabetic. The duration of diabetes has direct association with the incidence of MOE. Furthermore, ear swab culture and sensitivity test indicate *Pseudomonas* as the major organism involved in the ear infection.

Though the MOE was reported as a rare infection of the external ear, it commonly affects elderly individuals who are diabetic or who are in an immune compromised state. In our

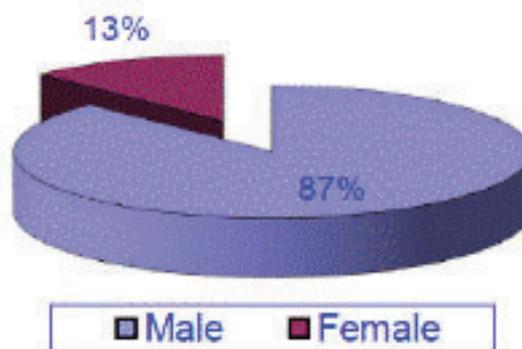


Figure-1: Distribution of age and gender

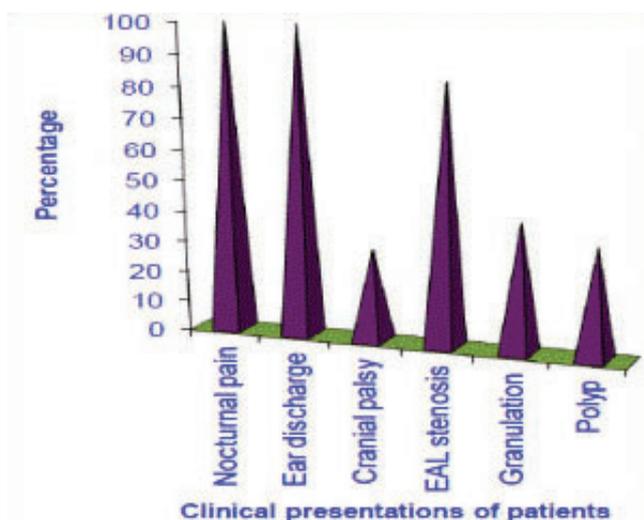


Figure-2: Clinical presentations of malignant otitis externa. EAL: External auditory canal

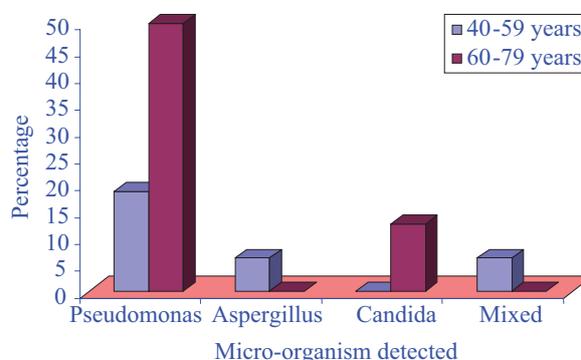


Figure-3: Type of organism detected in ear swab culture

study, all the patients had diabetes. Apart from diabetics, a few of the patients were on systemic steroids and CKD patients on dialysis. It is rapidly progressive and potentially life

threatening disease which can affect temporal bone, skull base and cranial nerves.^{7,9-12} The reason behind this infection affecting mostly elderly and diabetics is proposed to be microangiopathic changes that occur in the small blood vessels of external auditory canal.^{4,8} These changes along with defective function of phagocytes and macrophages can predispose to spread of infection. Infection can spread to temporal bone through the fissures of santorini and tympanomastoid suture involving jugular and stylomastoid foramina. Facial nerve gets most commonly affected because it comes out through the stylomastoid foramen.⁹

Diabetes or other immune compromised state, *Pseudomonas aeruginosa* on culture, a positive bone scan and cranial nerve palsy are confirmatory factors for the diagnosis.¹ Technetium (Tc-99m) radionuclide bone scans are useful in detecting bony involvement.⁶ presence of bone erosions and soft tissue involvement of infratemporal fossa suggested the disease.⁷ Diagnostic clinical features include nocturnal otalgia, otorrhea, external auditory canal oedema and stenosis, presence of granulation or polyp and cranial nerve palsies in later stages were reported.¹⁰ C reactive protein and erythrocyte sedimentation rate were also found to be raised in MOE and with appropriate treatment they will start to decrease within 2 weeks and eventually return to normal. Marzo et al. reported that *P. aeruginosa* is the most common (99.2 %) organism involved in skull-base osteomyelitis. *Aspergillus* and *candida* are very rarely reported.¹¹

In our study, we found only one case with cranial nerve palsy. This has been ascribed to the inflammation occurring along the skull base as the disease progresses as well as due to the neurotoxins from pseudomonas. Lling et al. reported that during the disease progression, the facial nerve is the most common and first cranial nerve involved at the stylomastoid foramen.¹² They reported 40% incidence of facial nerve palsies and 24% incidence of multiple cranial nerve palsies in patients with MOE.

Unusual presentation of MOE include involvement of temporomandibular joint and destruction of condyle of mandible as suggested by Ebenezer et al.¹³ Squamous cell carcinoma and MOE have the clinical features in common. None of our patients in this study had malignancy. Biopsy of the granulation tissue in such cases is mandatory to rule out malignancy. Sometimes malignancy and MOE may coexist making the diagnosis more difficult.^{14,15}

Treatment mainly is medical with antipseudomonal antibiotics like flouoroquinolones and surgical debridement is needed in extensive disease.¹⁶ Third generation cephalosporins were also found to be useful in controlling infection. Daily debridement and topical application of acetic acid drops helps in fighting the infection. Therefore, ear swabs are essential to guide the choice of antimicrobial therapy and should ideally be taken prior to commencing antibiotics, either topical or systemic. Cranial nerve palsies increase the mortality and morbidity. The infection of the external ear is rare which may probably explain the less number of cases found in this

study. Hence, a multicentre large group study is warranted to establish the association of clinical features and risk factors of MOE.

CONCLUSION

Diabetes mellitus was the major risk factor observed in this study with clinical presentation of ear infection and ear discharge. Clinical suspicion can help in early diagnosis and prompt management thus helping in reducing the mortality and morbidity associated with this disease. A strict control of diabetes and ear swabs culture should be ensured in all patients with clinical presentation of MOE.

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Evaluation of Fractures of Distal Radius Treated with Joshi's External Stabilization System and Plaster Cast Application

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ABSTRACT

Introduction: Pattern of distal radius fractures varies from very simple extra articular to complex intra articular fracture and it has been treated by different methods varying from closed reduction with plaster to open reduction with internal fixation leading to variable prognosis. This study was done to assess functional and radiological outcome of JESS application and plaster cast in treatment of distal radius fracture.

Materials and methods: 56 patients of distal radius of AO type A, B and C were included in this study. Out of which 19 patients were treated with closed reduction by ligamentotaxis with JESS application and others with closed reduction and above elbow pop cast applied under image intensifier. Follow up was done at 3,6,12 and 20 weeks and functional scoring was done using modified Gartland and Werley Score. Data was statistically analyzed using SPSS version 17.

Results: Functional scoring in fixator group was 93.42 ± 6.62 and in plaster group was 88.64 ± 6.78 ($p = .01$). At 12 weeks radial length 12.05 ± 4.30 mm in fixator group as compare to plaster group was 9.11 ± 3.52 mm was statistically significant ($p = .004$). Ulnar variance in fixator group was -0.37 ± 1.81 as compare to plaster group having 0.56 ± 1.81 ($p = .04$) found significant deference. Superficial pin tract infection (4 cases) and loosening of pin (2 cases) found in 2 patients. Stiffness of fingers was common complication in plaster group.

Conclusion: To maintain radial length and ulnar variance JESS is a cost effective technique in treatment of distal radial fracture as compare to plaster cast.

Keyword: Distal radius fracture, JESS application, Radial length.

distal radial fractures treated by POP cast and closed reduction and external fixation by JESS.

MATERIAL AND METHODS

This study was carried in department of Orthopaedics, King George's Medical University, Lucknow from June 2012 to May 2014. We enrolled 56 closed distal radius fracture AO type A, B and C in age group of more than 18 years. Patient were excluded if they had open fracture, poly trauma patients, infection and prior surgery. Importance and relevance of study was explained to all patients. Those who were willing to participate were included in study. Study was approved by ethical committee. Out of 56, 19 patients had given consent for surgery and treated with closed reduction by ligamentotaxis and application of JESS under brachial plexus block/general anaesthesia by putting two Schanz pins in radius and base of 1st metacarpal and connected with rod. Rest of all (37 patients) were treated with closed reduction by ligamentotaxis and above elbow POP cast under fracture hematoma block under image intensifier.

Post operative and post reduction X-ray of wrist- Antero-posterior, Lateral views were done to assess the fracture reduction. Post operative i.v. antibiotics given for 3 days and oral antibiotics for 5 days. Further follow up done at 3, 6, 12 and 20 weeks. Post operatively limb kept elevated and active and passive finger movement allowed. Fixator and POP cast was kept for 6-8 weeks according to callus formation. Assessment was done objectively, radiologically and for any complication. Objective assessment included clinical and physical examination of affected limb along with range of movement. Radiologically we assessed Radial length, Radial

INTRODUCTION

Distal radius fracture is a common fracture in upper extremity^{1,2} and treatment modalities for this fracture have evolved over a long period of time from pop cast, k wire fixation, external fixation and open reduction internal fixation by plates. Most of the fractures have been treated with close reduction and POP cast. Although it is a simple mode of treatment but leads to loss of reduction and residual deformity.³ External fixation of these fractures is required to maintain the reduction.^{4,5} JESS is a kind of external fixator and has been used for other fractures and it is easy to apply, cost effective, less cumbersome.^{6,7} Basic principle used in external fixator is ligamentotaxis.^{8,9} This study was done to evaluate the results of

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angle, Volar tilt and Ulnar variance in both groups. The functional outcome score measured on the criteria of modified Gartland and Werley Score¹⁰ at last follow up and compared with that of unaffected side. Data were analysed using statistically using SPSS version 17.

RESULTS

Most of the patients in both Fixator (52.6%) and Conservative (37.8%) groups were below 40 years. The mean age of the patients of Fixator group was 33.05 (± 8.47) years and 36.65 (± 13.01) years in Conservative group. Majority of the patients in both Fixator (78.9%) and Conservative groups were males (75.7%) and the difference was statistically insignificant ($p > 0.05$). The most common cause of fracture

distal end radius in our study is Road traffic accidents. Distribution of patients by AO classification is shown in Table 1 and it shows all three type of fracture were treated in both groups

The comparison of patients by functional scoring and range of movement is shown in the Table-2. The patient managed surgically were having better functional outcome and better range of motion and the difference was significant except for flexion at wrist joint which was slightly better in conservative group but the difference was not significant.

The pre-operative comparison of parameters is presented in the Table-3. There was no significant ($p > 0.05$) difference in RL(radial length), RI(radial inclination) and RT (radial tilt) between Fixator and Conservative groups in pre-operative. However, UV(ulnar variance) was significantly ($p = 0.03$) higher among the patients of Fixator (3.42 ± 2.41) than Conservative (1.54 ± 2.91).

The post-operative comparison of parameters is shown in the Table-4. The change from normal side to the post op level shows that attainment of normal radial length in surgical group is much more significant. The collapse in surgical group occurs at late three and six months follow up and that too to minor levels. The collapse in conservative group is more significant at each level of follow up.

At final follow up RL and UV was significantly better in patients treated surgically. is presented in the Table-4/Figure-1. The most common complication in conservative series was finger stiffness. Superficial pin-tract infection occurred in 4 (10.5%) patients in group B, but was resolved with oral antibiotics. Loss of reduced position occurred in 10 patients with POP cast within the first 3 weeks of injury, while there were only 2 cases of loss of reduced position in the other group. Reflex sympathetic dystrophy developed in 1 case of group A and none of group B.

DISCUSSIONS

There was a predilection of involvement of dominant side in our study group. Most of patients were < 40 yrs of age, which is socially productive group and hence need utmost attention for better functional outcome. In our study road traffic accidents were the most common cause of fracture in our study followed by slip on ground. We found that most of the patients in both Fixator (78.0%) and Conservative groups were males (75.7%) this can be due to the difference in life style as males are more exposed to outdoor activities. Majority of

Gender	Groups			
	Fixator (n=19)		Conservative (n=37)	
	No.	%	No.	%
A	6	31.6	22	59.5
B	1	5.3	3	8.1
C	12	63.2	12	32.4

Table-1: Distribution of patients by AO classification

	Groups		p-value ¹
	Fixator (n=19)	Conservative (n=37)	
Functional scoring	93.42 \pm 6.62	88.64 \pm 6.78	0.01*
Range of movement			
Extension	87.28 \pm 9.95	81.85 \pm 6.86	0.02*
Flexion	76.13 \pm 10.84	76.82 \pm 6.78	0.70
Pronation	82.70 \pm 2.08	80.13 \pm 4.82	0.03*
Supination	84.05 \pm 1.68	82.64 \pm 1.65	0.004*

¹Unpaired t-test, *Significant between the groups

Table-2: Comparison of patients by functional scoring and range of movement

	Groups		p-value ¹
	Fixator (n=19)	Conservative (n=37)	
RL	6.05 \pm 6.79	7.76 \pm 4.23	0.25
RI	16.47 \pm 8.89	19.95 \pm 7.89	0.14
RT	-6.37 \pm 20.80	-0.19 \pm 16.74	0.23
UV	3.42 \pm 2.41	1.54 \pm 2.91	0.03*

Table-3: Pre-operative comparisons of parameters

	Groups at post operative		p-value ¹	Groups at 12 week follow up		P value
	Fixator (n=19)	Conservative (n=37)		Fixator (n=19)	Conservative (n=37)	
RL	14.42 \pm 3.59	12.78 \pm 1.98	0.02*	12.05 \pm 4.30	9.11 \pm 3.52	0.004*
RI	25.63 \pm 8.00	26.11 \pm 4.47	0.77	24.63 \pm 8.58	21.35 \pm 6.45	0.11
RT	5.21 \pm 11.01	7.73 \pm 5.46	0.25	1.37 \pm 6.30	2.76 \pm 5.14	0.38
UV	-1.63 \pm 1.30	-0.76 \pm 1.48	0.03*	-0.37 \pm 1.81	0.56 \pm 1.82	0.04*

¹Unpaired t-test, *Significant between the groups

Table-4: The comparison of parameters at immediate postoperative and 12 weeks postoperative

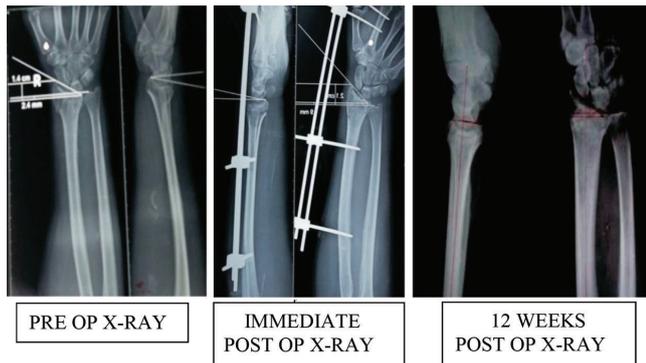


Figure-1: Shows pre-operative, post-operative and 12 weeks post-operative X-ray showing maintainance of radial length and ulnar variance in fixator group.



Figure-2: Showing range of movement at wrist joint after 3 months of JESS application

patients of the fixator were having comminuted fracture of AO type C and majority of patients of AO type A of fracture were treated by conservative method i.e. reduction setting and above elbow pop application.

Our study had shown better functional outcome in the patients treated by external fixator as the study by T.A. Clyburn¹¹ et al. He claimed that external fixator maintained reduction and allowed early functional range of motion of wrist in comminuted radial fracture in 29 patients.

On radiological follow-up the study shows that the Surgical procedure maintains radial length more effectively than POP cast and also retains it till the union better than POP cast and it is supported by N.H. Jenkins¹² et al, they treated 58 patients aged less than 60 years with Colles' fracture, either by a forearm plaster or by the application of an external fixation. The external fixator proved more effective at holding the manipulated position as compared to patients treated with plaster.

We used scoring system by the Gartland and werley and after evaluation we got 68.4% excellent, 15.8% good 15.8% fair results and the conservative group had 21.6% excellent, 56.8% good 16.2% fair and 5.4 %poor results and similarly Joosten U¹³ et al evaluated 174 patients with severely displaced intraarticular fracture treated with bridging external fixator. After evaluating with Gartland and Werley score, they obtained 29.3% excellent, 42.5% good, 10.3% fair and 2.9% poor results.

Radiologically, the patient with surgical treatment were having better attainment of radial length till the union but difference in the dorsal tilt and radial inclination was insignificant in the conservative group and similar results were obtained in various studies^{14,15,16,17}

The complications of the surgical method includes mainly pin tract infection and finger stiffness especially index finger similar to the study by Chan BK et al¹⁸ who used AO external fixator in 30 patients with intra articular fractures of distal radius. After 90.2 weeks of evaluation they found excellent to good result in 65% of cases, but also some complication mainly fingers stiffness, pin tract infection and even loss of reduction.

CONCLUSION

External fixation is a more effective method for the treatment of fractures of the distal radius in term of maintaining radial length, prevent collapse with few complication like superficial pin-tract infection, pin loosening than treated with above elbow plaster of paris. Radial tilt and radial inclination and variance correction were attained by both modes of treatment but due to more collapse in the conservative group, loss of correction was more.

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Double Blind Placebo Controlled Study to Compare the Efficacy of Esmolol and Diltiazem in Attenuation of Pressor Response Due to Laryngoscopy and Endotracheal Intubation in Controlled Hypertensive Surgical Patients

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ABSTRACT

Introduction: Pressor response in the form of tachycardia and hypertension are well documented sequels of laryngoscopy and endotracheal intubation which is transient, highly variable and is generally well tolerated in healthy patients. In hypertensive patients this response is exaggerated. The aim of this study is to find a better alternative by comparing esmolol and diltiazem to attenuate the pressor response to laryngoscopy and intubation.

Material and Methods: One hundred fifty hypertensive patients of either sex (ASA II), controlled on antihypertensive medications in 40-60 Year age range scheduled for routine surgical procedures were divided into 3 groups: Group A (10 ml of 5 % Dextrose), Group B (Esmolol 1.5 mg/Kg) and Group C (Diltiazem 0.2 mg/Kg). Heart rate, systolic blood pressure, diastolic blood pressure, mean arterial blood pressure and rate pressure product were noted at baseline level, at 1 min., 3min. and 5min after tracheal intubation.

Results: When compared to control both esmolol and diltiazem showed a statistically significant attenuation of rise in systolic blood pressure, diastolic blood pressure, mean arterial blood pressure and rate pressure product. However Diltiazem failed to reduce rise in heart rate.

Conclusion: Esmolol was found to be a better agent in attenuating the pressor response to laryngoscopy and intubation in these patients.

Keywords: pressor response, diltiazem, esmolol, intubation, laryngoscopy

ble for exaggerated hemodynamic changes. Arterial lumen narrowing, blunted baro reflex response and increased sympathetic activity.²

Various medications like Calcium channel blockers have been used because myocardial depression produced is minimized by reduction in afterload so that cardiac output remains unchanged, but they have no effect on observed tachycardia.^{3,4} Beta adrenoreceptor blockade minimizes increase in heart rate and myocardial contractility by attenuating the positive chronotropic and inotropic effects of increased adrenergic activity.^{1,5-6} The study was carried out in a Tertiary Care Medical Facility and the aim was to find a better alternative by comparison between Esmolol and Diltiazem to attenuate the pressor response to laryngoscopy and intubation: the response being more so in hypertensive patients.

MATERIALS AND METHODS

One hundred fifty hypertensive patients of either sex with (American Society of Anesthesiologists Physical Status Classification System) ASA II, controlled on antihypertensive drugs, between age range of 40-60 years scheduled for routine surgical procedures under general anesthesia (Open and Laparoscopic Cholecystectomy, Hydated Cystectomy,

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INTRODUCTION

There are many techniques and drugs which have been used for blunting the hemodynamic response to laryngoscopy and intubation. An important factor influencing cardiovascular response to tracheal intubation is age and the cardiovascular response to laryngoscopy and intubation is exaggerated in hypertensive patients.¹ The proposed mechanisms responsi-

Common Bile Duct Exploration, AbdominoPerineal Resection, Thyroidectomy, Mastectomy, Exploratory Laparotomy for Carcinomas of Gut and Pancreas, interval Appendicectomy, Hernioplasty) were enrolled in our study. After proper approval from Institutional Review Board & Ethics Committee an informed consent to participate in the study was taken from all the patients. Patients on treatment with calcium channel blocker or β -blockers, history of bronchial asthma; history of cardiac disease; uncontrolled hypertension; History of allergy to any of the study drugs and patients with predicted difficult intubation were excluded. After taking informed consent, the patients were prepared by overnight fasting and sedation with Alprazolam 0.5 mg given orally at bedtime on the night before surgery.

Patients were continued on antihypertensive therapy till the morning of surgery and three hours before the expected time of surgery every patient was given Alprazolam 0.5 mg with water. The patients were divided into three groups of 50 patients each randomly by simple randomization.

Group A: Comprised of 50 patients who received 10 ml of 5 % dextrose water following intravenous induction. This served as a control group for the present study.

Group B: Comprised of 50 patients who received Injection Esmolol 1.5 mg/kg diluted in 10 ml of 5% dextrose water following intravenous induction.

Group C: Comprised of 50 patients who received Injection Diltiazem 0.2 mg/kg diluted in 10 ml of 5 % dextrose water following intravenous induction.

Just before administration of any drugs, parameters, i.e., heart rate, systolic blood pressure, diastolic blood pressure, mean arterial blood pressure and rate pressure product were noted. In all the patients standardized anaesthesia technique was used. Pre-oxygenation was done in all patients for three minutes, followed by Sodium Thiopentone (5 mg/kg of 2.5 % solution) intravenously until loss of eyelash reflex followed by administration of study drug. Succinylcholine 1.5mg/kg was used to facilitate endotracheal intubation and 90 seconds after administration of Succinylcholine, intubation was performed. Patients in whom more than one attempt of laryngoscopy was required and total duration of laryngoscopy exceeded 30 seconds were excluded from the study. The position of endotracheal tube was confirmed and, anaesthesia was maintained using nitrous oxide and oxygen with volatile anaesthetic agent (Isoflurane 0.2 %) delivered through closed circuit. Bolus dose of Atracurium besylate 0.5 mg / kg intravenous initially for muscle relaxation followed by top up doses to maintain muscle relaxation was used. The residual effect of muscle relaxant was reversed with Neostigmine (2.5 mg) and glycopyrrolate (0.5 mg) at the end of the surgery. After full clinical recovery was achieved and after thorough Oropharyngeal suctioning extubation of trachea was done. Thereafter, patients were shifted to recovery room. The study period extended from the induction of anaesthesia to five minutes after intubation. Surgical stimulus was not allowed during study period. Heart rate, Systolic blood

pressure, Diastolic blood pressure, Mean blood pressure and Rate pressure product (systolic blood pressure x heart rate) were noted at baseline level, after giving study drug, immediately after laryngoscopy and intubation, at 1 minute, 3 minutes and 5 minutes after the tracheal intubation.

STATISTICAL ANALYSIS

All parameters of the study were statistically evaluated by using student's t-test and chi-square test. Power of study and sample size was estimated assuming any p-value less than 0.05 i.e. ($p < 0.05$) was going to be statistically significant.

RESULTS

There was no statistically significant difference between the groups with respect to age and sex (table 1). Baseline heart rates in the three groups and changes in their levels soon after laryngoscopy and intubation was observed and tabulated in (table 2) in all the three groups. In groups A,B and C respectively showing a highly statistical difference on comparison. The rise was significantly attenuated in the Esmolol group. Thereafter when Group C and A were compared, the heart rate in both the groups showed increase after intubation, that was statistically significant ($p < 0.05$) and it persisted upto 5 five minute after intubation. However the rise in heart rate was statistically more significant in Group A when compared with Group C. When heart rate in Group B and Group C were compared, the rise in heart rate was attenuated in Group B while in Group C there was significant ($p < 0.05$) rise in the heart rate.

The systolic blood pressure at baseline was $126.50 + 6.95$ in Group A. A statistically significant rise in systolic blood pressure soon after laryngoscopy and intubation $161.64 + 16.64$ and the increase in systolic blood pressure remained statistically significant till 5 minutes after intubation. The systolic blood pressure (table 3) at baseline were $128.77 + 9.59$ and $132.04 + 10.80$ in Group B and C. The drug B and C successfully attenuated any rise in systolic blood pressure soon after laryngoscopy and intubation $124.76 + 10.24$ and $128.84 + 14.19$ and continued to do so upto 5 min after the intubation $124.94 + 8.36$ and $130.98 + 10.63$ respectively.

Soon after laryngoscopy and intubation diastolic blood pressure (table 4) in Group A showed statistically significant rise from baseline $77.78 + 5.03$ to $105.60 + 18.08$ and remained statistically significantly high upto five minutes after intubation $88.52 + 8.26$. In Group C the diastolic blood pressure showed a fall from baseline $80.55 + 8.27$ to $71.00 + 7.82$ at 3 minutes after intubation. Soon after laryngoscopy and

Groups	Gender female (%)	Age (yo) Mean +SD
Group A n = 50	33 (66%)	52.12+13.75
Group B n = 50	39 (78%)	51.72+14.74
Group C n = 50	36 (72%)	49.74+13.97

Table-1: Distribution of gender and age among groups.

Groups	Basal	After study drug	Laryngoscopy & intubation	1 min after intubation	3 min after intubation	5 min after intubation
Group A Mean + SD	88.62+10.03	88.08+12.72	118.24+14.45	112.52+14.45	104.68+17.83	99.04+3.73
Group B Mean + SD	92.77+13.36	88.96+12.51	92.0+13.071	89.48+13.00	88.84+15.38	84.90+11.89
Group C Mean + SD	92.08+13.808	97.24+15.32	100.94+13.69	102.94+13.691	102.94+14.21	103.57 +13.04

Table-2: Comparison of heart rates between the groups A, B and C

Groups	Basal	After study drug	Laryngoscopy & intubation	1 min after intubation	3 min after intubation	5 min after intubation
Group A Mean + SD	126.50+6.95	123.34+8.49	161.64 +16.64	145.12+23.08	139.10+12.45	133.52+10.03
Group B Mean + SD	128.77+9.59	125.28+12.86	124.76+10.24	125.86+12.17	125.45+10.05	124.96+8.39
Group C Mean + SD	132.04+10.80	129.94+11.79	128.84+14.19	129.95+10.15	130.74+10.21	130.98+10.63

Table-3: Comparison of Systolic Blood Pressure between the groups A, B and C

Groups	Basal	After study drug	Laryngoscopy & intubation	1 min after intubation	3 min after intubation	5 min after intubation
Group A Mean + SD	77.78+5.03	78.84+6.50	105.60 +18.08	100.90+10.71	93.18+9.58	88.52+8.26
Group B Mean + SD	81.28+7.61	79.82 +8.20	80.44+9.79	79.90+7.67	78.35+9.56	80.75+8.27
Group C Mean + SD	80.55+8.27	76.51+8.77	74.28 +9.68	74.28+9.68	71.00+7.82	74.82+9.11

Table-4: Comparison of Diastolic Blood Pressure between the groups A, B and C.

intubation the diastolic blood pressure in Group C was 76.67 + 9.82. In Group B diastolic blood pressure insignificantly changed from baseline 81.28 + 7.61. The diastolic blood pressure was 80.44 + 9.79 soon after laryngoscopy and intubation and 80.75 +8.27 at 5 minute after intubation.

In Group A Rate pressure product rose from baseline, peaking at laryngoscopy and intubation 18966.66 + 3032.22 and at 5 minutes after laryngoscopy and intubation 13202.04 + 2043.80. In Group C when rate pressure product was compared at different intervals with baseline 12235.22 + 2258.24, there was insignificant ($p > 0.05$) difference at laryngoscopy and intubation 12508.28 + 2982.23 and at 5 minutes after intubation 12318.86 + 1678.84. In Group B rate pressure product when compared at different interval with baseline 12027.06 + 2271.43, there was insignificant ($P > 0.05$) difference at different intervals at laryngoscopy and intubation 12521.35 + 2003.04 and at 5 minutes after laryngoscopy and intubation 11824.51 + 1786.00

DISCUSSION

Laryngoscopy and endotracheal intubation are documented cause of tachycardia and hypertension.^{1,7} Cardiovascular response to laryngoscopy and intubation is exaggerated in hypertensive patients.¹ Major determinant of myocardial oxygen consumption is heart rate and there is an increasing evidence that tachycardia is poorly tolerated in patients with coronary artery disease. There is an increased incidence of

myocardial ischemia when intra operative heart rates exceed 110/min.^{8,9}

After intubation in Group B (Esmolol group) there was significant attenuation in rise of heart rate, systolic blood pressure, diastolic blood pressure, mean arterial pressure and rate pressure product as compared to base line values. These findings are consistent with the result of Miller et al.¹⁰ Esmolol is a cardio selective beta blocker with ultra short duration of action and has been indicated for the treatment of tachycardia and hypertension during tracheal intubation.¹¹ In the Esmolol group we observed that the increase in heart rate after laryngoscopy and intubation were significantly attenuated and remained throughout the study period. Multiple studies have shown similar results.^{8,12,13}

In Group C (Diltiazem group) after laryngoscopy and intubation there was a significant rise in heart rate in and remained so throughout study period when compared with the control group.^{14,15} A significant attenuation by group was seen on comparison of Esmolol and Diltiazem and a similar study by Kumar Santoshet al also concluded with the same results.¹³

Systolic blood pressure rose significantly in the control group following laryngoscopy and intubation and remained high thereafter for five minutes following intubation. Esmolol and Diltiazem successfully attenuated the rise in SBP and on comparison showed a statistically significant difference with the control group. These findings were similar to those of the Mikawa and Fuji.¹⁵⁻¹⁶

Similarly diastolic blood pressure showed a significant rise during laryngoscopy and intubation in group A and persisted upto 5 min. as compared to group B and C when diastolic blood pressure and mean arterial pressure were observed during study period. The rise in diastolic blood pressure was attenuated in Group B while in Group C the diastolic blood pressure showed falling pattern from administration of drug till 3 minutes and then again, at 5 minutes the diastolic blood pressure showed a rise on comparing Group B and C. In the control group mean arterial pressure rose and persisted for 5 min but both Group B and C attenuated the rise in MAP, more efficiently by Esmolol Group.

Rate pressure product is calculated by multiplying systolic blood pressure with heart rate and is good estimate of myocardial oxygen requirement.¹⁷ Significant ($p < 0.05$) rise from baseline, peaking at laryngoscopy and intubation 18966.66 (+ 3032.22) and at 5 minutes after laryngoscopy and intubation 13202.04 (+ 2043.80) was seen in Group A. When comparing rate pressure product between Group B and Group C, there seemed to have significant differences at respective time intervals, but in both groups the rise in rate pressure product is insignificant.

Menkhaus and Miller also concluded that esmolol is effective in controlling systolic, diastolic and mean arterial pressure following laryngoscopy and intubation.^{10,18,19} Findings in Group C (Diltiazem group) showed significant attenuation in rise in systolic, diastolic and mean arterial pressure when compared with base line. These are consistent with the findings of the Mikawa and Fuji.^{15,16}

On comparing the changes in heart rate, systolic blood pressure, mean arterial pressure and rate pressure product after intubation between Group B (Esmolol) and Group C (Diltiazem) it was found that esmolol attenuated the rise in above mentioned parameters better. These findings are consistent with the findings of Kumar Santosh et al.¹³

CONCLUSION

The esmolol had better attenuating effect of pressor response when compared with diltiazem in the form of alterations in heart rate, systolic blood pressure and rate pressure product when compared between the two study groups. Diltiazem does not prevent rise in the heart rate observed during laryngoscopy and intubation. Hence, esmolol proved to be very effective agent in attenuating the pressor response of laryngoscopy and intubation in controlled hypertensive patients.

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The Relationship Between the Intent to Stay and the Organizational Commitment of Visiting Nurse in Japan

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ABSTRACT

Introduction: Many studies related on the relationship between nurse turnover and their organizational commitment had been conducted. However, it appeared to be no studies related on the relationship between organizational commitment and intent to stay on visiting nurse. This study aimed to explicit the relationship on visiting nurse.

Materials and Methods: This survey targeted public health nurse and nurse, assistant nurse worked as visiting nurse in two prefectures at Tokai area in Japan. Investigation items were age and cumulative years of nursing service, years of service for their current workplace, the presence of intent to stay, organizational commitment scale. This analysis used Wilcoxon signed-rank test and multiple logistic regression.

Results: 192 visiting nurses were analyzed. In the result of the multivariate analysis, OC and age were clarified significant variables. The odds ratio of age and OC were 0.9030($p=0.0030$), 1.0690($p=0.0004$) respectively.

Conclusions: The intent of stay of visiting nurses in current their workplace at 2 prefectures in Japan was significantly related with age and OC of them.

Key words: Visiting Nurses, Nurse Administrators, Nursing Staff, Turnover, Retention, Organizational Commitment, Multiple Logistic Regression

In such situation, it was thought that a disclosing the relationship the presence of intent to stay of female nurse with their children and their organizational commitment gave any suggestions for promotion of nurse retention to visiting nurse administrators.

MATERIALS AND METHODS

Subjects: This survey targeted public health nurse and nurse, assistant nurse worked as visiting nurse in two prefectures at Tokai area in Japan. The inclusion criteria in this study was female nurses with their children, and nursing aide was excluded from subjects of it.

Variables: Investigation items were age and cumulative years of nursing service, years of service for their current workplace (visiting nurse station), the presence of intent to stay (intent to stay / intent to leaving or undecided), organizational commitment scale. The organizational commitment questionnaire (24 items, 4 Likert scale) was developed by Meyer and Allen⁸⁻¹⁰, evaluates one's psychological connection with workplace organization. This scale consists of Affective Commitment and Continuance Commitment, Normative Commitment that had 8 questions with 4 point (0 - 3) Likert respectively. The score of organizational commitment questionnaire (OC) ranges from 0 to 72. The higher the score, the stronger a his/her commitment to current workplace implies. Acceptances of copyrights' owner and the Japanese language version of this scale for use it were received before the investigation.

Age and cumulative years of nursing service, years of service for their current workplace were variables adjusting confounding factor in this analysis. The investigation period were from September 2014 to December 2014. The research was approved by Aichi kiwami college of nursing research ethical committee (Aichi kiwami college of nursing, No

INTRODUCTION

Many studies related on the relationship between nurse turnover and their organizational commitment had been conducted. Most of these suggested a significant relevance. However, it seemed that subjects in these studies were not visiting nurses but ones working in hospital.¹⁻⁵

In Japan, a turnover rate in visiting nurse was higher than hospital nurse. Additionally, in a ratio of shortage of nurse to demand of one, the estimated ratio on visiting nurse were also higher than hospital one was reported.⁶

On the other hand, there appeared to be no studies related on a relationship between organizational commitment and intent to stay on visiting nurse. Thereupon, this study aimed to explicit the relationship on visiting nurse.

This study focused on female nurse with their children. The reason was that it was said that some of them choosed visiting nurse due to not being able to work a night shift job leaving their children at home.⁷

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8 - 2014). The questionnaire and the written request were mailed to subjects. Return of the completed questionnaire was taken as consent to participate with this study.

Analysis Method: Score of opposite items in questionnaire were inverted prior to the analysis. Then, using a reliability analysis for improvement a precision of analysis, some items were reduced. After the reduction, the sum of scores of items was to the score of organizational commitment questionnaire (OC).

STATISTICAL ANALYSIS

Only variables which were statistically significant with the presence of intent to stay using univariate statistics (Wilcoxon signed-rank test) were analyzed with multivariate analysis (multiple logistic regression). The level of significance was set at $p < 0.05$. Data were analysed using SAS university edition and SPSS ver20.

RESULTS

Survey forms were mailed to 311 visiting nurse station at two prefecture in Tokai area. Although the number of nursing personnel working in individual station were unknown, six sets of survey form were mailed because an average number of visiting nurse per one visiting nurse station were 4 or 5 in Japan.

As a result, 264 nursing personnel in 91 stations responded. Among them, 194 met inclusion criteria but two of 194 missed responses on the presence of intent to stay and OC. Consequently, valid respondents 192 were analyzed in this study.

In the result of univariate statistics (Table 1), median of age was 46 and cumulative years of nursing service was 13, years of service for their current workplace was 3, OC was 19.

Respondent number of the presence of intent to stay was 144, one of the intent to leave or undecided was 49.

In terms of OC, reliability analysis were implemented at first. As a result, items showing a corrected item-total correlation (CITC) were negative or less than 0.400 were eliminated. Then, scores of the remaining 12 items were summed to OC (Table 2). The cronbach's coefficient α rised 0.886 with 12 items from 0.852 with 24 items, therefore.

In the result of the univariate analysis, age and OC of visiting

nurses were revealed variables significantly related with the presence of intent to stay (Table 3).

Subsequently, these 2 variables as explanatory ones were analyzed with the logistic regression analysis (Table 4).

In the result of the multivariate analysis, both of these variables were clarified significant ones. The odds ratio of age and OC were 0.9030($p=0.0030$), 1.0690($p=0.0004$) respectively.

Variables	N	Median	Min	Max
age	192	46	26	74
cumulative years of service	183	13	0	50
years of service for current workplace	187	3	0	26
OC [†]	192	19	0	35
*0 implies under year of service. †OC is an abbreviation for Organizational Commitment Scale. The OC questionnaire consisted of 12 items in this study (score range: 0 – 36).				
Table-1: Descriptive statistics (N=192)				

Affective Commitment Scale Items
I would be very happy to spend the rest of my career with this organization.*
I enjoy discussing about my organization with people outside it.*
I really feel as if this organization's problems are my own.*
I think that I could easily become as attached to another organization as I am one to this.
I do not feel like "part of the family" at my organization.*
I do not feel "emotionally" attached to this organization.*
This organization has a great deal of personal meaning for me.
I do not feel a strong sense of belonging to my organization.*
Continuance Commitment Scale Items
I am not afraid of what might happen if I quit my job without having another one lined up.*
It would be very hard for me to leave my organization right now, even if I wanted to.
Too much of my life would be disrupted if I decided I wanted to leave my organization right now.*
It wouldn't be too costly for me to leave my organization now.*
Right now, staying with my organization is a matter of necessity as much as desire.
I feel that I have very few options to consider leaving this organization would be the scarcity of available alternatives.
One of the few negative consequences of leaving this organization would be the scarcity of available alternatives.
One of the major reasons I continue to work for this organization is that leaving would require considerable personal sacrifice: another organization may not match the overall benefits I have here.
Normative Commitment Scale Items
I think that people these days move from company to company too often.
I do not believe that a person must always be loyal to his or her organization.*
Jumping from organization to organization does not seem at all unethical to me.
One of the major reasons I continue to work in this organization is that I believe loyalty is important and therefore feel a sense of moral obligation to remain.*
If I got another offer for a better job elsewhere I would not feel it was right to leave my organization.*
I was taught to believe in the value of remaining loyal to one organization.
Things were better in the days when people stayed in one organization for most of their careers.
I do not think that to be a "company man" or "company woman" is sensible.
*Only these items were analysed in this study.
Table-2: Organizational Commitment Scale Items by Meyer & Allen

Variables	group		p-value
	Intent to stay	Intent to leave or undecided	
age	45(N=144)	47(N=47)	0.012 [†]
cumulative years of service	13(N=140)	13(N=43)	0.528
years of service for current workplace	3(N=141)	4.5(N=46)	0.132
OC	19(N=144)	15(N=48)	0.003 [†]
*Wilcoxon signed-rank test was used.			
†p<0.05			
Table-3: The result of univariate statistics* (N=192)			

Variables	Odds ratio	Confidence interval	p-value
age	0.930	0.856-0.953	<0.001*
OC	1.069	1.023-1.116	0.003*
*p<0.05			
Table-4: The result of multivariate analysis (N=192)			

Concretely, as growing one year old additionally, a probability of having the intent to stay showed to decrease 0.93 times. Similarly, as getting one point of OC additionally, a probability of having it indicated to increase 1.069 times. AIC was 189.198. The Hosmer-Lemeshow test showed 5.816, so that this model was not appreciated non-goodness of fit.

DISCUSSION

The purpose of this study was to clarify the relationship the intent to stay of female visiting nurse with children and their OC. As a result, it revealed both of them had a statistically significant relationship.

The increasing of OC suggested that the probability of continuation of visiting nurse in current workplace.^{1,3} In this study, these 12 item in organizational commitment questionnaire consisted of 6 Affective Commitment items and 3 Continuance Commitment items, 3 Normative Commitment items (Table2). Hence, for the purpose of rise OC with visiting nurse, it thought that focusing on the side of affective commitment was effective. Specifically, the importance for retain visiting nurse in current workplace was guidances and supports by the administrator so that the affective commitment of them rised.^{1,3} However, such an activity of administrator belonged to visiting nurse station is not explicit so far. In the future, it is necessary to investigate such activities of the administrator.⁹⁻¹⁰

LIMITATION

Although this study focused visiting nurse, if the appropriate behaviour of administrator affectes a continuation of working of visiting nurses in current workplace (visiting nurse station), in the future, investigation on not only visiting nurse but also administrator in so stations must be conducted si-

multaneously. Accordingly, the limitation with this study was thought that the subject in it was only visiting nurse.

CONCLUSION

The intent of stay of visiting nurses in cuurent their workplace at 2 prefectures in Tokai area in Japan was significantly related with age and OC of them.

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Clinical Evaluation of Self-Secured Spring Separator

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ABSTRACT

Introductin: To examine two types of orthodontic separators, focusing on the separating effect, loss of separators and patients' perception of pain and discomfort.

Materials and Methods: The separators tested were Kansal separators and elastomeric separators. Thirty patients participated, and all were scheduled for treatment with a fixed orthodontic appliance. Two Kansal and 4 elastomeric separator were placed alternately in the left or the right quadrant. After a separation period of 5 days, the amount of separation was measured with a leaf gauge. Discomfort evaluated with questionnaires.

Results: The mean separation was 0.33 mm for the spring-type and 0.47 mm for the elastomeric separators ($P < .05$). The Kansal were considered less painful than the elastomerics, but the difference was not statistically significant. Loss of separator was less with Kansal separators.

Conclusions: The separation effect of the two separators was considered clinically equivalent and since pain of moderate intensity occurs during the separation period.

Keywords: Leaf gauge, Nickel titanium, Orthodontic separators, Kansal Separators

INTRODUCTION

Orthodontic separators are devices, which used to create a space between adjacent teeth, to facilitate the accurate placement of the orthodontic bands. Separators are inserted so it can force or wedge the teeth apart and kept there for a period of time for a initial tooth movement to be occurred. That a gap or space is created between them to enable the banding procedure^{1,2}

Elastomeric separators have proven their wide range of efficiencies, such as banding the molars for fixed orthodontic treatment.^{1,2} in the induction of the eruption of partially impacted mandibular second molars.^{3,4} before the interproximal reduction of adjacent teeth and cases were malposed molars required space for crown restoration.^{5,6}

For successful banding in Orthodontics, adequate separation of teeth is required. For separation of teeth various commonly practiced methods such as metal separators, elastomeric separators, brass wire and newly introduced Self-Secured Spring Separator, etc. The inherent disadvantage of all these commonly used modalities is the frequent dislodgement of these separating devices. A dislodged separator may be troublesome if ingested metal separators especially, or it may get

wedged between the adjacent teeth causing acute localized periodontitis.⁷ On the day of banding appointment, failure of the tooth separation is a constant source of frustration for the orthodontist. To overcome these clinical problems of conventional separators, the Kansal Self-Secured Spring Separator was conceptualized.^{1,2}

The mechanism behind the separator loss is a progressive reduction of contact point tightness which permits separator loss before banding appointment. Which eventually disrupts the treatment progress, as well as increased discomfort experienced by the patient from second-time separator placement, Hence protocol of separation, should be evaluated for newly introduced Self-Secured Spring Separator along with elastomeric separators.

The study was designed for assessing the pain, discomfort and amount of separation of two types of separators (i.e. Elastomeric and Self-Secured Spring Separator) and also the percentage of loss of these separators.

MATERIAL AND METHODS

A sample of thirty patients, including 15 males and 15 females with a mean age of 15.23 years (standard deviation, 2.43 years), from the Department of Orthodontics and Dentofacial Orthopaedics at Saraswati Dhanwantari Dental College and Hospital, Parbhani, were participated. To be included in the study, the patients seeking treatment with a fixed orthodontic appliance in the both maxillary and mandibular arch, also had to have bilaterally approximal contacts, mesially and distally, at the first permanent molars. All patient with the previous history of orthodontic treatment, Dental caries and restoration on the proximal surface permanent molars, and evidence of a periodontal or gingival problem excluded.

All patients were informed that their participation in the

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study was confidential with a voluntary basis. Signed informed consent from all the patients were obtained before initiating the study. The separators used were Kansal steel separators (Custom made)⁸ and elastomeric separators made of polyurethane and with radiographic opacity (D-Tech, USA) (Figure 1). The Kansal Separators were applied with light-wire pliers and the elastomeric Separators with Separator placing plier. For each patient, The 2 Kansal Separators and four elastomeric separators were applied alternately on the right or the left side of the maxilla and mandible to avoid side bias (Figure 2).

Measuring the separating effect

All the patients were recalled when the separators had been in place for five days, the number and types of separators lost were recorded. With the day, separators were lost also recorded. The elastomerics and springs were removed with a curved probe and bird beak pillar, respectively. All first molars were air dried with air-spray. Then the leaf gauge is used to measure the amount of separation on a mesial and distal aspect of each first molars (Figure 3).

Investigation of patient perception of pain or discomfort

Perception regarding of pain/discomfort was recorded using the series of 5 questionnaires. The patients were instructed orally and written in the local language, with an explanation of how to attend questionnaires. For baseline perception of pain and discomfort, an initial survey was carried out before separator placement. Then, a questionnaire was completed once a day at home for the following three days.

3 Questionnaires were to be completed at home at the same time every day, and the patient was instructed to put fully completed the questionnaire in the enclosed envelopes provided by the Department of Orthodontic and Dentofacial Orthopaedics and seal it so that he or she would not be influenced by the answers on the day before. Finally, one remaining questionnaires were completed at the clinic on day 5, at the time of removal of the separators.

The questionnaires consisted of nine questions describing pain and discomfort. Four questions used a visual analog scale (VAS), each being 10 cm in length with graphically represent the two ends of descriptive terminology, as “no pain” versus “pain as bad as it could be barred.”⁹ Patient instructed to select a graphically represented point that indicated patients perception of pain severity and the linear distance was measured from the end of the scale to a graphical point. This distance indirectly represents the severity of pain. Calculation of VAS scored achieved by measuring the distance from the vertical mark placed by the patient as a response to each question to the point left-hand end of VAS scale.

1. “Do your upper molars hurt when you chew on the right side?”
2. “Do your upper molars hurt when you chew on the left side?”



Figure-1: Separators Used study.



Figure-2: Intra Oral view of separators



Figure-3: Leaf gauge

3. “Do your upper molars hurt at rest on the right side?”

4. “Do your upper molars hurt at rest on the left side?”

Each questionnaire had five question that to be answered by choosing “yes” or “no”:

1. “Has it hurt so much that you have changed your food habits to soft food like yogurt, banana, etc.?”
2. “Has it hurt so much that your leisure activities were influenced, e.g., music, sports, time with friends?”
3. “Has it hurt so much that your schoolwork was influenced?”
4. “Has it hurt so much that you have been awake in the

night?”

5. “Has it hurt so much that you have had to take pain-killers?”

STATISTICAL ANALYSIS

For each study groups, descriptive statistical analysis with means and standard deviations were calculated. Along with the percentage of separator loss against time were evaluated. ANOVA test with repeated measurement was performed. With these, a comparison of the pain discomfort due to the separator over duration calculated. Other factors (1) the amount of separation at separator removal, (2) the time at which the separator loosed and (3) No of separator present at 5th day. Post-hoc Bonferroni adjustments showed significant differences between all groups ($P < .05$).

Wilcoxon’s matched-pairs signed-rank test was used for qualitative variables, eg, whether there was any significant difference in the amount of pain reported due to the separators.

RESULTS

Comparison of the separation effect of individual separators after five days evaluated. The separation effect of both separators were compared individually at 5th day and observed that the difference of separation produced by both types of separators was the statistically less significant. Among separators, elastomeric separators produced the consistently greater amount of separation on 5th days. [Table 1].

Seven elastomeric separators were lost and 2 Self-Secured Spring Separator, at day 2. (Table 1). In one case, due to mastication, a Self-Secured Spring Separator, was distorted subsequently removed by the patient himself. In other case, a particular reason for dislodgement was not found. The mean amount of separation for Self-Secured Spring Separator was 0.33 mm and while the elastomeric Separator shows 0.47 mm and the difference in effect was less significant.

Pain and discomfort

All 30 subjects attended the whole study, and all subjects completed all questions on all questionnaires Hence, the response rate was excellent. None of the patients had pain before separator placement.

Pain with moderate intensity was observed with 13 Self-Secured Spring Separator and 21 elastomeric separators at the mandibular first molar during eating and mild pain at rest during the 1st day. 11 Self-Secured Spring Separator and 17 elastomeric separators reported pain in maxillary first molar during first three days. The patients noted the elastomerics as a little more painful as compared to the Self-Secured Spring Separator, but the difference was not statistically significant after insertion, the pain gradually increased with both separators, and peaked on the day 3.

The pain started to subside on the fourth day and, by day 5,

	Days	Self-Secured Spring Separator (n=60)		Elastomeric Separator (n=120)	
		Count	Percentage	Count	Percentage
Separator loss and percentage	Day 1	60	0%	120	0%
	Day 2	58	4%	113	6%
	Day 3	58	4%	104	14%
	Day 4	56	7%	99	18%
	Day 5	56	7%	92	24%
Separation Effects		Mean	SD	Mean	SD
	5 th Day	0.33	0.25	0.47	0.29

Table-1: Percentage of separator loss and separators effect

the pain was almost absent for elastomeric separators. During 4th and 5th-day, a side with elastomeric separators, were less painful but side with Self-Secured Spring Separator had pain higher than elastomeric separators.

Thirteen of the 30 patients, none of the patients had severe pain that they needed analgesics. 17 patients had changed their food habits shift to the side with Self-Secured Spring Separator were placed during initial three days. Two patients had been awake at night because of the pain, and one stated that the separation influenced his leisure activities. None of the 30 patients had had such severe pain or discomfort that their school work was influenced.

DISCUSSION

The orthodontic band and band materials available in a variety of size and shape such as preformed band or in material band spool. With specific dimension for different tooth such as on anteriors: 0.004 X 0.125 inch or 0.003 X 0.125 inch, on bicuspid: 0.005X0.15 inch; or 0.004X0.15 inch; and on molars: 0.006 X 0.18 inch; or 0.006 X 0.20 inch. Insufficient separation cause, the band setting pressure that result in pain and discomfort to the patient during and after banding procedures apart from causing improper seating of bands.⁸

The difference in separation effect between Self-Secured Spring Separator and elastomerics was small, statistically less significant, and the two separators were considered clinically relevant. The space necessary for banding is approximately 0.25 mm; i.e., the amount of separation, 0.33 and 0.47 mm for Self-Secured Spring Separator and elastomerics, respectively, was near twice the thickness of a molar band. The amount of separation produced by Self-Secured Spring Separator was less as compared to an elastomeric separator that might be the due to the difference in force generated by two separators. Elastomeric separator provides rapid separation while Self-Secured Spring Separator having slow separation. Orthodontic literature supports varying the degree of individual pain and discomfort to orthodontic forces^{11,12} and this tends to be observed in this study. Another factor that affects varying the degree of response is elastomeric separator having rapid separation effect that provoke pain with higher intensity during initial three days, the pain starts subsiding as separation occurred, or elastomeric separators were loosed. On another aspect, Self-Secured Spring Separator remained at their placed and generated light and continuous separating force with continue till the end of the study. Pain aggression

during the 4th and 5th day may be due to the relative reduction of associated with elastomeric separators.

It was observed that daily activities of the patients not affected severely expect, eating food choices were fairly considerable since 17 of 30 patients had changed to soft food. The influence on leisure activities (sports or social life), as well as interference with schoolwork, was considered small or negligible.

For evaluation of pain and discomfort intensity, Visual analog scale is most commonly implemented tool. Its simplicity makes application and scoring easier. Hence in this study the VAS used to assess pain and discomfort. Validity and reliability of VAS for measurement of discrete pain and small discrimination in intensity changes has been established.¹³ Furthermore, In the assessment of pain and discomfort VAS rarely fails after the age of 5.¹⁴ Previously recorded studies shown that VAS was effective to differentiate between the pain and discomfort in the anterior segment and posterior segment teeth after placement of initial archwire.¹⁵ Hence, in this study the patients had no problems in discriminating between pain/discomfort in right and left posterior teeth.

CONCLUSION

Both separators showed a significant amount of separation between the molars and premolar on 5th days. Elastomeric separators proved to produce the faster separation effect among separators, with a mean separation of 0.47 ± 0.29 mm after five days of separator placement. The highest percentage of loss of these separators was recorded with Elastomeric separators that were 24%, and least was seen with Self-Secured Spring Separator with 3% of these separating Springs for five days. Pain with Mild to moderate intensity was observed with both types of separators, with the Self-Secured Spring Separator considered less painful about the elastomerics, but the difference found was less statistically significant. The pain was increased after three days and had subsided almost entirely by the fifth day. While pain continues with Self-Secured Spring Separator. Kansal Self-Secured Spring Separator is a good alternative for conventional separators with proven Self-Secured action by comparatively less loss of separators during this study.

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Analysis of Serum Lipoproteins, Apolipoproteins in Acute Viral Hepatitis Caused by HBV, HCV

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ABSTRACT

Introduction: Liver is the most important organ which is responsible for formation and clearance of Lipoproteins, Lipids, Apolipoproteins. Acute Viral hepatitis constitute most common among all hepatitis. Estimation of Changes in lipids, lipoproteins, apolipoproteins aid in diagnosis.

Materials and Methods: All the patients were divided into two groups for a comparative study between Viral hepatitis patients and others without any sepsis. They are study group and control group. All patients blood sample has processed for routine examination of Liver function tests, Renal function test, Blood glucose, Detection of viruses, complete blood count, Peripheral smear, Blood coagulation status. HBV and HCV positive samples serum lipid profiles were compared with control subjects and tabulated.

Results: Total Cholesterol (TC), High Density Lipoprotein - Cholesterol (HDL-C), Apolipoprotein A1, Apolipoprotein B levels shown lower levels in study group when compared to control group and in contrast Low Density Cholesterol - Cholesterol (LDL-C) and Triglycerides(TG's) shown higher levels in study group. Total Cholesterol, Triglycerides, HDL-C, LDL-C, Apolipoprotein A1, Apolipoprotein B levels were lower in acute phase than in recovering phase of viral hepatitis.

Conclusion: Assessing this variations in lipidemic levels will help in diagnosing the acute viral hepatitis condition and helps in starting therapy towards prevention of cardiovascular diseases.

Keywords: Lipoproteins, Apolipoproteins, Viral Hepatitis.

INTRODUCTION

Liver is the most important organ which is responsible for formation and clearance of Lipoproteins, Lipids, Apolipoproteins. It receives cholesterol from diet and peripheral tissues by metabolizing of those products, lipoprotein complexes are formed and released into blood circulation.^{1,2}

Lipoprotein are molecular complexes that consist of lipids and proteins (conjugated proteins). They function as transport vehicles for lipids in blood plasma. Lipoproteins deliver the lipid components (cholesterol, Triacylglycerol etc.) to various tissues for utilization. The protein components of lipoproteins are known as Apolipoproteins which recognize the cell membrane surface receptors and also activate enzymes involved in lipoprotein metabolism.³

It was observed that on damage of Liver functions, metabolism of lipids changes in vivo in turn leads to disturbance of the concentrations of lipids and lipoproteins in the blood. Albumin is solely synthesized by liver. Serum albumin is a good marker to assess chronic liver damage. Low serum albumin is commonly observed in patients with severe liver damage.³ Based on these documentations, changes in lipids, lipoproteins, apolipoproteins can be considered as a diagnostic factors for liver damage conditions.

Hepatitis which is a general term referred to as inflammation of the liver. Hepatitis may occur due to various infectious or noninfectious causes. In this study Acute viral hepatitis is considered which accounts for more than 50% of cases of acute hepatitis in the United states.

Acute viral hepatitis causing etiological factors most commonly are all Hepatotrophic viruses (Hepatitis A virus, Hepatitis B virus, Hepatitis C virus, Hepatitis D virus, Hepatitis E virus). Among them Hepatitis B and Hepatitis C viruses are causing major public health problem. Nearly two billion people in the world have been acutely infected by HBV and there are nearly 350 million people chronically infected with HBV.⁴⁻⁶ Among HCV there are an estimated 170-200 million people all over the world.⁷ Hepatitis B and Hepatitis C viruses can lead to chronic infection. Chronic hepatitis carriers remain infectious and may transmit the disease for many years.⁸

Vaccines to prevent hepatitis B have been available since 1986 and have been incorporated into atleast 177 national immunization programs for children. Hepatitis B immunization is successfully leading in the world. Now-a-days Hepatitis C cases are arising.

Acute Viral hepatitis constitute most common among all hepatitis. Estimation of Changes in lipids, lipoproteins, apolipoproteins aid in diagnosis and also helps in treating the dyslipidemic states and inturn reducing the morbidity due to

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conditions like coronary heart disease. The present study has done to detect the alterations in serum lipids in acute viral hepatitis patients.

MATERIALS AND METHODS

We did this randomized study at Siddhartha Medical College among patients attending medicine, surgery departments considering both sexes. Informed consent has taken from all patients. All the patients were divided into two groups for a comparative study between Viral hepatitis patients and others without any sepsis. They are study group and control group.

Study group (60 patients) were those patients who shown positivity to HBV or HCV. Control group (60 patients) were those patients who admitted to hospitals with complaints other than sepsis like trauma, Diabetes, stroke. Detailed Medical history has taken and complete examination has done.

Patient's blood sample has drawn into test tubes in the early morning as fasting sample and stored at 4°C until proceeds for serum lipid profile estimation and detection of viruses. All patients blood sample has processed for routine examination of Liver function tests, Renal function test, Blood glucose, Detection of viruses, complete blood count, Peripheral smear, Blood coagulation status.

Detection of Viruses

HBV and HCV viruses estimation has done using lateral flow Immunochromatographic method by Anti HBsAg and Anti HCV antibodies in the serum.

Serum Lipid Profile estimation has done by following methods:

1. Estimation of serum total cholesterol (TC) by cholesterol oxidase / phenol aminoantipyrine method.
 2. Estimation of serum triglycerides (TG) by glycerol phosphate oxidase – phenol aminoantipyrine method.
 3. Estimation of serum High density lipoprotein (HDL) by cholesterol oxidase / phenol aminoantipyrine method.
 4. Estimation of serum Low density lipoprotein (LDL) by Friedewald formula
 5. Estimation of Apolipoprotein A1 and Apolipoprotein B were estimated by immunological turbidimetry method.
- HBV and HCV positive samples serum lipid profiles were compared with control subjects and tabulated.

STATISTICAL ANALYSIS

Statistical Significance was calculated by t value, df and P value using Graphpad software.

RESULTS

Study group (60 patients) were those patients who shown positivity to HBV or HCV. Control group (60 patients) were

those patients who admitted with problems other than hepatitis symptoms.

Control group were selected such that sex and age should correlate with study group (Table No:1). In this study the mean age group of both study and control group was about 34.5(±2.8).

Seroprevalence of AntiHBsAg was 88.3%(53 patients) and Anti HCV positivity was 11.6% (7patients). Serum Lipid profile status among HBV and HCV patients are almost similar.

Serum lipid profile has compared between Study group and Control Group and depicted in Table No:2

Total Cholesterol (TC), High Density Lipoprotein - Cholesterol (HDL-C), Apolipoprotein A1, Apolipoprotein B levels shown higher levels in study group when compared to control group and in contrast Low Density Cholesterol - Cholesterol (LDL-C) and Triglycerides (TG's) shown lower levels in study group.

All the lipoproteins and apolipoproteins in acute viral hepatitis Statistically significance was estimated (Table No:3).

Total Cholesterol, Triglycerides, HDL-C, LDL-C, Apolipoprotein A1, Apolipoprotein B levels were lower in acute phase than in recovering phase of viral hepatitis.

DISCUSSION

Liver is the most important organ for metabolism of lipoproteins and apolipoproteins. Hepatitis refers to inflammation of liver, condition which alters the metabolism of lipids *in vivo*. Acute viral hepatitis has become most important and causing public health issue. Diagnosing viral hepatitis now-a-days is not such a problematic condition because of availability of many rapid diagnostic kits based on Immunochromatographic principle and also ELISA tests are available with more sensitivity and specificity.

S.No.	Characteristics	Study group	Control group
1	Number of cases	60	60
2	Age	34.5(±2.8)	34.8(±1.5)
3	Males	41	41
4	Females	19	19
<i>P</i> value has calculated using Graphpad software, it is statistically not significant			
Table-1: Showing Mean Age and Sex distribution.			

S.No.	Serum Lipids	Study group (n=60) Mean ± S.D	Control group (n=60) Mean ± S.D
1	Total Cholesterol	165.7±2.3	205.7±3.4
2	Triglycerides	160.4±2.3	154.6±5.6
3	HDL-C	44.7±8.5	45.2±7.6
4	LDL-C	101.4±2.3	93.7±3.8
5	Apolipoprotein A1	108.2±6.5	119.5±2.9
6	Apolipoprotein B	110.2±7.2	118.6±5.6
Table-2: Comparing of Serum Lipid profile among study and control group			

S.No.	Serum Lipids	t value	df	P value	Significance
1	Total Cholesterol	75.4807	118	< 0.0001	ESS
2	Triglycerides	7.4211	118	< 0.0001	ESS
3	HDL-C	0.3397	118	0.7347	NSS
4	LDL-C	13.4277	118	< 0.0001	ESS
5	Apolipoprotein A1	12.2976	118	< 0.0001	ESS
6	Apolipoprotein B	7.1333	118	< 0.0001	ESS

ESS-Extremely Statistically significant; NSS-Not Statistically significant.

Table-3: Showing Statistical significance of serum lipid profile estimation

Estimation of changes in levels of lipoprotein and apolipoproteins are also aid in the diagnosis of acute viral hepatitis cases as well as useful in prognostic assessment.

In the present study age, sex of control group selected such that those match well with study group. In the study group those patients who were either HBV or HCV positive were selected for estimation of lipids. Among all patients serum liver enzymes such as AST, ALT and GGT were raised. Blood coagulation status of patients were within limits.

As per this study, Total Cholesterol (TC), High Density Lipoprotein - Cholesterol (HDL-C), Apolipoprotein A1, Apolipoprotein B levels shown lower levels in study group when compared to control group and in contrast Low Density Cholesterol - Cholesterol (LDL-C) and Triglycerides(TG's) shown higher levels in study group. All the lipoproteins and apolipoproteins except LDL-C levels in acute viral hepatitis were extremely statistically significant when compared to normal subjects.

Concepcion Alvarez et al⁹ reported that decrease in Total Cholesterol, HDL-C during sepsis especially in viral infections and there is increase in Triglycerides, decrease in Apolipoprotein A1, Apolipoprotein B during sepsis. Libo luo et al¹⁰ reported that total cholesterol, HDL-C and apoA1 were decreased significantly in acute hepatitis cases when compared to normal subjects and increase in Triglycerides and LDL-C among patients than in normal subjects.

In contrast to the present study, Maggi et al,¹¹ Fabris et al,¹² Serfaty et al¹³ reported that there is increase in total cholesterol and whereas, decrease in LDL levels in HCV infected patients compared to control groups. Marzouk et al¹⁴ reported lower prevalence of Triglycerides among HCV patients. Supporting to these studies Ehab H Nashaat¹⁵ documented that decrease in Total Cholesterol, LDL, Triglycerides among HCV patients.

We observed that Total Cholesterol, Triglycerides, HDL-C, LDL-C, Apolipoprotein A1, Apolipoprotein B levels were lower in acute phase than in recovering phase of viral hepatitis.

Concepcion Alvarez et al⁹ documented the return of serum lipids to more normal concentration parallels the recovery from sepsis. Libo luo et al¹⁰ documented as plasma levels of Total Cholesterol, HDL-C, LDL-C and apoA1 were lower at the active phase of the diseases than at the recovering phase and reported that lipid metabolism in vivo was influenced by acute liver damage significantly.

CONCLUSION

Acute Viral Hepatitis patients has lower levels of Total cholesterol, HDL-C, apoA1 and apoB than noninfected patients. Triglycerides, LDL-C were higher in acute viral hepatitis patients when compared to noninfected patients. Assessing this variations in lipidemic levels will help in diagnosing the acute viral hepatitis condition and helps in starting therapy towards prevention of cardiovascular diseases.

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A Role of N-Cadherin in Tumor Progression and Prognosis of Epithelial Malignancy

Harish chandra Rai K¹, Junaid Ahmed²

ABSTRACT

Epithelial cells typically express E-cadherin, mesenchymal cells express various cadherins, including N-cadherin, R-cadherin and cadherin-11. N-cadherin is also known as neural-cadherin, non-epithelial cadherin or cadherin-2 and CD325. The term cadherin switching usually refers to a switch from expression of E-cadherin to expression of N-cadherin. Several studies from current literature have shown de novo expression, re-expression, up-regulation and down-regulation of N-Cadherin in human tumors and tumoral cell lines like breast cancer, gastric cancer, pancreatic cancer, esophageal cancer, oral cancer, prostate cancer, lung cancer, and urinary system cancer. We focus here on the pattern of N-cadherin expression in these malignant tumors of the epithelial origin to evaluate its critical contribution in tumor progression and prognosis.

Keywords: Cancer, Epithelial tumor, N-cadherin, Tumor progression, Cadherin switching.

INTRODUCTION

Cadherins are single pass transmembrane proteins that are synthesized with a single peptide (SP) and pro region (pro), which are removed during protein processing. The extracellular domain comprises five homologous repeats (EC1-EC5) that are bridged by calcium ions (Ca²⁺). The cytoplasmic domain binds to p120-catenin (p120ctn) near the plasma membrane and to β-catenin near the C-terminus. β-catenin binds to α-catenin to link the cadherin complex to the actin cytoskeleton.¹

More than 80 different members constitute the group of cadherins, such as the well investigated epithelial, neural and placental cadherins. Epithelial cells typically express E-cadherin, whereas mesenchymal cells express various cadherins, including N-cadherin, R-cadherin and cadherin-11. Endothelial cells express VE-cadherin, which is specific to these cells and is found in the junctional complex, and N-cadherin, which is not found in junctions and has an unclear function. Cadherins are important in the establishment of cell polarity and cell sorting during embryonic development.^{1,2}

N-cadherin was first identified in 1982 (Grunwald et al., 1982) as a 130 kD molecule in the chick neural retina that was protected by calcium from proteolysis, and in 1984 A-CAM was identified (now called N-cadherin) as a molecule that was localized at the adherens junctions (Volk and Geiger,

1984). In the nomenclature of CD antigens the new designation for N-cadherin is CD325, N-cadherin is also known as neural-cadherin, non-epithelial cadherin or cadherin-2. The N-cadherin gene in mice was located on chromosome 18 (Miyatani et al. 1989) and via Yeast Artificial Chromosome (YAC) analysis the structure of the human N-cadherin gene was determined, the entire N-cadherin gene was mapped to a 250-kb region on chromosome 18q11.2. The gene is composed of 16 exons, and homology was found not only between human and mouse, but also between N-cadherin and other cadherins (Wallis et al., 1994). N-cadherin typically forms homotypic homophilic interactions; also heterotypic homophilic and heterophilic interactions have been described.³

The term cadherin switching usually refers to a switch from expression of E-cadherin to expression of N-cadherin, but also includes situations in which E-cadherin expression levels do not change significantly but the cells turn on (or increase) expression of N-cadherin. It also includes examples in which other cadherins replace or are co-expressed with E-cadherin, including R-cadherin, cadherin 11, T-cadherin and even P-cadherin, and the expression of the 'inappropriate cadherin' might alter the behavior of the tumor cells.¹ Several studies from current literature have shown de novo expression, re-expression, up-regulation and down-regulation of N-Cadherin in human tumors and tumoral cell lines. We focus here on the pattern of N-cadherin expression in different malignant tumors of the epithelial origin to evaluate its critical contribution in tumor progression and prognosis.

Breast cancer

In breast cancer, N-cadherin promotes motility, invasion, and metastasis even in the presence of the normally suppressive E-cadherin. The increase in MMP-9 production by N-cad-

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herin expressing cells in response to a growth factor (FGF-2) may endow them with a greater ability to penetrate matrix protein barriers, while the increase in their adherence to endothelium may improve their ability to enter and exit the vasculature, two properties that may be responsible for metastasis of N-cadherin expressing cells (Rachel B. Hazan and others, 2000).⁴ Marvin T. Nieman et al (1999) also suggested that N-cadherin promotes motility and invasion and that decreased expression of E-cadherin does not necessarily correlate with motility or invasion in breast cancer cells.⁵ Overexpression of N-cadherin and Snail were also significantly correlated with poorly differentiated carcinoma, positive node status, and poor Nottingham Prognostic Index. They suggested that increased N-cadherin and decreased E-cadherin expression may be used as indicators of the progression and prognosis of invasive ductal carcinoma (H M Abd ElMoneim et al (2011)).⁶ The presence of N-cadherin prevents the re-expression of E-cadherin and localization of β -catenin at the plasma membrane of mesenchymal mammary carcinoma cells. N-cadherin is also required to maintain the expression of VE-cadherin in malignant tumor cells but not vice versa. Thus, N-cadherin acts in concert with VE-cadherin to promote tumor growth.⁷ (Maryam Rezaei et al 2012)

Gastric cancer

The abnormal expression of N-cadherin were involved in the process of invasion and metastasis of GC. The data showed that E-cadherin might switch to N-cadherin. TGF- β 1 and Snail might play a fundamental role in the process (Yingfeng Zhu et al 2007).⁸ Expression of N-cadherin was observed in varying degrees in the intercellular spaces between tumor cells in 11 tubular adenocarcinomas and in six poorly differentiated adenocarcinomas, including E-cadherin-negative cases (Kunio Yanagimoto et al 2001).⁹ Takahito Kamikihara et al (2012), also studied the neoexpression of N-cadherin in gastric cancer may be a useful prognostic marker independent of E-cadherin expression.¹⁰

Pancreatic cancer

N-cadherin expression correlated with neural invasion, histological type, fibroblast growth factor expression in primary tumors and TGF expression and vimentin in metastatic tumors. overexpression of N-cadherin is involved in Epithelial-Mesenchymal Transition (EMT) and is affected by growth factors. Because EMT is an important process in the invasion and metastasis of malignant tumor cells, it is possible that N-cadherin is the adhesion molecule not only to acquire the fibroblastic morphology of EMT but also to obtain invasive and metastatic potential.¹¹ (S Nakajima et al 2004) The N-cadherin antagonist ADH-1 has significant antitumor activity against N-cadherin-expressing pancreatic cancer cells, both in vitro and in an orthotopic mouse model for pancreatic cancer (Y Shintani et al, 2008). This study highly implicates N-cadherin as a valid target for treatment of human pancreatic cancer, and suggests that N-cadherin antag-

onists like ADH-1 that target its adhesive function should be developed for use in treatment of human pancreatic cancer.¹² Esophageal cancer

N-cadherin expression was negatively correlated to E-cadherin expression in Esophageal squamous cell carcinoma (ESCC). Negativity of E-cadherin and positivity of N-cadherin were correlated to invasion, differentiation, and lymph node metastasis of ESCC. (Ke Li et al 2009)¹³ The knock-down of N-cadherin in ESCC cell line (EC9706) could arrest cell cycle at G0/G1 phase, induce cell apoptosis, reduce the invasiveness in vitro, and inhibit the tumor formation in vivo. These results suggest that N-cadherin is an important factor in the progression and metastasis of ESCC and N-cadherin may serve as a potential molecular target for biotherapy of ESCC.¹⁴ (Li K et al 2010).

Oral cancer

The squamous cell carcinoma derived cell line which is expressed N-cadherin and displayed a scattered fibroblastic phenotype along with decreased expression of E- and P-cadherin. Transfection of this cell line with antisense N-cadherin resulted in reversion to a normal appearing squamous epithelial cell with increased E- and P-cadherin expression. In addition, transfection of a normal-appearing squamous epithelial cell line with N-cadherin resulted in downregulation of both E- and P-cadherin and a scattered fibroblastic phenotype.¹⁵ (S Islam et al 1996). Reduced E-cadherin and positive N-cadherin expression are closely associated in oral squamous cell carcinoma, cadherin switching probably plays an important role in the development of oral squamous cell carcinoma and metastasis.¹⁶ (S W PYO et al 2007)

In oral squamous cell carcinoma, the nuclear pattern of N-Cadherin expression was particularly observed in dedifferentiated cancer, characterized by a worse prognosis (M. Di Domenico et al, 2011). Therefore the pattern of cadherin expression might constitute a useful diagnostic and prognostic tool in the evaluation of tumors and for determining the histogenesis of tumour cells. Moreover, they found a statistically significant correlation between N-Cadherin expression and grade, and a statistical trend for stage.¹⁷

Nguyen P T et al (2011) suggested that i) N-cadherin may play an important role in malignant behaviors of Head and neck squamous cell carcinoma (HNSCC) and ii) cadherin switching might be considered as a discrete critical event in EMT and metastatic potential of HNSCC.¹⁸ The increased invasiveness seen in N-cadherin expressing cells of the oral squamous cell carcinoma are the result of N-cadherin-driven signaling pathways and not due to the associated loss of E-cadherin (K R. Lawson et al 2006).¹⁹ The upregulation of Snail and N-cadherin and downregulation of E-cadherin correlated significantly with both integrin-linked kinase (ILK) over expression and tumor metastasis (Dan zhao et al 2012). They suggested that ILK may have an important role in progression and metastasis of oral squamous cell carcinoma, possibly through EMT involving up-regulation of

Snail and consequent aberrant expression of E-cadherin and N-cadherin.²⁰

Prostate cancer

N-cadherin may be involved in the progression of prostate carcinoma from epithelium to mesenchyme; it is likely that N-cadherin mediates a less stable cell-cell adhesion and may allow for carcinoma cell invasion and stromal interactions. N-cadherin mediates adhesion between α -catenin-deficient PC-3N (Prostate cancer) cells and stromal fibroblasts, which contain normal levels of all of the catenins. N-cadherin in PC-3N cells may regulate the cellular outgrowth through cell-cell interactions, which may allow PC-3N to interact with surrounding prostate stromal fibroblasts.²¹ (N L Tran et al 1999).

Meena Jaggi et al (2005), were demonstrated for the first time that N-cadherin switching occurs in higher grade prostate cancer and correlates significantly with increasing Gleason patterns. N-cadherin may be as a useful biomarker of aggressive prostate cancer.²² Formation of N-cadherin junctions promotes 3D (3 dimensional) cell migration of prostate cancer cells, and this is partly due to an aberrant regulation of the N-cadherin complex in the absence of α -catenin. (Y Cui and S Yamada 2013).²³

Lung cancer

A study on non-small-cell lung cancer (NSCLC) suggested that, the frequency of hypervascular tumours was significantly higher for N-cadherin-positive carcinomas than for N-cadherin-negative carcinomas and the 5-year survival rate of patients with N-cadherin-positive tumours was significantly lower than that of patients with N-cadherin-negative tumours.²⁴ (T Nakashima and other's 2003)

Specific tyrosine kinase inhibitors for epidermal growth factor receptor (EGFR), such as gefitinib, have been effective in some NSCLC (Non-small cell lung cancer) patients and are being used in the clinical setting as pioneer molecularly targeted cancer drugs. However, many patients have not responded to these drugs, and have acquired resistance after long-term treatment. Mai Yamauchi et al (2011) suggested that, N-cadherin maintains the survival of the gefitinib-resistant lung cancer cells via the PI-3 kinase/Akt survival pathway. So N-cadherin is a potential molecular target in the treatment of NSCLC.²⁵ Upregulation of N-cadherin in H1650ER (Erlotinib-resistant cell line) cells leads to increased tumor cell migration, invasion and tumorigenic potential. The maintenance of the EMT phenotype in H1650ER cells may be related to the sustained expression of N-cadherin. Therefore, N-cadherin may serve as a promising new target for the treatment of cancers with acquired resistance to EGFR-TKIs (Epidermal growth factor receptor- Tyrosine Kinase Inhibitors. (Xiaoju Zhang et al (2013).²⁶

Urinary system cancer

N-cadherin plays a different role in renal cell carcinoma (RCC) unlike E cadherin and may be associated with the aggressiveness and malignant potential of RCC (Toru Shimazui et al 2005).²⁷ Carl Ludwig Behnes et al (2012) were observed the N-cadherin expression in histological subtypes of papillary renal cell carcinoma and N-cadherin represents the first immunohistochemical marker for a clear cut differentiation between papillary RCC type I and type II and could be a target for therapy and diagnostic in the future.²⁸

N-cadherin was present at cell-cell borders in the very anaplastic cell lines of human bladder carcinoma, observed by Mialhe A and others (2000) and they were indicated that N-cadherin may participate in intercellular adhesion, while facilitating bladder tumorigenesis.²⁹ in bladder cancer, loss or reduced E-cadherin expression has been associated with poor survival, and aberrant expression of N-cadherin has been associated with the invasive phenotype of bladder carcinoma cells. Richard T. Bryana and Chris Tselepisa (2010), were suggested that Cadherin switching is an important process late in the molecular pathogenesis of bladder cancer.³⁰

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CONCLUSION

N-cadherin mediates a less stable cell-cell adhesion and may allow for carcinoma cell invasion and stromal interactions. The loss of E-cadherin expression and gain of N-cadherin expression is called cadherin switching, that is seen during epithelial to mesenchymal transition. Cancer cells derived from epithelium inappropriately express N-cadherin, and the up regulation of N-cadherin expression has been shown to promote motility and invasion. So the maximum expression of N-cadherin by epithelial tumor cells results advanced stage of tumor progression and poor prognosis.

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A Prospective Study of Adverse Drug Reactions During First Six Months of Therapy due to HAART in HIV Infected Patients at a Tertiary Care Hospital in Indore, India

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ABSTRACT

Introduction: Acquired Immunodeficiency Syndrome (AIDS) is a global problem; global statistics till March 2015 revealed that 36.9 million people were living with HIV; where 15 million people accessing antiretroviral therapy. From an antiretroviral perspective, HAART is a potent form of therapy but it often fails owing to non adherence. One way of increasing the adherence is by focusing on prevention of adverse effects wherever possible.

Material and method: This is prospective, observational study conducted at a single ART centre of tertiary care hospital. The adverse drug reactions occurring during first six months following initiation of antiretroviral regimens were observed.

Results: A total of 292 patients were recruited, out of which 132 had shown adverse drug reactions (ADR) to antiretroviral regimen. Out of these, gastrointestinal ADRs were the most common (41%) perceived reactions. A total 64 patients on Zidovudine developed anemia (10%), of which 26 patients required change in regimen. Sixteen patients received Nevirapine developed skin rash (5%) and two patient (0.6%) developed Steven Johnsons syndrome.

Conclusion: Most of the antiretroviral associated ADRs were mild, suggesting a good tolerance to antiretroviral medicines. So, a proper counseling and proper observation during this initial phase could probably increase the adherence of patients with antiretroviral medication.

Keywords: HIV, HAART, adverse drug reaction, anemia, skin rash, nevirapine

ministration for treatment of HIV infection.⁵ Adverse effects due to antiretroviral can be class specific or can be individual drug specific.⁶ Very few prospective studies regarding antiretroviral associated adverse effects are available in Indian Literature,^{2,7,8,9,10} but such data might not be up-to date or the data is not relevant to other medical set-up.

From an antiretroviral perspective, HAART is a potent form of therapy but it often fails owing to non adherence. One way of increasing the adherence is by focusing on prevention of adverse effects wherever possible. Clinician should be able to distinguish serious/life threatening adverse effect from those that are self limited/mild.⁷ Of all the patient initiated on HAART, up-to 25% discontinue their therapy because of treatment failure, toxic effect or non-compliance within first 8 months of therapy.¹¹ Hence, it is very important to monitor and report adverse drug reaction associated with antiretroviral therapy. This study was performed to assess the incidence and pattern of adverse drug reaction associated with antiretroviral therapy in our set-up.

MATERIAL AND METHOD

This is prospective, observational study conducted at ART centre, Department of Medicine, MY Hospital, Indore (M.P). The primary end point was completion of six month follow up, all patients started on first line HAART regimen from June 2013 to March 2014 were screened for recruitment. The study protocol along with the proforma and informed consent was approved by Institutional Ethic Committee before starting. The study proforma contained patient identification data, personal history, family history, treatment history, lab-

INTRODUCTION

Acquired Immunodeficiency Syndrome (AIDS) is a global problem; global statistics till March 2015 revealed that 36.9 million people were living with HIV; where 15 million people accessing antiretroviral therapy. There were 2 million newly HIV infected cases and 1.2 million deaths due to AIDS-related illnesses.¹ Introduction of highly active antiretroviral therapy (HAART) has led to a significant reduction in AIDS related mortality.^{2,3,4} At present drugs belonging to classes of nucleoside reverse transcriptase inhibitors, non-nucleoside reverse transcriptase inhibitors, protease inhibitors, fusion inhibitors, entry inhibitors-CCR5 co-receptor antagonist and HIV integrase inhibitors are approved by Food and Drug Ad-

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oratory investigations, ADR details & its assessment and patient follow up details.

Inclusion criteria

All adult HIV positive patients-

- A) newly registered, started on first line art regimen.
- B) started on first line art regimen, already registered.
- C) having age of after 18-year and Above.

Exclusion criteria

- 1. Seriously ill patient.
- 2. Cancer patients.
- 3. Children below the age of 18 years
- 4. Patient who were suffering from active renal disease, liver diseases and multi-system diseases like diabetes mellitus, hypertension, cardiovascular disease, cerebro-

vascular disease and psychiatry illness.

Essential laboratory investigations such as complete blood count, erythrocyte sedimentation rate, liver function test, renal function test, blood sugars, VDRL, HBsAg, CD4 count. Additional laboratory investigations like chest radiograph, thyroid screen were performed whenever needed.

STATISTICAL ANALYSIS

Descriptive statistical analysis has been used in the present study. However for statistical analysis of qualitative variables Chi square test were performed.

RESULT

A total of 423 patients were screened during study period, out of which 292 were recruited in the study. There were 206 males, 84 females and 2 transgender in the study.

Gender wise and age group wise distribution of HAART regimen has been described in Table 1 and Table 2, respectively. Most number of the patients received ZLN (43%) as a first line HAART and ZLE (24%), TLN (16%) and TLE (13%). One patient received SLN. According to the age, maximum number of the patients distributed between 18 to 49 years of age. 108 patients were between 30-39 years of age, of which 40 developed ADRs. A total of 66 and 78 patients between age group 18-29 and 40-49 of which 34 and 36 patients respectively developed ADRs.

Distribution of adverse drug reaction according to the regimen has been given in Table 3.

Gastrointestinal ADRs were the most common perceived reactions, 102 patients developed this (41%) ADRs, of which nausea and vomiting were most common. A total 64 patients on Zidovudine developed anemia (10%), of which 26 patients required change in regimen. Sixteen patients received Nevirapine developed skin rash (5%) and two patient (0.6%) developed Steven Johnsons syndrome.

Distribution of ADRs according to CD4 counts have been

	Patents with ADRs	Patients with no ADRs	Percent of patient ADRs	Total
Female	42	42	50%	84
Male	90	116	44%	206
Transgender	0	2	0	2
Total	132	160		292

Sex * ADRs group Cross tabulation

Table-1: Gender and ADRs distribution in patients on ART

Age group and ADRs group distribution					Percent
		ADRs Group		Total	
		Reported ADRs	No ADRs		
age group (years)	18-29	36	32	68	52
	30-39	42	68	108	39
	40-49	38	42	80	47
	50-50	12	10	22	54
	≥60	4	8	12	33
Total		132	160	292	

Table-2: Age group and ADRs distribution

ADRs	ZLN	ZLE	TLN	TLE	Others	
Abdominal pain	4	2	0	6	0	12
Anemia	22	8	2	0	0	32
Constipation	2	0	2	0	0	4
Deranged amylase	0	2	0	0	0	2
Deranged liver function	4	0	2	0	0	6
Diarrhea	2	4	2	4	0	12
Dizziness	2	0	4	0	0	6
Dyslipidemia	8	4	2	0	0	14
Fever	4	4	0	0	0	8
Gastritis	6	2	0	0	0	8
Generalized body ache/myalgia	2	0	0	0	0	2
Leg swelling	8	0	0	0	0	8
Nausea, vomiting	20	22	4	8	2	58
Skin rash	10	0	4	2	0	16
Steven Johnsons syndrome	2	0	0	0	0	2

Table-3: ADRs distribution with ART regimen

represented in table 4, we could not find any statistical significant relation of ADR with CD4 counts (Pearson Chi-square $p=0.33$).

DISCUSSION

The likelihood of developing an adverse drug reaction was highest in the first six months of commencing antiretroviral therapy. Xavier et al.¹² proffered an explanation that early occurrence of ADRs is an expression of a Mechanism of intrinsic intolerance rather than of a time-dependent toxic accumulation process. Close monitoring of patients within this time frame is thus imperative to prevent the occurrence of severe ADRs, improve adherence as well as improve documentation of ADRs.

However 45% of the reported ADRs occurred within 12- 24 months of commencing ARTs. This calls for the need to intensify long term ADR monitoring in patients on ART. Some studies have proposed time-dependent toxic accumulation as the mechanism of developing an ADR long after commencing medication. Thus monitoring for ADR should be an ongoing process. Adding a laboratory component to the ADR screening would go a long way in determining biochemical markers that would help to improve patient management.

Since adverse drug reactions are the single most common reason for poor adherence to treatment, identifying risk fac-

tors for the occurrence of ADRs is of crucial importance to optimize the initial choice of ARTs regimen before initiating therapy and to adapt the pace of surveillance to each unique situation.¹²

In our study greater proportion of women participants experienced ADRs, compared to men, similar to other studies conducted Bonfati et al.¹³ Though the population of patients on Stavudine based regimen was small, compared to AZT and TDF, our data shows that patients on AZT were likely to report an ADR than those on TDF. A multisite trial in Africa, found tenofovir therapy to be associated with 1.3% risk of developing significant nephrotoxicity which was comparable to other regimen,¹⁴ but in our study no significant nephrotoxicity was observed. A closer look at the drug profile and toxicity of TDF is urgently needed to better understand its tolerance in patients in this setting.

Gastrointestinal side effects were most commonly reported (52%), mild to moderate in severity and required no change in first line ART regimen. Incidence of anemia was low at 4% and occurred exclusively in patients on AZT. This is similar to other studies conducted in Nigeria, Co^t d'Ivoire, Haiti and India that observed anemic rates of 3%-12%.^{7-10,14} Most of the reported ADRs (71%) were mild to moderate and self limiting in nature. This suggests good tolerance level to ARTs in general.

While other studies have associated low CD4 count at treatment initiation as a risk factor for ADR,¹⁴ our study did not show any association between CD4 cell count and clinical stage with ADRs.

This study has some limitations. The study was shorter in duration and since this study provided information on short term adverse effects, we may have missed late onset ADRs in these patients. The small sample size of patients on Stavudine based regimen limits our ability to compare ADR reported by this group with other regimen groups.

Major adverse effect found in our study has been compared

CD4 counts	Total number of patients	Patients developed ADRs	Percent
0-49	19	8	42
50-99	15	8	53
100-199	43	23	53
200-349	48	26	54
≥350	21	13	61

Table-4: CD4 counts and ADRs distribution

Characteristics	Our study	Lihite et. al. ⁸	Bhatnagar et.al. ⁹	Divakar et.al. ²	Bhuvana et.al. ¹⁰	Sharma et.al. ⁷
Follow-up duration (in months)	6	-	18	8	6	24
total subjects studied	292	300	129	400	158	90
Subjects with adverse reaction (%)	45	31	75	27	-	71
Male/Female with adverse reaction	90/42	70/23	-	64/36 (no of adverse events)	80/78	90/64
Gastro-intestinal adverse reaction	35% (102/292)	17% (50/300)	30%	6.2% (26/400)	10% (17/158)	20% (18/90)
Skin rash	5% (16/293)	13% (38/300)	24%	6.2% (26/400)	25% (40/158)	10% (9/90)
Steven Johnson Syndrome	0.6% (2/292)	0.6% (2/300)	-	1% (4/400)	-	3.3% (3/90)
Anemia	10% (32/292)	5.3% (16/300)	28%	6.5% (26/400)	55% (87/158)	20% (18/90)
Relation of adverse reaction to CD4 count	No relation found	-	More in CD4 count <200 cells/mm ³	-	More in CD4 count <250 cells/mm ³	-

Table-5: Comparison of major adverse effect found in our study with other recently performed, prospective, Indian studies

with other recently performed, prospective, Indian studies in Table 5.

CONCLUSION

This study provides information about adverse events occurring during short, but crucial initial six months of initiation of HAART. We have found that age group of 18 to 49 years was maximally affected; also gastrointestinal adverse events were most common. Important to note that most of the HAART associated ADRs were mild, suggesting a good tolerance to antiretroviral medicines. So, a proper counseling and proper observation during this initial phase could probably increase the adherence of patients with antiretroviral medication.

ABBREVIATIONS

AIDS - Acquired Immunodeficiency Syndrome,
 HAART - Highly active Antiretroviral Therapy,
 ARD - Antiretroviral (drug),
 AZT - Zidovudine (also known as ZDV),
 CD4 - T-lymphocyte CD4+,
 GI - Gastrointestinal,
 HIV - Human Immunodeficiency Virus,
 NVP - Nevirapine,
 ZLE - Zidovudine + Lamivudine + efavirenz,
 ZLN - Zidovudine + Lamivudine + Nevirapine,
 TLN - Tenofovir + Lamivudine + Nevirapine,
 TLE - Tenofovir + Lamivudine + Efavirenz,
 SLN - Stavudine + Lamivudine + Nevirapine,
 TDF - Tenofovir Disoproxil Fumarat

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A Study of Relation between Thyroid Dysfunction and Diabetes Mellitus among Cases Attending a Tertiary Care Hospital of South Karnataka

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ABSTRACT

Introduction: Diabetes mellitus and thyroid diseases are two common endocrinopathies seen in the general population. The aim of the present study was to study the relation between thyroid dysfunction and diabetes mellitus among the diabetic patients attending Kasturba Hospital, Manipal.

Materials and Methods: A retrospective case control study was conducted among 124 diabetic patients who attended Kasturba Hospital, Manipal, a tertiary referral hospital of south Karnataka. The diabetic patients with normal thyroid functions were considered as control subjects and diabetic patients with abnormal thyroid functions as cases.

Results: The proportion of hypothyroidism among diabetic females was higher than in males in the study population. There was a significant risk for development of hypertension among the diabetic patients having thyroid dysfunction. There was no significant association between diabetic complications and thyroid dysfunction. There was no significant association between thyroid dysfunction and lipid profile, protein and creatinine levels in diabetic patients.

Conclusion: The ability to diagnose and treat unsuspected thyroid dysfunction in diabetic populations may result in better control of the diabetes, hypertension as well as of the dyslipidaemic states, thereby greatly enhancing the quality of life.

Keywords: Hypothyroidism, Hyperthyroidism, Endocrine, Hypertension

absence of thyroid dysfunction among diabetic patients. The reported prevalence of thyroid dysfunction in diabetes varies from 2.2 to 17%.⁵

The present investigation is an attempt to study how thyroid function affects diabetes and glycemic control. It is also of interest to assess how both the disorders superimposed could affect the lipid parameters, and thereby the general well being of the individuals. The aim of the present study is to study the relation between thyroid dysfunction and diabetes mellitus among the diabetic patients attending Kasturba Hospital, Manipal.

Objectives of the research were to compare the complications in diabetic patients with and without thyroid dysfunction and to study thyroid function status, in relation to the age and sex, fasting lipid profile, HbA1c, serum creatinine levels, serum total protein and albumin values.

MATERIALS AND METHODS

A retrospective case control study was conducted among 124 diabetic patients who attended Kasturba Hospital, Manipal, a tertiary referral hospital of south Karnataka. The diabetic patients with normal thyroid functions were considered as control subjects and diabetic patients with abnormal thyroid functions as cases.

Inclusion criteria

1. All diabetic patients who visited as outpatient or inpa-

INTRODUCTION

India is home to 50.8 million diabetics, making it the world's unchallenged diabetes capital.¹ Diabetes mellitus is a metabolism disorder. Diabetes mellitus and thyroid diseases are two common endocrinopathies seen in the general population. Insulin and thyroid hormones are intimately involved in cellular metabolism and thus, an excess or deficit of either of these hormones could result in the functional derangement of the other.

The prevalence of thyroid disease in patients with diabetes is significantly higher than that in the general population. It has been reported as 13.4%, with the highest in patients with type 1 diabetes (31.4%)² and lowest in patients with type 2 diabetes (6.8%).^{3,4} The association between diabetes mellitus and primary hypothyroidism is well recognized and a lot of studies in different countries have tried to estimate the prev-

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tient to Kasturba Hospital, Manipal were selected on the basis of their blood sugar values (fasting sugar level >126 mg/dl and postprandial level >200mg/dl).

- In addition to this, diabetics with or without thyroid dysfunction were chosen. The thyroid function is considered to be abnormal when the TSH, T₃ and T₄ values are increased or decreased from the normal range (Normal ranges for TSH: 0.3- 4.5 UIU /ml, T₃: 0.8 – 2 ng/ml and T₄: 4.5 -12 g/ dl).

Exclusion criteria:

- Non-diabetic patients with abnormal thyroid functions were not selected for the study.

METHODOLOGY

After obtaining permission from the Hospital Authorities and from the Institutional Ethical Committee, the records of the diabetic patients with and without thyroid disorder who attended the hospital from January 2010 to July 2011 were reviewed. List of cases fulfilling the eligibility criteria was made. 68 diabetics without thyroid disorder and 56 diabetics with thyroid disorder were included in this study depending on availability of their serum values and the diagnosis in the medical records.

A semi-structured proforma was used to collect the details of the patients. Data on fasting lipid profile, HbA1c, serum creatinine levels, serum total protein and albumin values of these patients were collected from their clinical records. Medical history regarding the age at diagnosis of diabetes, the presence of cardiovascular disease, the presence of diabetic complications, and current medication, were obtained

from the medical records of the patients.

STATISTICAL ANALYSIS

Data analysis was done using SPSS v16.0 (SPSS South Asia, Bangalore). Categorical data was expressed as frequency and percentage. Risk estimation was done between cases and control by using Odds ratio. Non-parametric test (Mann-Whitney test) was used to analyse the continuous data among cases and control to find the association. The significance level (p value) of 0.05 was taken as critical value to see the difference between the mean values of cases and controls.

RESULTS

124 known and newly diagnosed diabetic patients were considered for this study. Out of the 124 subjects, 65 were male and 59 were female. All subjects were type 2 diabetics. The mean age of the sample was 55.8 years. The average duration since detection of diabetes was 8 years. Among 124 patients, 56 had thyroid dysfunction, out of which 12 (9.7%) had hyperthyroidism and 44 (54.8%) had hypothyroidism. Among the patients included in this study, 39 (31.5%) had ischaemic heart disease, 21 (16.9%) had retinopathy, 16.1% had neuropathy and 8.9% had nephropathy. In the study group, i.e., patients with hypothyroidism and diabetes (56 cases), majority of them were females – 32 (54.2%).

Table 1 depicts the comparison of categorical parameters between cases and control subjects. There is a higher proportion of hypertension among the cases when compared to that of the control group (76.8% against 58.8%). Therefore,

Parameter	Cases (n=56)	Control (n=68)	Odd's Ratio	95% confidence interval
HTN	43 (76.8%)	40 (58.8%)	2.315	1.055, 5.082
Hypoglycaemia	3 (5.4%)	1 (1.5%)	3.792	0.383, 37.513
Ketoacidosis	3 (5.4%)	1 (1.5%)	3.792	0.383, 37.513
Neuropathy	10 (17.9%)	10 (14.7%)	1.261	0.484, 3.287
Nephropathy	5 (8.9%)	6 (8.8%)	1.013	0.292, 3.512
Retinopathy	11 (19.6%)	10 (14.7%)	1.418	0.553, 3.632
CVA	2 (3.6%)	3 (4.4%)	0.802	0.129, 4.979
IHD	17 (30.4%)	22 (32.4%)	0.911	0.425, 1.955
PVD	4 (7.1%)	5 (7.4%)	0.969	0.247, 3.796

Table-1: Comparison of categorical parameters between cases and control

Parameter	Hyperthyroidism (n=12)	Hypothyroidism (n=44)	None (n=68)	p value
HbA1c	8.2 (6.5, 9.3)	7.9 (6.975, 10.22)	9.15 (7.57, 12.4)	0.042
TC	153 (125.75, 189.5)	171.5 (144.25, 204)	169 (142.5, 199.75)	0.436
TAG	113 (73.75, 197)	134 (95, 163)	137.5 (98.25, 195)	0.514
HDL-C	38 (33.75, 56.5)	43 (33, 48)	31 (24.24, 39)	0.000
LDL-C	37.8 (74.3, 105.25)	95 (79.6, 123.2)	110.6 (85.2, 125.4)	0.120
TP	6.5 (5.95, 6.825)	7.4 (6.625, 7.8)	6.9 (6.6, 7.3)	0.002
Albumin	4 (3.8, 4.1)	4 (3.62, 4.27)	4.2 (3.925, 4.475)	0.035
Creatinine	0.8 (0.6, 0.9)	1 (0.7, 1.2)	0.85 (0.725, 1.1)	0.203
Urea	27.5 (20.5, 34.75)	24.5 (17, 39.25)	25 (21, 41)	0.527

Table-2: Association between thyroid dysfunction and biochemical parameter (Median and Inter Quartile Range)

there is a higher risk for development of hypertension among diabetics with thyroid dysfunction than those with euthyroid status (Odd's ratio=2.315).

In this study, glycated haemoglobin (HbA1c) value was found to be high in both cases and control and was statistically significant ($p=0.042$). The value is higher in patients having diabetes with normal thyroid function (HbA1c=9.15%) than in those having thyroid dysfunction (HbA1c=8.2%). There is no significant correlation between thyroid dysfunction and lipid profile, protein and creatinine levels in diabetic patients (as shown in Table 2).

DISCUSSION

While the prevalence of thyroid diseases in the general population has been quoted in literature as 6.6%, that among diabetics is as high as 10.8%.⁶ Hyperthyroidism has been known to affect glucose homeostasis resulting in hyperglycaemia and worsening of glycaemic control in diabetics.^{7,8,9} However, in the present study, we have obtained results that negate this statement. In our study, it has been shown that the glycaemic control is actually worse in patients with no thyroid dysfunction. This is probably due to the smaller sample size that was employed in the study.

Also, thyroid dysfunction has a propensity to cause lipid dysregulation, as evidenced in several studies.¹⁰ But, in the current study, the presence of thyroid disorders has not caused a significant LDL increase. HDL has been found to be lower in the population with euthyroid status, rather than in the subset with thyroid dysfunction.

CONCLUSION

Several studies, including ours, have shown that thyroid disorders and diabetes mellitus can co-exist in the clinical scenario. The incidence of hypertension has been found to be significantly higher in diabetics who also have thyroid dysfunction. Hence, early diagnosis and management of hypertension is essential in such patients. The ability to diagnose and treat unsuspected thyroid dysfunction in diabetic populations may result in better control of the diabetes as well as of the dyslipidaemic states, thereby greatly enhancing the quality of life.

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A Comparative Study of Two Methods Quantitative Assessment and Alkaline Hematin Method to Estimate Blood Loss During Third Stable of Labour

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ABSTRACT

Introduction: Opinion and expertise of a specialist is very much needed during third stage of delivery and to minimize the blood loss and its consequences. Timely intervention is essential to mitigate the problem. There is no uniform and common agreement regarding the amount of blood loss is to be taken as criteria to say PPH. As the percentage of blood loss increases proportionately the risk of complications will increase. Objectives of the study were to estimation of blood loss during third stage of labour and to comparison of blood loss by quantitative assessment with optical density method.

Materials and Methods: 200 cases of normal pregnant women who came to Niloufer Hospital for delivery were included during the study. Estimation of blood loss through collection and optical density method was done and both were compared. Patient wise data compiled and analyzed by taking variables like age, parity, weight of the mother and baby and blood volume.

Results: Wide variations were observed in both methods. Average (90 ml measured) 190 ml alkaline hematin method. The blood loss by alkaline hematin method was found to be almost double than the blood loss by the measured loss.

Conclusion: Blood loss by alkaline hematin method was found to be almost double the measured loss and it is more accurate estimation of blood loss and under estimation of measured blood loss is emphasized. Though this method is accurate and it can't be used routinely for estimation of blood loss.

Keywords: Post Partum Hemorrhage (PPH), Alkaline Hematin (AH), PCV, Hb%

INTRODUCTION

Cool, organized thinking and expertise judgment of obstetrician are essential to reduce PPH related complications during the time of delivery especially in third stage of labour. PPH is one of the common causes for maternal complications. Sudden onset of complications is the reasons for helplessness of obstetricians. The definition and amount of blood loss in PPH, there is no uniformity and agreed policy in the literature.

In the standard text books of OBG, the blood loss of more than 500 ml by vaginal delivery and 1000ml in cesarian section is taken as a criteria to describe PPH.

Methods of measuring blood loss have been summarized by

Wilcoxon et al¹(1924):

Direct measurement 2. Photoelectric technique 3. Gravimetric procedure 4. Volumetric method²

Since Spectro photo electric method appears to be most accurate, one of the alkaline hematin method was chosen for use in this study. Aim and Objectives of the study were to estimation of blood loss during third stage of labour and to comparison of blood loss by quantitative assessment with optical density method.

MATERIALS AND METHODS

Two hundred normal pregnant women were booked for estimation of blood loss at Niloufer Hospital. The following data was taken for every patient:

Weight in kg 2. Hb% Sahli's method, 3. PCV by microcapillary method

About 0.04 ml of peripheral blood was taken by Hb pipette in 4 ml of 5% NaOH solution. This is standard solution used for calculation of blood loss by alkaline hematin method. After delivery of the patient blood was collected in a basin and then measured in a 100 ml of graduated jar. This amount of blood was poured in 2000 ml of 5% NaOH solution in a plastic bucket. (5% NaOH was prepared by adding 100 gms of NaOH pellets in 2000 ml of distilled water)

In addition to the measured blood poured into the NaOH solution, the apparatus used to collect the blood was rinsed in the solution. All the pads and clots and swabs were also soaked and squeezed thoroughly in NaOH solution. One hour after delivery, the soaked perineal pads and all the clots which were obtained after exploring the uterus were also soaked and squeezed in NaOH solution. About 10 ml of above solution was taken and centrifuged for 10 minutes at 3000 rpm. This is the unknown used to calculate the blood loss by optical density method.

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One hour after delivery general condition of the patient was noted by taking pulse rate, pallor, BP and also enquired about how they felt.

To calculate the blood loss by alkaline hematin method²:

The optical density of standard and unknown is determined at 530 nm. The blood loss was calculated by using the formula:

Blood loss = Optical density of unknown x 2000 / optical density of standard x 100

To calculate the percentage of total blood volume lost at delivery is calculated by the formula:

0.036 x estimated blood loss x observed hematocrit/body weight

RESULTS

Table 1 shows relation of blood volume to blood loss. Blood volume was taken in 5 ranges starting from 3000 to 5500ml of blood. Blood volume ranging from 3000-5500 ml showed decrease in blood loss i.e., 120-83 (measured) 270-190 (AH). Table 2 shows age wise blood loss. No significant relation was observed in blood loss with age.

Body weight ranging from 40 to 60 kg showed slight increase in blood loss with increasing weight of the mother.

Table 4 shows the relationship between parity to amount of blood loss during delivery. As increase of parity, proportionately blood loss also increased.

Table 5 shows blood loss in relation to weight of the baby. It has increased with increasing of baby weight.

Table 6 shows the relationship between normal and abnormal cases of delivery. Delivery done other than vaginal was considered as abnormal. Blood loss is more in abnormal cases compared to normal in both the methods.

Table 7 shows the relationship between PCV and blood loss. PCV range is taken from 27 to 40 and observed relationship with increase of PCV to blood loss. No changes seen with relation to PCV in blood loss.

Table 8 shows relation of Hb% with blood loss. No relation to blood loss is observed with Hb%.

DISCUSSIONS

In the present study, blood loss in third stage of labour in 200 cases was done by quantitative assessment and alkaline hematin method and compared. Previous studies showed wide individual variations in blood loss by various methods. Blood loss in normal pregnant women was measured in 200 cases. Since spectro photo electric method of measuring blood loss appeared to be most accurate. One of these is alkaline hematin method was chosen for use in this study and compared with measured blood loss.

This method was first used to measure menstrual blood during menstrual cycle by Hallbegg and Nelson (1964) and further evaluation of this method was done by S.T.Shaw, Aurenson^{3,4} (1972) and found most accurate. Previous studies

S.NO	Mother's blood volume (ml)	No of cases	Blood loss-measured MI	Blood loss-alkaline method MI
1	3000-3500	18	91.44	194.01
2	3501-4000	66	120.43	272.67
3	4001-4500	57	111.40	263.46
4	4501-5000	36	103.9	240.53
5	5001-5500	16	83.75	190.12

Table-1: Relation of blood volume to blood loss

S.NO.	Age in years	No of cases	Blood loss-measured MI	Blood loss-ah MI
1	15-20	21	92.31	213.31
2	21-25	55	95.89	22.54
3	26-30	112	118.54	258.4
4	31-35	12	88	285.16

Table-2: Relation of age to blood loss

S.NO	Mother's body weight in kgs	No of cases	Blood loss-measured ml	Blood loss ah method ml
1	40-45	31	97.55	222.47
2	46-50	80	114.41	236.25
3	51-55	46	120	268.2
4	56-60	28	103.5	279.6
5	60+	16	84.3	205.5

Table-3: Relation of mother's body weight and blood loss

S.NO	Parity	No of cases	Blood loss-measured ml	Blood loss ah method ml
1	1	46	106.42	247.61
2	2-4	121	100.17	246.7
3	5+	30	112.85	273.34

Table-4: Relation of parity to blood loss

S.NO	Baby weight in kgs	No of cases	Blood loss measured (ml)	Blood loss ah method ml
1	2-2.5	64	94.03	216.4
2	2.6-3	108	110.9	254.4
3	3.1-3.5	20	113.75	307.24
4	3.6-4	8	195	388.45

Table-5: relation of baby weight to blood loss

S.NO	Type of delivery	Blood loss-measured ml	Blood loss ah method ml
1	Normal	90	190
	Abnormal cases		
2	Instrumental	163.33	346.99
3	Post caesarian	193.33	438.6
4	Accelerated labour	128.0	379.6
5	Malpresentation	110	289.75

Table-6: Relation of blood loss in normal and abnormal cases

S.NO.	PCV	No of cases	Blood loss-measured	Blood loss-AH
1	27-28	2	100	234
2	29-30	11	110.55	266
3	31-32	52	166.8	204.4
4	33-34	68	127.35	306.11
5	35-36	49	114.96	271.61
6	37-38	16	78.60	163.72
7	39-40	2	66.67	148.95

Table-7: Relation of packed red cell volume to blood loss

S.NO.	Hb Gm%	No of cases	Blood loss-measured	Blood loss-AH
1	8-9	4	68.75	163.18
2	9.1-10	6	98.82	211.48
3	10.1-11	108	116.28	280.54
4	11.1-12	65	113.69	253.14
5	12.1-13	17	55	118.59

Table-8: Relation of hemoglobin to blood loss

noted very wide individual variations in blood loss by various methods. Same thing was observed in the present series with a loss ranging from 30-400 cc. Average about 90 ml by measurement and 190 ml by alkaline hematin method. It has been shown that blood loss by alkaline hematin method is almost double the measured loss and it is more correct estimation of blood loss. Thus the clinical importance of this under estimation of blood measured blood loss is emphasized. Though this method appears to be more accurate and reproducible but it is not practicable for routine estimation.

Since there is considerable variation between patients in the amount of blood loss it seemed worthwhile to enquire further into possible causes. There is undoubtedly many factors that may affect blood loss even in apparently normal women. No obvious effects due to age, race and antepartum care etc., were noted by Dr Newton from the present series no affects due to age, PCV, Hb% were noted but Grand multipara, Grand multies i.e., para 5 and above showed an increase in blood loss.

A definite effect of episiotomy was also noted by Michael Newton⁷, this might be the cause of blood loss in primies in present series as all of them were given medio-lateral episiotomy. Specific obstetric factors implicated by Connetal included weight of the baby, prolong labour, ill judged sedation, weight of the placenta in this series as baby weight increase blood loss also showed an increase. Other factors were not observed.

According to Michel Newton 1961^{8,9}, operative delivery by use of forceps did not appear to contribute to blood loss. It might be assumed that any excess bleeding in this incidence is due to episiotomy. That is always required. In this series forceps deliveries showed an increase of blood loss as explained by Newton this might be due to episiotomy. According to Abraham Shulman,¹⁰ an estimated loss of 10% of total blood volume may be considered as PPH although the clinical symptoms may not be apparent.¹⁰

CONCLUSION

About 200 cases of normal pregnant women were booked. Blood loss was measured by 2 methods qualitative and alkaline hematin method and both were compared. The percentage of total blood volume lost showed a wide variation from 0.5 to 10% in normal cases. It was shown that patients with lesser blood volume develop features of hemorrhage with less amount of blood loss or in other words patients with higher blood volume can withstand better a certain amount of blood loss than a patient with low blood volume. So it is better to improve the socio-economic status of the patient.

Thus blood loss by alkaline hematin method was found to be almost double the measured loss and it is most accurate estimation of blood loss and under estimation of measured blood loss is emphasized. Though this method is accurate it can't be used routinely for estimation of blood loss.

Blood loss and its relation to various factors have been noted and it was found that it is not dependent on age, PCV, Hb% but showed increased loss increase of mother's body weight and baby, abnormal deliveries etc.,

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Relation between Body Mass Index (BMI) and Fasting Blood Sugar (FBS)

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ABSTRACT

Introduction: Increased energy intake leads to increased fat delivery from either exogenous fat in the diet or endogenous fat from hepatic lipogenesis to muscle and liver resulting in increased fat storage in these tissues and insulin resistance. Aim of the study was to establish the relationship between fasting blood sugar and body weight.

Materials and methods: The subjects for the study are 100 males in the age group of 21 to 40 years. Control group of 50 males had BMI of 18-24 kg/m² and study group of 50 males had BMI of 25-29kg/m². Height and weight are recorded. Ethics committee consent was taken. Study group excluded people on treatment for diabetes mellitus and cardiovascular diseases. Biochemical Analysis: The patient was asked to fast overnight for 8-10 hours. Fasting Blood Sugar was estimated by Glucose Oxidase method.

Result: The triad of obesity, diabetes and heart diseases are interlinked and are proving the major cause for the morbidity and mortality in the world population. All stages of glucose abnormalities like prediabetes and established diabetes mellitus are associated with CAD and detection of these abnormalities is of great value in early screening of cardiovascular diseases

Conclusion: The existence of a significant direct correlation between FBS and BMI was confirmed in the present study. Our results therefore suggest that a low BMI is important for maintaining normal blood glucose levels.

Keywords: Body mass index (BMI), Fasting blood sugar (FBS), Obesity Cardio vascular disease (CVD)

INTRODUCTION

There has been a renaissance in the field of obesity research in the last ten years. Traditionally, obesity was believed to be associated with affluent lifestyles in the west. Now, however, the picture has changed & research in the field of obesity has blossomed. Obesity is increasing at an alarming rate throughout the world. Several studies in India have shown that changes in dietary patterns, physical activity levels, lifestyles associated with affluence and migration to urban areas are related to increasing frequencies of obesity. The role of vitamin fortification leading to obesity is becoming more prevalent in recent days.¹

Obesity is an epidemic disease that threatens to inundate health care resources by increasing the incidence of diabe-

tes, heart disease, hypertension and cancer. All obese individuals do not display a chastening of metabolic & cardiovascular risk factors and all lean individuals do not present with a healthy metabolic & disease - free profile. But most of the time obesity is associated with abnormal glucose and lipid profiles. Studies indicate that the presence of obesity increases the risk for developing diabetes and cardiovascular diseases.²

In obesity as excessive adipose tissue accumulates, an altered metabolic profile occurs along with a variety of adaptations and alterations in cardiovascular structure and function even in the absence of co-morbidities.

Adipose tissue excess or obesity, particularly in the visceral compartment, is associated with insulin resistance, hyperglycemia, dyslipidemia, hypertension, and prothrombotic and proinflammatory states. The most common cause of insulin resistance occurs when energy intake exceeds the metabolic rate leading to obesity.

Increased energy intake leads to increased fat delivery from either exogenous fat in the diet or endogenous fat from hepatic lipogenesis to muscle and liver, resulting in increased fat storage in these tissues and insulin resistance. Fatty acid synthesis in the body can also occur from increased carbohydrates like glucose.³

Circulating insulin levels are elevated and correlate inversely with insulin receptor number. If insulin levels are lowered for example by diet or drugs that interfere with insulin secretion, the receptor number returns to normal even though the degree of obesity may not be significantly changed. This suggests that the number of insulin receptors in insulin resistant obese patients may result from the effects of excess insulin on normal pathway of receptor down regulation. The observation that insulin receptor number can be restored to normal if insulin levels are decreased in obese patients suggests that the changes in receptor number are secondary to the insulin resistance and not a primary causal factor.

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Type II diabetes mellitus is strongly associated with overweight in both genders in all ethnic groups.⁴

Smith et al found that human adipocytes with proper invitro conditions will take up glucose and enlarge their fat content. Insulin sensitivity is inversely correlated with cell size.⁵

Through the use of BMI the epidemic of obesity that began in the 1980s has been tracked through the end of the century. The original alarm was sounded in 1994 by the National center for health statistics in USA when they reported the data from the National health and Nutrition Examination survey (NHANES).

In recent years, the body mass index(BMI) has become the medical standard used to measure overweight and obesity. BMI can be considered to provide the most useful, albeit crude population - level measure of obesity. Men and women with a BMI of 25.0 to 29.9 kg/m² are considered overweight, and those with a BMI 30 kg/m² or greater are considered obese. The prevalence of obesity - related diseases, such as diabetes, begins to increase at BMI values around 25 kg/m². Obese persons with excess abdominal fat are at higher risk for diabetes, hypertension, dyslipidemia, and ischemic heart disease than obese persons whose fat is located predominantly in the lower body⁶

In obese adults, type 2 diabetes develops over a long period, and impaired glucose tolerance can be a predictor for the risk of development of diabetes and cardiovascular disease.⁷

FBS < 100 mg/dl is considered normal and between 100–125 mg/dl along with Hb A1C 5.7%-6.4% is marked as impaired fasting glucose or prediabetes. FBS ≥ 126 mg/dl along with Hb A1C ≥ 6.5% is defined as diabetes mellitus.⁸

It has been recognized that prediabetic hyperglycemia -fasting plasma glucose of 110 to 125 mg/dl confers an increased risk for cardiovascular disease.⁹ The prevalence of diabetes and prediabetes are known to relate with higher range of waist circumference, waist /hip ratio and body mass index.¹⁰ According to ADA guidelines, the risk factors for diabetes are:-

- Physical inactivity
- First-degree relative with diabetes
- High-risk race/ethnicity
- Women who delivered a baby >9 lb or were diagnosed with gestational diabetes mellitus
- HDL-C <35 mg/dL ± TG >250 mg/dL
- Hypertension (≥140/90 mm Hg or on therapy)
- Hb A1C ≥5.7%
- Conditions associated with insulin resistance: severe obesity, acanthosis nigrica, and

Present study was under taken to emphasize the relation between BMI >25kg/m² and fasting blood sugar.

MATERIALS AND METHODS

The subjects for the study were 100 males in the age group of 21 to 40 years. Control group of 50 males had BMI of 18-24 kg/m² and study group of 50 males had BMI of 25-29kg/m².

Height and weight are recorded. Ethics committee consent was taken.

Study group excluded people on treatment for diabetes mellitus and cardiovascular diseases.

The commonly employed measurements and calculations are as follows

Height: standing height is measured using a stadiometer, with an accuracy of 0.1 cm graduations and sliding head-piece. The measurement is taken with the subject wearing no shoes, standing erect on a horizontal surface with heels together, the shoulders relaxed and arms at the sides.

Weight: weight assessment provides important data in assessing status of an individual and serves as an indicator of intentional or unintentional weight loss.

Body weight = body fat + lean body mass (fat free mass).

BMI (Body Mass Index) or Quetelet Index:-

It is a statistical measure of the weight of a person scaled according to height. It is used as a simple means of classifying inactive individuals of an average body composition according to their body fat content. It was originally developed between 1830 and 1850 by the Belgian polymath, Adolphe Quetelet during the course of developing Social Physics.

It is a reliable and easily obtainable objective anthropometric criterion for the definition and diagnosis as well as an estimate of the severity of undernutrition or chronic energy deficiency (CED) in adults.¹¹

BMI was calculated from the following equation

$$\text{Body Mass Index (kg/m}^2\text{)} = \frac{\text{Weight in Kg}}{\text{Height in m}^2}$$

The Body Mass Index value ranging between 18.5 -25.0 is considered as normal, < 18.5 indicates the status as undernourished, while value above 25 as overweight and above 30.0 as obese.

Biochemical Analysis:- The patient was asked to fast overnight for 8-10 hours. Fasting Blood Sugar was estimated by Glucose Oxidase method.

RESULTS

Paired T test is done . Results show that 40/50 subjects with BMI<25kg/m² have FBS of <100mg/dl (Graph-1). 38/50 Subjects with BMI of >25kg/m² have FBS of >100mg/dl. (Graph-2) Significant p value is seen. The study shows that Body Mass Index is directly related to Fasting Blood Sugar.

DISCUSSION

The triad of obesity, diabetes and heart diseases are inter-linked and are proving the major cause for the morbidity and mortality in the world population.

Diabetes mellitus is one of the leading risk factors of Coronary Artery Disease and is growing in developing countries because of the changes in lifestyles, increasing high-calorie diet and physical inactivity.¹¹ Obesity, diabetes mellitus and

BMI Kg/m ²	FBS<100 mg/dl	FBS>100 mg/dl	Total
BMI<25	40	10	50
BMI>25	12	38	50
Total	48	52	100

Table-1: Comparison of BMI with fasting blood sugar

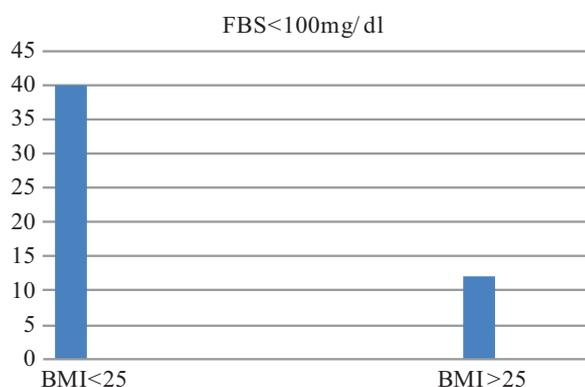


Figure-1: BMI versus FBS

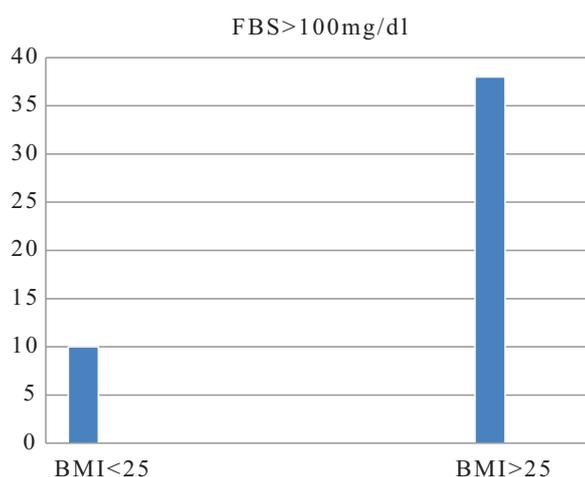


Figure-2: BMI versus FBS

hypertension are common, interrelated medical problem in westernized, industrialized societies

All stages of glucose abnormalities like prediabetes and established diabetes mellitus are associated with CAD and detection of these abnormalities is of great value in early screening of cardiovascular diseases.^{12,13}

Patients put on hypolipidemic drugs like fenofibrate are known to show increased insulin sensitivity thereby effecting glycemic control of the patients.¹⁴

Elevated fasting serum glucose level and a diagnosis of diabetes are independent risk factors for several major cancers and the risk tends to increase with an increased level of fasting serum glucose.

Recent studies point towards RESISTIN. Resistin is an adipokine secreted from adipose tissue and monocytes. It is named for its ability to resist or interfere with insulin action It was proposed as a link between obesity and diabetes.^{15,16}

In obese individuals, adipose tissue releases increased

amounts of non-esterified fatty acids, glycerol, hormones, pro-inflammatory cytokines and other factors that are involved in the development of insulin resistance.¹⁷

The life style of present generation adolescents makes them more prone for obesity and diabetes. Early detection and therapy of the obese adolescent with a family history of type 2 diabetes may interrupt the cycle of weight gain and insulin resistance that leads to glucose intolerance in adulthood.¹⁸

Studies show that therapy with extended release niacin may increase fasting blood sugar into the diabetic range, especially for obese patients.¹⁹

Our study is done to re-establish the direct relationship between increased body weight and fasting blood sugar. In the control group of BMI <25, majority of people showed fasting blood sugar of less than 100mg/dl (Graph-1). In the study group with BMI>25, majority of people showed FBS >100mg/dl (Graph-2). As we have excluded patients of diabetes mellitus and cardiovascular diseases in our study, other causes for the increased FBS leading to prediabetes, like the role of stress in daily life should be considered. Stress hormones are known to increase blood glucose levels. Physical and emotional stress increases these hormones thereby increasing blood glucose levels.

Increased blood glucose levels increase insulin levels in the body which in turn increase nor adrenalin. It is known to induce insulin resistance. Family history of diabetes should also be considered. Genetic cause for insulin resistance cannot be ruled out. As untreated prediabetes can progress to diabetes which can lead to microvascular complications effecting heart, kidney, retina, nerves etc., and can cause morbidity in the effected.

Measures should be taken by the prediabetics to keep the sugar levels normal from reaching diabetic levels by changing the lifestyle, increasing physical activity, consuming food having low glycemic index with high fiber content and frequent monitoring of blood glucose levels along with Hb A1c.

Prediabetic state is a ‘grey zone’ which implies a declining glucose homeostatic efficiency. Though only 25% of cases progress to full blown T2DM, when combined with obesity (BMI >25), it is a definite predictor of onset of T2DM in due course. Moreover, complications particularly cardiovascular abnormalities begin in prediabetic phase surreptitiously even before overt Diabetes is medically diagnosed. So as altered glycemic control points to insulin resistance in early diabetes and obesity, identifying this phase by simple tests like estimation of FBS, HbA1c goes a long way in preventing the onslaught of T2DM. Hence our study was an attempt at correlating body weight with FBS levels to prevent this metabolic syndrome with lifestyle modifications before it does major systemic damage

CONCLUSION

The existence of a significant direct correlation between FBS

and BMI was confirmed in the present study. Our results therefore suggest that a low BMI is important for maintaining normal blood glucose levels.

This study highlights the critical importance of early intervention directed at treatment of obesity in association with normal blood glucose levels to avert the long-term consequences of obesity and diabetes mellitus on the development of various complications.

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Correction of Acute Sagittal Plane Angular Deformity of Bilateral Tibia in a Case of Osteogenesis Imperfecta using Limb Reconstruction System

Narendra Singh Kushwaha¹, Shailendra Singh¹, Deepak Kumar¹, Vineet Sharma²

ABSTRACT

Introduction: Osteogenesis imperfecta is a genetic connective tissue disorder characterized by formation of brittle bones prone to develop fractures and deformities of limbs. Correction of deformity and bone union remains a challenge in such cases.

Case report: Herein we present a case of severe congenital angular deformity of bilateral tibia in anteroposterior plane in a 7 year old girl suffering from osteogenesis imperfecta. She was not able to stand and walk since birth. We treated her successfully by single stage procedure of corrective osteotomy and its fixation with limb reconstruction system (LRS) bilaterally.

Conclusion: External fixation using LRS greatly reduces frequency of fractures and facilitates bone healing effectively in cases of osteogenesis imperfecta. LRS is an excellent tool for correction of deformities in case of osteogenesis imperfecta.

Keywords: Osteogenesis imperfecta, Deformity, Limb reconstruction system

INTRODUCTION

Osteogenesis imperfecta is a group of hereditary connective tissue disorders that mainly affects bones. Term “osteogenesis imperfecta” means the genesis of bones is imperfect leading to formation of fragile bones. Mutations in the *COL1A1* and *COL1A2* genes that encode type I procollagen.¹⁻³ It is inherited in autosomal dominant fashion and its overall incidence of OI is approximately 1 case for every 20,000 live births. Abnormal synthesis of type I collagen leads to the qualitative defects in bones, teeth, ligaments, sclera and skin. Patients of osteogenesis imperfecta usually presents with history of repeated fractures without significant trauma along with similar kind of family history. There may be considerable differences in severity of expression of various fractures in different patients of the family. We present a case of osteogenesis imperfecta with severe angular deformity in both legs since birth keeping patient bed ridden. We treated this patient successfully by using limb reconstruction system

CASE REPORT

We report a case of 7 years old girl presented to our

department with complain of severe angular deformity of both legs since birth. Patient was never able to stand and walk through out her life. She also had history of repeated fractures in arm and both forearms treated with subsequent plasters. Dentition of the patient was imperfect along with blue sclera. Patient elder brother also had history of repeated fractures in leg and forearms. Patient was having angular deformity in tibia and fibula in coronal plane measuring about 80 degree on right side and 105 degree on left side [Figure 1]. There was no abnormality in central nervous system, cardiovascular system, gastrointestinal tract and respiratory system. Biochemical blood tests were normal except high level of serum alkaline phosphatase. Radiographic analysis of bones revealed healed fractures in both humerus, wrist and anteroposterior angular deformity in mid shaft of tibia fibula, thinning of the long bones and osteopenia [Figure 2]. Diagnosis of osteogenesis imperfecta was made on the basis of clinical and radiological findings. Bisphosphonate therapy was started and planned for surgical correction of deformities in leg in single stage.

Under general anaesthesia, diaphysis of tibia and fibula was exposed by single anterolateral incision at the site of maximum angulation. Anterior wedge based osteotomy was performed in tibia at site of angulation along with removal of a segment of fibula at same site. Deformity was corrected slowly on operating table and tibia was stabilised using limb reconstruction system external fixator (LRS). Post operative x ray showed acceptable restoration of longitudinal tibial axis in both limbs [Figure 3]. Clinically patient had almost normal looking well aligned legs at the end of 6 months [Figure 4]. At 6 months follow up x ray of leg showed well united osteotomy site and straight tibia bilaterally. LRS was removed at the end of 6 months and patient was followed for

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Figure-1: Preoperative clinical picture of both legs showing acute coronal plane angular deformity in right and left leg

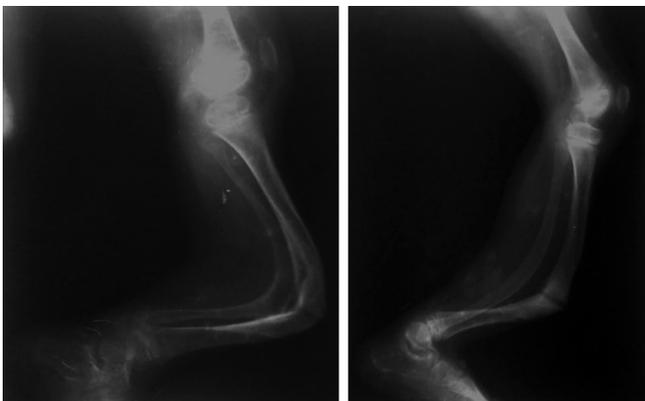


Figure-2: Preoperative X ray of right and left leg-lateral view showing angular deformity in coronal plane.

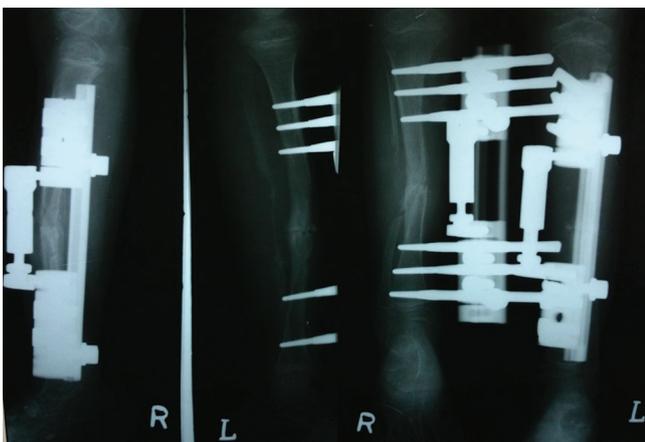


Figure-3: Post operative X ray of both laegs-AP & Lateral views.

2 years. Patient became able to walk without support there was no recurrence of the deformity.

DISCUSSION

Clinical forms of osteogenesis imperfecta (OI) vary from mild (OI type I) or moderate (OI type V-VII) to severe features (OI types III and IV), or even lethal in perinatal period (type II). Clinical presentation includes multiple fractures in the ab-



Figure-4: Clinical image of patient at 1 year follow up

sence of significant trauma, multiple bone deformities, blue sclerae, dentinogenesis imperfecta, and conductive or mixed deafness in childhood.^{1,4} Quantitative and qualitative defect in type I collagen is attributed to various genetic mutations including *COL1A1* and *COL1A2* genes.⁵⁻⁸ Most striking clinical feature is tendency to develop fractures in long bone following minor trauma and usually without significant pain and swelling.^{6,7} At most instances the clinical presentation and radiographic findings are sufficient for confirmatory diagnosis. However, other diseases responsible for frequent fractures should be excluded. In patients suffering from OI fractures may be discovered during infancy in tends to recur later in childhood but incidence of fractures decreases significantly after adolescence. Although abundant callus formation occurs during healing stage, the quality of this new bone also remains abnormal. This newly formed abnormal bone is more soft and leads to frequent malunion which ultimately results in deformities of long bones. Correction of deformities remains a challenge to orthopaedic surgeons. Loss of reduction, implant failure are frequently noted. Deformity correction in such cases may be achieved by intramedullary nails, ilizarov ring fixator or uniplaner limb reconstruction system. Ilizarov has poor patient compliance as compare to LRS and less technically demanding.

CONCLUSION

Osteogenesis imperfecta is a genetic bone disorder leading to genesis of qualitative and quantitative defective type I collagen. Recurrent fractures and abnormal nature of callus leads to formation of deformities of long bones. Correction of deformities by osteotomy and limb reconstruction system is an excellent modality of treatment.

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A Study on Nodal Positivity in Central Compartment of Neck in Differentiated Thyroid Malignancies: A Study From Tertiary Care Center

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ABSTRACT

Introduction: Thyroid malignancies are the difficult one to treat. The present study was designed to study the incidence of occult nodal metastases, total nodal yield and percentage of nodal positivity in central compartment in clinically node negative patients. 2. Association between primary tumor and nodal positivity.

Materials and methods: We recruited 50 patients with Differentiated Thyroid Cancers with clinically and radiologically negative nodes admitted to surgical wards in The Department of General Surgery and Surgical Oncology, during the study period from August 2013 to February 2015. CND and DTC protocol necessary for thyroidectomy were followed. Total thyroidectomy plus CND was performed in all cases by the same surgeon. Node clearance was performed in the anatomic space bounded by the hyoid bone cephalad and the suprasternal notch caudad and from the carotid sheath on one side to that on the other side laterally. Data of Nodes obtained at operation; Number of metastatic nodes found during operation was recorded. The samples were sent to the same pathologist for histopathological report. CND results were reported as per protocol: (1) Histopathological diagnosis (2) Size of primary tumor (3) Total nodal yield (4) Number of positive nodes (5) Extra thyroid extension. The MACIS score was calculated for all cases, and patients were assigned to the low-risk (<6 points) or high-risk (>6 points) MACIS groups. 50 patients were studied.

Results: Mean age was 43.70 ± 13.461 , minimum age 21 and maximum age 68. All nodal positive cases were papillary type; none of the follicular carcinomas had central lymph node metastasis. 6 cases with tumor size >2 cm had positive central compartment nodes and 1 patient with tumor size <2 cm had positive central compartment nodes. No patient had MACIS SCORE > 6, which infers that all cases were low risk group.

Conclusion: Mean age was 43.70 ± 13.461 . Papillary carcinoma is the most common type of DTC. Females have a preponderance over males (Female:Male = 2.8: 1). Tumour size >2 cm was independent risk factor for Central lymph node metastasis. Tumour size was frequently more in males.

Keywords: DTC, Differentiated Thyroid Cancer, Central Neck Dissection, MACIS, Papillary carcinoma

to the removal of all lymphatic and fibrofatty tissue located within the central compartment (level VI of the neck).

Preoperative ultrasonography (US)¹ of the central and lateral neck lymph node compartments should be performed in all patients who undergo thyroidectomy for differentiated thyroid cancer (DTC). No evidence of metastatic lymphadenopathy in patients on physical examination/preoperative imaging (No US normal will be either prophylactic/elective are controversial. By contrast when metastatic lymph nodes (NI) are apparent on preoperative staging exam and /or US, a therapeutic CLND² should be performed. Risks associated with CLND include injury to the recurrent laryngeal nerve and parathyroid glands, resulting in transient hypocalcemia or permanent parahypoparathyroidism. Recent studies have suggested that high volume of thyroid surgeons have lower rates of surgical complications. Objectives of the study were to study the incidence of occult nodal metastases, total nodal yield and percentage of nodal positivity in central compartment in clinically node negative patients and to find the association between primary tumour and nodal positivity.

MATERIAL AND METHODS

The study was conducted in Yashoda Hospital, Secunderabad, Telangana State. The study was conducted on Patients diagnosed with differentiated thyroid cancer with clinically and sonographically node negative status. 50 patients who satisfy inclusion and exclusion criteria were taken in study.

The study design was a prospective observational study. The data collected by interview technique with DTC after thorough clinical examination, investigations, treatment and follow-up details. 50 patients with Differentiated Thyroid

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INTRODUCTION

Central compartment lymph node dissection (CLND) refers

Cancers admitted in surgical wards are included in our study by applying the following inclusion and exclusion criteria, during the study period from August 2013 to February 2015.

Inclusion Criteria

1. Patients with histopathologically proven differentiated thyroid cancer.
2. Patients with clinically and sonographically node negative status.

Exclusion Criteria

1. Patients with benign thyroid swelling.
2. Patients with other than differentiated thyroid cancers.
3. Patients with preoperative clinical and sonographic node positive status.

Information on patients with DTC undergoing central compartment dissection was disseminated in health education sessions to complement the findings of study. The data were entered into MS-Excel spread sheets, and analysis was carried out. The procedures involved were transcription, preliminary data inspection, content analysis, and interpretation. Percentages were used in this study to analyze epidemiological variables.

Protocols of patients undergoing total thyroidectomy and central nodal dissection (CND)⁶ for differentiated thyroid cancers (DTC) were reviewed. Total thyroidectomy plus CND was performed in all cases by the same surgeon. Node clearance was performed in the anatomic space bounded by the hyoid bone cephalad and the suprasternal notch caudad and from the carotid sheath on one side to that on the other side laterally.

The following data were recorded: nodes obtained at operation; number of metastatic nodes and parathyroid glands incidentally resected; metastases, age, completeness of resection, invasiveness, size In all cases, the pathology study was performed by the same pathologist. CND results were reported as per protocol: (1) Histopathological diagnosis (2) Size of primary tumor (3) Total nodal yield (4) Number of positive nodes (5) Extra thyroid extension. The MACIS score was calculated for all cases, and patients were assigned to the low-risk (<6 points) or high-risk (>6 points) MACIS groups.

Data were analyzed with the use of the Statistical Package Stat view 14.2 (SAS Institute Inc., Cary, NC). Quantitative

	N	%
Mean age	43.70 ± 13.461	
Age <45/>=45	27/23	54/46
Gender (M/F)	13/37	26/74
Papillary/Follicular	48/2	96/4
Tumor Size (<2/>=2 cm)	38/12	76/24
Extra Thyroid Extension	5	10
Mean Nodal Yield	5.68 ± 2.195	
% Nodal Positivity	7	14
MACIS SCORE (<6/>=6)	50/0	100/0

Table-1: Variables in relation to Thyroid cancer

variables are expressed as mean ± SD and qualitative variables as proportions and percentages. Student t test was applied for various parameters. Contingency tables (chi-square) were used to investigate differences between qualitative variables. Significance was set at P < 0.05.

RESULTS

Patients with age < 45 were 27 and patients with age >= 45 were 23.37 were females and 13 were males. 48 (96%) reported to be papillary and 2 (4%) reported as follicular thyroid cancer. 4 patients were with tumor size >2 cm and 1 patient had a tumor size <2cm. Mean nodal yield was 5.68 ± 2.195, minimum 2 nodes to maximum 10 nodes were removed. 7 (14%) patients had positive nodes in central compartment of whom 6 were males and 1 was female.

Table 1 shows incidence of tumour in relation to age and sex, size of the tumour, extra thyroid extension and nodal positivity. MACIS score was done based on score.

DISCUSSION

50 patients were studied. Mean age was 43.70 ± 13.461. Minimum age 21 and maximum age 68. Patients with age < 45 years were 27 and patients with age >= 45 years were 23.37 were females and 13 were males. 48 (96%) reported to be papillary^{3,4,5} and 2 (4%) reported as follicular thyroid cancer.^{6,7} 38 patients had tumor size of <2cm (76%) and 12 patients had tumor size of > 2 cm (24%). Minimum dia. 0.3 cm and maximum diameter 4.3 cm with peak between 0.75 to 1.25 cm. 5

Variable	+ve Nodes Absent	Std. Dev.	Std. Err.	+ve Nodes Present	Std. Dev.	Std. Err.	T Test	Probability	Mann Whitney	Probability
Age	42.907	13.592	2.073	48.571	12.421	4.695	1.033	0.307	115.00	0.163
Sex	1.814	0.394	0.060	1.286	0.488	0.184	3.187	0.003	110.00	0.131
Tumor size >2 cm	0.140	0.351	0.053	0.857	0.378	0.143	4.972	0.000	6.00	0.000
Max Dia. cm	1.295	0.767	0.117	3.514	0.803	0.303	7.057	0.000	10.00	0.000
Extra Thyroid Extension	0.023	0.152	0.023	0.571	0.535	0.202	5.680	0.000	4.000	0.000

Table -2 Comparison between Central Compartment Metastasis and other variables

(10%) patients had extra thyroid extension of whom 4 were males and 1 was female, 4 patients were with tumor size >2 cm and 1 patient had a tumor size <2cm. Mean nodal yield was 5.68 ± 2.195 , minimum 2 nodes to maximum 10 nodes were removed. 7 (14%) patients had positive nodes in central compartment of whom 6 were males and 1 was female. All nodal positive cases were papillary type, none of the follicular carcinomas had central lymph node metastasis, which is consistent with the findings that regional lymph nodes involved more frequently with papillary carcinoma than follicular carcinoma, later has more of hematogenous spread to distant regions. 6 cases with tumor size >2 cm had positive central compartment nodes and 1 patient with tumor size <2 cm had positive central compartment nodes. No patient had MACIS SCORE > 6, which infers that all cases were low risk group.

Mean age of patients without CLNM was 42.90 ± 13.59 and with CLNM was 48.57 ± 12.42 ($p=0.30$), which is statistically insignificant. 5 males out of 13 and 2 females out of 37 had CLNM ($p=0.0025$), this implies statistically very significant. The findings of this study were similar to other studies done in the past.⁸⁻¹³

CONCLUSIONS

Mean age was 43.70 ± 13.461 . Papillary carcinoma is the most common type of DTC. Females have a preponderance over males (Female: Male = 2.8: 1). Papillary carcinoma is the most common DTC to have Central lymph node metastasis. Tumor size >2 cm was independent risk factor for Central lymph node metastasis. Tumor size was frequently more in males. Extra Thyroid Extension is more common in males. Mean nodal yield was 5.68 ± 2.195 . Central lymph node metastasis is more common in males in clinically N0 neck. Males are associated with greater morbidity owing to the extensive nature of disease in them. The risk factors for CLNM were male gender, tumor size >2 cm and capsular invasion (Extra Thyroid Extension). Routine prophylactic CND procedure for all DTC with N0 status is invalid.

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A Study of Prognostic Value of HbA1C in Non-Diabetic Patients of Acute Coronary Syndrome

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ABSTRACT

Introduction: Patients with diabetes mellitus have a poorer outcome after acute coronary syndrome (ACS) than the general population. Objective of the study was to assess the prognostic value of HbA1C in non-diabetic patients of acute coronary syndrome

Material and Methods: This observational cross sectional study included 110 patients without diabetes mellitus who were admitted to the ICU with symptoms suggestive of ACS. The diagnosis of ACS was made on the basis of troponin T value, ECG and echocardiograph. Patients were stratified according to their HbA1c into two groups: Group 1 HbA1c <5.6 (36, 36%), group 2 HbA1c between 5.7 and 6.4 (64,64%). Main outcome measures were ECG changes, trop T value, RWMA and left ventricular ejection fraction (LVEF) on echo, along with the complications like heart failure and arrhythmias. Data was analyzed separately using multiple regression analysis

Results: The mean age of patients was 58.67 years out of which 69% were males and 31% females. Of total, 28% were smokers, 33% were known to be hypertensive, 32% had dyslipidemia and BMI was ≥ 25 kg/ m² in 9% of the subjects. 91 cases out of 110 were positive for presence of RWMA on ECHO. In this, 70 patients had high normal HbA1C and 40 patients had normal HbA1C. Even the percentage of heart failure in high normal HbA1c level patients, was 64.75% as compared to 34.25% in normal HbA1c level patients.

Conclusion: HbA1C seems to be predictor of adverse results in acute coronary syndrome in patients without diabetes. Assessment of HbA1c levels may improve risk assessment in such patients when presenting with ACS.

Keywords: acute coronary syndrome, glycosylated haemoglobin, non-diabetics

ed HbA1c levels are associated with an increased mortality following AMI in diabetic patients.⁴ Additionally, stress hyperglycemia even in non-diabetics, is associated with many abnormalities like increased activation of stress responsive kinases⁵ and induction of apoptosis and myocyte necrosis, which in turn leads to systolic and diastolic dysfunction.⁶ Moreover HbA1c is an easy marker of long-term glucose regulation; it also unmasks minor glycometabolic disease, such as impaired glucose tolerance, impaired fasting glucose or metabolic syndrome.⁷ So this study was to examine whether there is an association exists between elevated HbA1c and all-cause mortality in patients hospitalized with ACS.

MATERIAL AND METHODS

This is a cross-sectional study conducted at Santhiram Medical College and General Hospital, Nandyal, AP during the period (Jan.2013– Dec. 2014). 110 patients who were admitted to the ICU with ACS were enrolled for this study. Mean age was 59.47 years. Patients' data of age, sex, body mass index, history of diabetes mellitus, hypertension, smoking and hyperlipidemia was obtained. Serum levels of the following parameters were tabulated: Glycosylated haemoglobin (HbA1c), fasting total serum cholesterol, low density lipoprotein (LDL), cholesterol and high density lipoprotein (HDL). Patients were excluded if they had history of Fasting blood sugar ≥ 126 (7 mmol/L), Postprandial blood sugar ≥ 200 (11.1 mmol/L) after a 75g oral glucose, HbA1c level >6 , CKD on maintenance dialysis and uremia, CLD, Sepsis, Hypothyroidism, those who donated blood recently or Acute & chronic blood loss, Gestational DM, Excessive alcohol intake, Haemoglobinopathy (Sickle cell anemia, Thalassemia,

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INTRODUCTION

Cardiovascular mortality is also increased in subjects with impaired glucose tolerance.^{1,2} Hyperglycaemia is common during AMI, and may be a result of stress-induced catecholamine release or previously unidentified diabetes mellitus. Glycated haemoglobin (HbA_{1c}) is a measure of glycaemia over the preceding months, and may be helpful in detecting abnormalities of glucose tolerance as there is an inverse relationship between HbA_{1c} and glucose tolerance.³ Elevat-

G-6 PD deficiency), Treatment of anemia with iron or erythropoietin, Autoimmune hemolytic anemia. Patients were stratified according to their HbA1c level into two groups; group 1: <5.6(n = 36) and group 2: 5.7-6.4 (n=64).

Left Ventricular Ejection Fraction was measured by Simpson's method using 2-dimensional echocardiography. BMI was measured as weight (kg)/ height (m²) and obesity was defined as BMI \geq 30kg/m².

STATISTICAL ANALYSIS

By using SPSS software version 15 all data of different variables were entered and analyzed with appropriate statistical tests.

Chi-square(X^2) was used for categorical variables, student's (*t*) test for continuous

variables and to compare means. Bivariate Pearson's correlation coefficient was calculated to evaluate the associations among different variables. Partial correlation regression and multivariate analysis were used to determine the association between HbA1C levels and Ejection fraction with control on other variables. Level of significance (p-value) was set at $P \leq 0.05$.

Variable	No of patients	Percents
Gender		
Male	69	61%
Female	41	31%
BMI		
<25	91	91%
>25	19	9%
Smoking		
Smoker	28	28%
Non smoker	82	78%
Hypertention		
Yes	38	33%
No	72	67%
HDL		
Normal	80	71%
Low	30	29%
LDL		
Normal	72	68%
High	38	32%
Cholesterol		
Normal	78	68%
High	32	32%

Table-1: Baseline characteristics of patients

Age Group	Male		Female		Total	
	Normal HbA1c	High Normal HbA1c	Normal HbA1c	High Normal HbA1c	Normal HbA1c	High Normal HbA1c
Below 40	9	1	1	1	5	2
41 to 60	11	20	3	17	15	41
Above 60	10	18	7	12	20	27
Total	30	39	11	30	40	70

Table-2: Patients in relation to age, sex and hba1c level

RESULTS

In this study 110 ACS patients were enrolled with mean age of 58.67 years. The number of male patients was 69 as compared to 31 females with a sex ratio of approx 2:1. Most of the patients were in the age group of 40 to 60 years (table 1). In our study 70 out of 110 patient were of high normal HbA1c, and 40 belonged to normal HbA1c. The mean value of HbA1c in patients with normal HbA1c was 5.3 ± 0.14 and in patients with high normal HbA1c were 6.10 ± 0.16 (table 2). There were 76.57%(49 out of 70 patients) cases of ST segment elevation MI in high normal HbA1c level patients as compared to 69.45%(25 out of 36 patients) in normal HbA1c level patients.

In all 110 patients, Trop T values were estimated. Patients with high normal HbA1c levels had mean Trop T value 2179.3 ± 252.1 as compared to patients with normal HbA1c level with mean Trop T value 1915.9 ± 244.7 with p value <0.0001 which is statistically significant, which means these two groups are significantly different. In our study, 91 cases out of 110 were positive for presence of RWMA on ECHO. Out of these, 64(66.66%) patients had high normal HbA1c and 27(33.33%) patients had normal HbA1c. In all 110 patients, LVEF was estimated by ECHO and mean LVEF was 42.64%. Patients with high normal HbA1c level had lower LVEF with mean EF of 38.22 ± 11.54 as compared to patients with normal HbA1c level with mean 47.64 ± 8.32 with p value <0.0001 .

Patients were assessed clinically for signs of heart failure and were then grouped according to their HbA1c levels. It was found that the percentage of heart failure in high normal HbA1c level patients were 68.75% (11 out of 16 patients) as compared to 31.25%(5 out of 16 patients) in normal HbA1c level patients. Electrocardiogram was obtained in all the patients included in this study and the patients were divided on basis of arrhythmia on presentation. The percentage of arrhythmia in high normal HbA1c level patients was 69.23% (9 out of 13 patients) as compared to 30.77% (5 out of 13 patients) in normal HbA1c level.

DISCUSSION

The objective of this study is to access the prognostic value of HbA1c in non diabetic patients presenting with Acute coronary syndrome. 100 patients (diagnosed as per clinical symptoms, ECG changes, Trop T values), who were above

30 years of age and gave consent, were enrolled in this study. Different metabolic parameters, ECG, Echo criteria were evaluated in them. The results were analyzed in terms of demographic profile (age and sex), metabolic parameters (blood sugar- both fasting and postprandial, HbA1c, lipid profile, Trop T, BMI), ECG and Echo criteria, severity (Trop T quantitative levels, EF, RWMA, ECG) and complications (LVF, arrhythmia). In the current study we found a relation between HbA1c and poor outcome among patients of ACS without known diabetes. Elevated HbA1c level was a strong and independent predictor of severity and complication in ACS patients even in non- diabetics. Selvin E, et al. and Khaw KT, et al. showed that an elevated HbA1c is associated with increased cardiovascular risk in patients with and without diabetes.^{7,17} Malmberg *et al.* found an association between elevated HbA1c and mortality after myocardial infarction, relative risk (95% CI) 1.07 (1.01-1.21)⁹; however, Timmer *et al.* and Cao *et al.* did not confirm this, [1.63 (0.99-2.79) and 1.08 (0.31-3.23)], respectively.^{10,11} Increasing HbA1c levels were clearly associated with adverse baseline characteristics such as a higher cardiovascular risk profile, explaining in part the poorer outcome of ACS. In a systematic review of 15 studies (1966–1998) on AMI, the association of hyperglycaemia with increased in-hospital mortality was stronger in non-diabetic patients than in diabetic patients.¹² In a study conducted in Asian Indians with normal glucose tolerance (NGT), a strong correlation of HbA1c and cardiovascular risk factors was found. NGT subjects with three or more metabolic abnormalities had the highest HbA1c levels and an HbA1c cut off point of $\geq 6.5\%$ was found to have the highest accuracy in predicting both metabolic syndrome and coronary artery disease.¹³ Elevated glucose is not only a feature of glucose dysregulation, but also of stress and a more high-risk patient population. Stress hyperglycemia is a common occurrence in patients admitted to the intensive care units with acute coronary syndrome. Hence, elevated HbA1c levels can be predictive for cardiovascular disease and mortality in patients without diabetes mellitus, regardless of fasting glucose levels, a finding that was suggested in a recent cohort study.¹⁴ In addition to the effect of associated insulin resistance, excess glucose may be directly detrimental during ACS, offering a target for treatment. The molecular mechanisms for this adverse effect include the promotion of oxidative stress, non-enzymatic glycation of platelet glycoproteins with abrupt changes in aggregability, amplification of inflammation, and suppression of immunity.¹⁵ In fact, some studies have shown even higher cardiovascular mortality and morbidity in patients with hyperglycemia in previously undiagnosed diabetes than in patients with known diabetes or normoglycemic subjects.¹⁶ It has been shown that higher HbA1c is associated with a larger infarct size, a lower ventricular function and a higher Killip class.¹⁵ In addition, part of the association between longterm abnormalities in glucose control and outcome is due to the same complex mechanisms responsible for the adverse association between

overt diabetes mellitus and cardiovascular outcome.

In our study 76 out of 100 patients had ST segment elevation on ECG. Among these 76 patients, who had ST segment elevation on ECG, 49 patients belonged to high normal HbA1c group and 27 patients to normal HbA1c group. 24 patients showed no ST segment elevation on ECG, of these patients, 15 were in high normal HbA1c group and 9 were in normal HbA1c group. Hence, we found that the ST segment elevated ACS is more common in high normal HbA1c group as compared to normal HbA1c group.

Also, we found that most of the patients with high normal HbA1c have higher Trop T values as compared to most of the patients with normal HbA1c.

In our study RWMA was assessed by echocardiography, which showed 81 patients out of 100 having RWMA. Among these 81 patients, 54(66.66%) belonged to high normal HbA1c group and 27 (33.33%) patients were in normal HbA1c group. 19 patients out of 100 had no RWMA, of these 10(52.63%) belonged to high normal HbA1c group and 9 (47.36%) to normal HbA1c group. Thus, RWMA on echocardiography was more common in high normal HbA1c group (66.66%) as compared to normal HbA1c group (33.33%).

In our study, we found that most of the patients having high normal HbA1c had lower LVEF (mean 38.22% \pm 11.54) as compared to most of the patients with normal HbA1c, who had higher LVEF (47.64% \pm 8.32). Heart failure was seen in 16 patients out of 100. 11(68.75%) patients of heart failure were in high normal HbA1c group and 5(31.25%) were in normal HbA1c group. Arrhythmia was present in 13 patients out of 100. 9(69.23%) patients of Arrhythmia were in high normal HbA1c group and 4(30.76%) were in normal HbA1c group

CONCLUSION

This study shows that ACS patients without diabetes mellitus are associated with poorer outcomes if they have higher levels of HbA1c. High normal HbA1c is associated with more complications like LVF and arrhythmia. High normal HbA1c is also associated with more severe ACS in terms of higher levels of Trop T, lower EF, presence of RWMA on ECHO, Presence of ST elevation on ECG as compared to normal HbA1c patients.

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Conventional and Modified Papilla Preservation Flap (PPF) using Bone Graft and Platelet Rich Fibrin (PRF): an Attempt of Management of Soft Tissues in an Esthetic Zone

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ABSTRACT

Introduction: Esthetics is of prime concern in today's sophisticated and modernised society. Esthetics is the science of beauty and encompasses almost every field of dentistry. An ideal periodontal therapy must necessarily consider esthetic appearance, which means an effort to maintain gingival marginal anatomy and as much height of papilla as possible along the course of the periodontal therapy. Often, non-surgical approach is encouraged for maxillary anterior dentition. However, there are situations in which surgical therapy is unavoidable.

Case Report: This case report describes Conventional as well as Modified Papilla Preservation Flap Techniques along with bone graft and a second generation Platelet concentrate PRF to treat anterior maxillary dentition with periodontal bone defect.

Conclusion: Papilla preservation flap technique not only results in an esthetically pleasing architecture but also provides a better approach for interproximal regenerative procedures.

Keywords: Conventional Papilla Preservation, Modified Papilla Preservation, Platelet Rich Fibrin, Bone graft.

PPF ensured optimal interdental coverage, facilitated easier placement as well as retention of the bone grafts and prevented displacement of the graft material.³ The pre-requisite for preserving the interdental tissue is the presence of wider embrasures between the teeth and the absence of tight contacts.³

Conventional Papilla Preservation Flap (PPF)

Facially, sulcular incisions are given around each tooth without involving the interdental papilla. Palatally/lingually sulcular incisions are given continuous with a semi-lunar incision across the interdental papilla. From the line angles, papillary incision line is greater than 5mm from the gingival margin. During surgery the gingiva especially in the interdental region should be firm and free of inflammation.

Modified Papilla Preservation Flap (MPPF)

In the year 1988, Checchi et al. modified the conventional technique. The technique reportedly states that it is better to use a horizontal incision than a semilunar incision in the interproximal region, given in the opposite side of the bone defect as it facilitates the preservation of the regenerated area from the oral environment.⁴ The term Modified Papilla Preservation Flap was given by Cortellini et al. in 1995.⁵

INTRODUCTION

Periodontics is that speciality of dentistry which encompasses the prevention, diagnosis and treatment of diseases of the supporting and surrounding tissues of the teeth or their substitutes and the maintenance of the health, function and esthetics of these structures and tissues.¹

“Esthetics” is the science of beauty, which is the particular detail of an animate or inanimate object that makes it appealing to the eye. Esthetic or cosmetic dentistry strives to merge function and beauty with the values and individual needs of every patient. A common finding after performing definitive pocket elimination therapy, especially in the maxillary anterior region, is the unesthetic appearance of gingiva due to a greater crown and root exposure marked by an increased spacing in the interdental region giving it a picket fence appearance.²

To avoid the occurrence of unesthetic maxillary anterior gingival architecture, our focus should be on preserving the interdental papillae thus making it esthetically pleasing.

The surgical approach of preserving the interdental papilla was introduced by Takei et al. in 1985 who named the technique as Papilla Preservation Flap Technique (PPF).

CASE REPORT

A 35-year old male patient reported to the Department of

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Periodontics with the chief complaint of bleeding gums since two years. Intraoral examination revealed periodontal pockets in relation to maxillary teeth with pocket probing depth of more than 9mm which bled upon probing.

The maxillary anterior teeth exhibited Grade I Miller's recession, interdental spacing between teeth #11, #21, #22 & #23. Keratinized tissue at the site of interest was adequate. The radiographs revealed vertical bone defect in relation with maxillary anterior teeth.

Based on the clinical and radiographic data, patient was diagnosed to have chronic periodontitis.

Subsequent scaling and root planing was achieved and patient was motivated for oral hygiene care. The areas were re-assessed for gingival health, pocket probing depths and gingival bleeding during supportive periodontal care, which indicated a need for surgical intervention with predictable esthetic value.

Conventional PPF was planned with teeth #11 & #21 and modified with #21 & 22, #22 & #23. The patient gave his consent to the treatment protocol after the form of therapy was explained to him.

Adequate anesthesia using 2% lignocaine with a concentration of 1:100,000 epinephrine was obtained. The extent of bone defect was probed as the extension of the osseous defect in relation to the palatal aspect of the interdental papilla determines the position of semilunar incision. The facial surface was prepared with a sulcular incision around teeth #11 and #21 with no incisions made through the interdental papilla.

The palatal flap design consisted of sulcular incisions along the palatal aspect of the teeth in relation to the central incisors with a semilunar incision made across the interdental papilla in relation to the teeth 11 and 21. This semilunar incision was made such that it dipped apically from the line angles of the tooth so that the papillary incision line was at least 5 mm from the gingival margin which allowed the interdental tissue to be dissected from the palatal aspect facilitating intact elevation with the facial flap.

Papilla incorporated in facial flap

After the incisions, flaps were reflected and the interdental papilla was then freed from the underlying hard tissue using interproximal knife. This detached papilla was then pushed through the interdental space with a periosteal elevator in a way that the entire papilla would be incorporated in the flap. The reflected flap was scraped on the inner side and trimmed off to eliminate pocket epithelium. Thorough debridement was done with the help of curettes followed by meticulous scaling and root planing.

Preparation of PRF

5 ml of venous blood was drawn in a test tube without an anticoagulant, and centrifuged immediately. It was centrifuged for 10 minutes at 3000 rpm.



Figure-1: Preoperative view



Figure-2: Papilla incorporated in facial flap



Figure-3: PRF plug



Figure-4: PRF with bone graft



Figure-5: Post operative view at 1 month

PRF with bone graft

The flaps raised by conventional method were sutured by interrupted sutures and the facial flap containing the papilla was brought to contact well with the incision line on the palatal aspect and a direct suture was placed.

A surgical dressing was placed as it reduces the chances of flap displacement by mastication, accidental tooth brushing or interferences by tongue action.

Patient was instructed to rinse with 0.2% chlorhexidine twice a day for two weeks.

Periodontal dressing and sutures were removed one week postoperatively. The healing was uneventful. Patient was advised to initiate mechanical oral hygiene from the second post operative week. Supportive periodontal therapy was provided every month and oral hygiene instructions were reinforced at that time. The patient was followed up post operatively for one year duration.

DISCUSSION

The modern periodontal paradigm is directed towards the establishment of physiological form of gingiva thereby restoring its optimal function and esthetics. Conventional papilla preservation flap method preserves the interdental papilla by incorporating the entire papilla in one of the flaps and also guarantees a result very similar to a situation preceding surgery.

The present case utilized papilla preservation flap method in the anterior maxillary teeth 11 and 21 to obtain reduction of the periodontal pockets with an esthetically pleasing result. During the course of supportive periodontal care, the gingiva exhibited health with normal pyramidal shaped interdental papilla and no gingival bleeding was observed.

Modifications in the conventional papilla preservation flap technique can be appropriately used with coronally displaced flap along with bone graft and barrier membrane.⁶ Modified papilla preservation flap is indicated in teeth having narrow interdental spaces.⁷ These flap methods require expertise as they are technique sensitive which makes them time consuming and are indicated wherein regenerative therapy is anticipated.

In the present case, Platelet Rich Fibrin (PRF) plug minced together with bone graft (HA+TCPA) was used in relation to 11. PRF is a second generation Platelet concentrate developed by Dr. Joseph Choukroun in France in the year 2001.⁸ PRF has additional advantage over the first generation Platelet Rich Plasma (PRP) as it is strictly autologous since it does not require addition of an anticoagulant or bovine thrombin thus does not induce antigenicity. It has been used extensively in combination with bone graft materials for periodontal regeneration, ridge augmentation, sinus lift procedures for implant placement and for coverage of recession defects in the form of a membrane.

CONCLUSION

Although a non-surgical approach is advocated for maxillary anterior region but there are conditions when surgical approach cannot be avoided. A surgical approach that splits the papilla certainly contributes to shrinkage and decrease in the height of interdental papilla leading to exposure of the interproximal embrasures.

In such cases, Papilla Preservation Technique provides a better approach for optimal interproximal regeneration in an esthetically pleasing manner.

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Effect of Honey in Radiation Induced Mucositis in Head and Neck Cancer

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ABSTRACT

Introduction: Mucositis is a common side effect of chemo radiotherapy to the head and neck region. It compromises patient's health and quality of life. Standard treatment is not available at present. Care is limited to symptom control. Honey has anti-bacterial and anti-inflammatory properties. It is naturally available, cheap, and ubiquitous. Hence to know the effect of honey in radiation induced mucositis.

Materials & methods: 56 cancer patients receiving concurrent chemoradiotherapy to head and neck region were recruited in this study from October 2012 to August 2014. Study group consisted 27 patients and control group consisted 29 patients. Study group patients received topical application of honey collected from CAROM plant along with chemo radiotherapy and control group patients received only chemo radiotherapy. All patients were assessed twice a week for the onset and severity of mucositis. Both study and control group patients were advised to take plenty of oral fluids, supplementation with high protein diet and oral dental care.

Results: 15 (55.6%) patients in study group developed mucositis at 13th fraction whereas 15(51.7%) patients in control group developed mucositis at 10th fraction indicating that honey postpones the onset of radiation induced mucositis. The severity of radiation induced mucositis at every assessment showed statistically significant difference between study group and control group. This clearly showed control group patients were with higher grades of mucositis than study group patients.

Conclusion: This prospective interventional study found the usefulness of topical application of honey in reducing the onset and severity of radiation induced mucositis in patients receiving chemo radiation to head and neck cancers.

Keywords: Honey, Radiotherapy, mucositis, Head and neck cancers.

juvant treatment later stage head and neck cancers. Due to the radiation-induced DNA damage of surrounding critical structures, radiotherapy can cause debilitating side effects such as skin reactions (erythema, dry desquamation, moist desquamation), oral mucositis (mouth ulceration) xerostomia (dry mouth).

Oral mucositis is caused by a multi-step biological process, which occurs in 30 to 40% of patients receiving chemotherapy, 60% of patients receiving radiation therapy and 92% of patients receiving both chemotherapy and radiation therapy.^{1,2,3} It can cause serious secondary complications such as pain, difficulty in eating and swallowing, taste changes, infection, malnutrition and weight loss. It can also lead to a reduction in total dose delivered to the tumor bed and unscheduled treatment breaks. This can have a detrimental effect on local tumor control and thus patient survival.⁴

Management of mucositis is critical to maintain the patients food pathway, avoid interruption in the delivery of radiation treatment and to avoid hospitalization and the need for parenteral or tube feeding. Currently there is no standard treatment for oral mucositis in head and neck cancer patients worldwide. Food and Drug Administration (FDA) have no approved intervention for prevention of radiation induced mucositis.⁵ Current management of oral mucositis is limited to symptom control including pain relief and maintenance of good oral hygiene. One of the latest interventions for the management of radiation induced oral mucositis is natural honey.^{6,7,8,9} It has antimicrobial properties¹⁰ and promotes wound healing.

The main objective of this study is to know the effect of topical application of honey on onset and severity of radiation induced mucositis in head and neck cancer patients receiving radiation.

INTRODUCTION

The head and neck cancers form the seventh most common cancer worldwide. They are the most common cancers in developing countries, especially in Southeast Asia. Head and neck cancers are more common in males compared to females. This is mainly attributed to the use of tobacco, areca nut, alcohol etc.

Most of the head and neck cancer patients receive radiotherapy at some stage during treatment. Radiotherapy plays a significant role as a primary treatment in early stage and ad-

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MATERIALS AND METHODS

Present study was done in the department of radiotherapy in MNJ Institute of Oncology & Regional Cancer Centre. The patients were randomly selected from year 2012 to 2014 and were allotted study group and control group.

Inclusion Criteria

Histo-pathologically confirmed non-metastatic Squamous cell carcinoma of head and neck region, age less than 70 years, ECOG performance status of 0-2, Patients should receive Concurrent Chemo radiotherapy as primary treatment.

Exclusion criteria

Tumors of non-Squamous histology, age greater than 70 years, ECOG performance status of >2, any prior treatment received for the tumor, any co-morbid condition or acute infection where treatment is contraindicated, evidence of distant Metastasis.

Patients Recruitment

56 patients receiving concurrent chemo radiotherapy to head and neck cancers were recruited in this study during October 2012 to August 2014. 27 were taken in study group and remaining 29 were taken into control group. Study group received 10ml of natural honey (Carom Plant) procured from NIRD (National Institute of Rural Development) for topical application in oral cavity 10min before and after radiation treatment. They were asked to swirl honey in oral cavity and swallow it slowly so that it can be smeared on oral and pharyngeal mucosa before and after every radiation fraction. Control group patients received only chemo radiotherapy. Both study group and control group patients were advised to take plenty of oral fluids, supplementation with high protein diet and oro-dental care.

Radiation Treatment Planning and Delivery

All patients underwent pre RT oro-dental care. Radiotherapy was delivered by linear accelerator (LINAC) using 6MV X rays. Computer based CT planning was done for all patients in two phases with total dose of 66Gy/33#.

Phase I: 44Gy/22 fractions, 5 fractions per week

Phase II: 22 Gy/11 fraction, 5 fraction per week, sparing the spinal cord.

Patients in both arms received concurrent chemotherapy with cisplatin 40 mg/ m² given weekly with radiotherapy

Toxicity Assessment

All Patients were assessed twice a week (3# & 5# in 1wk, 8# & 10# in 2wk, 13# & 15# in 3wk, 18# & 20# in 4wk, 22# in 5wk, 25# & 28# in 6wk, 30# & 33# in 7wk) for tumor response and development of mucositis. Mucositis was examined clinically under good light. RTOG (Radiation Therapy Oncology Group) grading system was utilized to grade the mucositis.

RTOG Grading System

Grade 0 : No change

Grade 1 : Mucosal erythema

Grade 2 : Studded mucositis / Patchy mucositis

Grade 3 : Confluent mucositis not requiring intervention

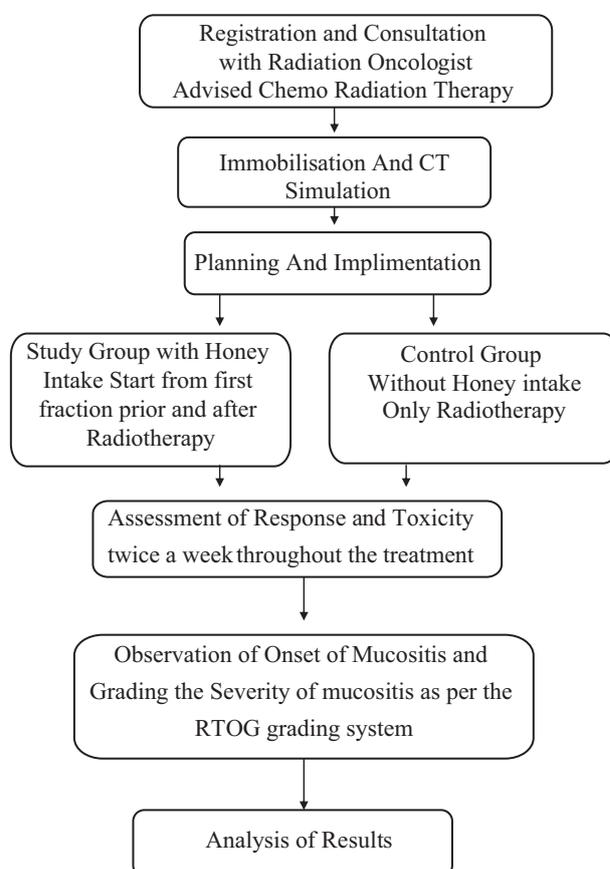
Grade 4 : Ulceration necessitates for treatment break.

Data Collection and Statistical Analysis

The collected data was analyzed using standard statistical software package (SPSS version 20.0). The onset and severity of mucositis were analyzed in both groups. The two groups were compared using chi square test to check whether they were balanced in terms of patient and disease related characters like stage, sex, tumor site, performance status, age, and histology.

RESULTS

Patients were selected according to inclusion and exclusion criteria. Total of 56 patients with Head and Neck cancers were enrolled. Study group consisted 27 patients and control group consisted 29 patients. Patients were in the age group of 25-58 years in study group whereas 30-62 in control group. The mean age of patients in study group was 40.6 The mean age of patients in control group was 48.03. The patients were assessed regularly twice a week for the onset of mucositis and severity of mucositis according to RTOG mucositis grading system.



Fraction	study	control	Total	Df	X ²
Eight	1(3.7%)	12(41.4%)	13(23.2%)	4	0.000
Ten	10(37%)	15(51.7%)	25(44.6%)		
Thirteen	15(55.6%)	2(6.9%)	17(30.4%)		
Fifteen	1(3.7%)	0(0%)	1(1.8%)		

Table-1: Onset of mucositis in study group and control group

Fractions	Grade	Study	Control	DF	X ²
3#	G0	27 (48.2%)	29 (51.8%)	NS	NS
w5#	G0	27 (48.2%)	29 (51.8%)	NS	NS
8#	G0	26 (96.3%)	17 (58.6%)	2	0.004
	G1	1(3.7%)	11(37.9%)		
	G2	0 (0%)	1(3.6%)		
10#	G0	16 (59.3%)	2 (6.9%)	3	0.000
	G1	8(29.6%)	13(44.8%)		
	G2	3(11.1%)	14(48.3%)		
13#	G0	1 (3.7%)	0(0%)	2	0.000
	G1	21(77.8%)	5(17.2%)		
	G2	5(18.5%)	24(82.8%)		
15#	G1	15(55.6%)	0(0%)	2	0.000
	G2	12(44.4%)	25(86.2%)		
	G3	0(0%)	0(0%)		
18#	G1	6(22.2%)	0(0%)	2	0.000
	G2	19(70.4%)	14(48.3%)		
	G3	2(7.4%)	15(51.7%)		
20#	G1	21(77.8%)	4(13.8%)	2	0.000
	G2	6(22.2%)	24(82.8%)		
	G3	0(0%)	1(3.4%)		
22#	G2	15(57.7%)	1(3.4%)	2	0.000
	G3	11(42.3%)	21(72.4%)		
	G4	0(0%)	7(24.1%)		
25#	G1	8(28%)	0(0%)	3	0.006
	G2	16(64%)	24(82.8%)		
	G3	1(4%)	3(10.3%)		
	Absconded	1(4%)	2(6.9%)		
28#	G1	12(50%)	1(3.7%)	3	0.001
	G2	12(50%)	23(85.2%)		
	G3	0(0%)	2(7.4%)		
30#	G0	3(12.5%)	0(0%)	3	0.002
	G1	13(54.2%)	4(15.4%)		
	G2	8(33.3%)	21(80.8%)		
	G3	0(0%)	1(3.8%)		
33#	G0	5(20.8%)	0(0%)	3	0.000
	G1	14(58.3%)	5(19.2%)		
	G2	5(20.8%)	20(76.9%)		
	G3	0(0%)	1(3.8%)		

Table-2: Assessment of mucositis at every fraction in study group and control group

Onset of Mucositis

The onset of mucositis in study group and control group was as follows:

1 (3.7%) patient in study group and 12(41.4%) patients in control group developed grade1 mucositis at 8th fraction. 10 (37%) patients in study group and 15(51.7%) patients in control group developed grade 1 mucositis at 10th fraction. 15 (55.6%) patients in study group and 2(6.9%) in control group developed mucositis at 13th fraction.

The mucositis was assessed twice a week. The following table shows the grades of mucositis on every assessment.

None of the patients in study group and control groups developed mucositis at 3#.

DISCUSSION

Radiation-induced mucositis is a normal accompaniment of radiotherapy to the head and neck area. Normally, the oral mucosa has a relatively high cell-turnover rate. Exposure to ionizing radiation leads to mucosal erythema, small whitish patches and ultimately results in confluent mucositis.¹¹ In later phases, oral ulceration and bleeding become a dose-lim-

Study Group		Control Group	
Fraction	Mean mucositis score	Fraction	Mean mucositis score
Eight	0	Eight	0.44
Ten	0.4	Ten	1.41
thirteen	1.1	thirteen	1.82
Fifteen	1.4	Fifteen	2.13
Eighteen	1.8	Eighteen	2.51
Twenty	2.2	Twenty	2.89
Twenty two	2.4	Twenty two	3.2
Twenty five	1.7	Twenty five	2.11
Twenty eight	1.3	Twenty eight	2.03
Thirty	1.1	Thirty	1.88
Thirty three	0.9	Thirty three	1.84

Table-3: Mean mucositis score for study group and control group

iting toxicity. Mucositis a result of imbalance between cell loss and cell proliferation. The intensity of mucositis can be altered by new fractionation schedules, concurrent chemo-radiotherapy and co-morbid medical conditions. Bacterial colonization in the oral mucosa can aggravate the pre-existing mucositis.¹² Endo toxins released from the gram-negative bacilli are potent mediators of the inflammatory process in the oral mucosa. Oropharyngeal flora, too, contributes to the radiation-induced mucositis.

The basis of management of radiation mucositis is targeted to its four defined

Pathogeneses¹³:

- To check basal cell layer growth by modifying transforming growth factor β 3.
- Stimulation of epithelization, thereby encouraging rapid recovery of cell loss.
- chemical protection of mucosa using the Amino-Thiol group of compounds like amifostine.
- Physical protection of oral mucosa by shield use, Conformal therapy or Intensity modulated radiotherapy.

There is no standard treatment for radiation induced mucositis. In this study, honey is used topically over mucosa prior to and after radiation treatment every day during the entire course of treatment starting from first fraction, to know the effectiveness on radiation induced mucositis. Honey is naturally available, cheap, and ubiquitous and exhibits antibacterial, analgesic and tissue nutritive factors to stimulate re epithelization in damaged mucosa.^{14,15,16,17,18}

Age and Sex of patients

According to (Dodd,1999), younger patients of age less than 20 years are more susceptible for oral mucositis due to more rapid epithelial mitotic rate or the presence of more epidermal growth factor receptors in the epithelium at the early age.^{19,20} On the other hand, the physiologic decline in renal function associated with aging may result in higher incidence of oral mucositis in older patients.¹⁹

Onset of Radiation Induced Mucositis

No patients developed RIM at 5th fraction assessment either in study group or control group. The onset of mucositis in control group patients at 8th (41.4%) & 10th (51.7%) constituted 93.1% of control group patients whereas the onset of mucositis at 10th (37%) & 13th (55.6%) in study group patients constituted 92.6% of patients of study group.

Biswal et al. (2003) conducted a clinical trial investigating the effect of tea plant honey on oral mucositis in patients receiving radiation therapy. In their study, 40 patients with oropharyngeal carcinoma were divided into two groups to receive radiation alone or radiation plus topical application of pure natural honey. They reported a significant reduction in the severity of oral mucositis in those patients treated with honey. Only 25% of patients in the honey group developed grade three or four mucositis compared to 75% in the control group.

Sadakshetram jayachandran et.al, 2012, conducted a study to evaluate the effect of natural honey and 0.15% benzydamine hydrochloride on the onset and severity of radiation induced mucositis. They assessed patients daily, for the onset and severity of mucositis. The onset of mucositis for honey group was on 14th day compared to 12th day for 0.15% benzydamine and control group.

The present study results also showed the onset of mucositis for majority of study group patients was at 13th fraction whereas for control group patients was at 10th fraction inferring honey postpones the onset of mucositis.

SEVERITY OF MUCOSITIS

The current study assessed mucositis twice a week till the end of radiation treatment. Thus patients were assessed at 3rd, 5th, 8th, 10th, 13th, 15th, 18th, 20th, 22nd, 25th, 28th, 30th and 33rd fractions.

Pattern of mucositis

All patients developed mucositis during radiation treatment. The severity of mucositis was increased as the fractions were increased and towards the end of the treatment severity was decreased in both groups.

The majority patients in study group developed mucositis around 10th & 13th fraction (92.6%) and majority of patients in control group developed around 8th & 10th fraction (93.4%). The severity of mucositis assessed at every fraction showed a statistically significant difference between study and control groups with p value of <0.01.

The results of this study were consistent with the following randomized controlled clinical trials investigating the effect of honey on oral mucositis, using a similar study protocol.

Motallebnejad et al. (2008) and Rashad et al. (2008) conducted similar trials using honey in Iran and Egypt respectively. Motallebnejad et al. (2008) evaluated 40 patients with 20 in each arm to receive and not to receive honey. Mucositis

was assessed with oral mucositis assessment scale(OMAS). The results showed significant reduction in mucositis among honey received patients compared with controls with p value of 0.000. Rashad et al. (2008) randomized 40 patients to study group to receive honey topically along with radiotherapy and control group only with radiotherapy. Patients were assessed weekly for the development of mucositis. No patients in the study group developed grade 4 mucositis and only 15% of patients developed grade 3 mucositis whereas 65% of patients developed grade 3/4 mucositis in control group ($p < 0.05$). Motallebnejad et al. (2008) used saline mouthwashes and Rashad et al. (2008) used Benzydamine HCl mouthwashes for all patients.

Sadaksharam jayachandran et al. evaluated 60 patients and divided them into 20 patients each group taking honey orally, 0.15% benzydamine chloride and normal saline during radiation treatment. They found pure natural honey delays the onset of radiation induced mucositis and significantly reduce the severity of mucositis. The differences between the groups were statistically significant ($P < 0.001$).

Important factors that influence the effectiveness of honey: Its hygroscopic nature, acidic pH prevents bacteria growth when applied to the mucosa, Inhibin (hydrogen peroxide) converted from glucose oxydase and gluconic acid, Enzymes (growth factors?) and tissue-nutritive minerals and vitamins help repair tissue directly.

The antibacterial property of honey depends upon its concentration. The effect on radiation mucositis in honey treated patients might be due to the bacteriostatic effect of viscid honey. Pure honey is acidic, with a pH of around 3.9. The solubility reducing factor present in honey can activate in absence of saliva. Honey applied on radiation induced xerotic mucosa increases the micro hardness of enamel, thereby preventing caries. Hence, it has been postulated that honey is less Cariogenic in dry mouth patients.

There are currently no approved agents or strategies that reliably prevent RIM, although several agents are under investigation. The current recommendations for mucositis are directed at limiting its extent and/or severity by appropriate treatment selection, attention to RT planning details, and the use of supportive and palliative care including basic oral care, aggressive use of analgesics, the use of feeding tubes in selected cases, and swallowing exercises and therapy. Honey has been found effective in burn wounds, oral infections and acceleration of surgical wound healing. Pure honey is ubiquitous, cheap and natural, and exhibits antibacterial, analgesic and tissue nutritive factors to stimulate re epithelization in the damaged mucosa, and is thereby a justified agent to try in radiation mucositis. Through this study, topical application of honey can be used as an effective intervention to prevent the radiation induced mucositis.

CONCLUSION

1. This small prospective interventional study found the

usefulness of topical application of honey in reducing the onset as well as severity of radiation induced mucositis in patients receiving radiation to head and neck cancers.

2. The results of the study are similar with three overseas studies Biswall et al., 2003; Motallebnejad et al., 2008 and Rashad et al., 2008 and one Indian study by Sadaksharam jayachandran and Narasimhan Balaji, 2010.

Limitations

1. The sample of patients is small.
2. The study group is not representative of entire head and neck cancer patients.
3. Non randomization of patients.

Recommendations

This study evaluated patients for radiation induced mucositis twice a week. By this, the exact fraction/dose of development of mucositis can not be assessed properly. Instead if assessed daily, the exact fraction/dose at which the mucositis starts can be known. The effect of honey on the radiation dosimetry should be studied, if it is adopted as one of the modality of treatment of radiation induced mucositis.

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Effect of Honey Dressing on Inflammatory Response of Human Dental Pulp after Pulpotomy

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ABSTRACT

Background: Honey has been used as a medicine since ages. In different studies it has been rediscovered by medical professionals in recent times for treatment of burns, infected wounds, and ulcers because of its high antibacterial, anti-inflammatory antiseptic and antioxidant qualities. The purpose of this study was to evaluate the inflammatory cell response of human dental pulp with honey dressings after pulpotomy.

Materials and Methods: Twenty four teeth from twelve patients to be extracted due to orthodontic reasons were selected. These teeth were divided into two groups and treated with honey and calcium hydro-oxide (Control group) dressings after pulpotomy. Honey was used for 12 teeth and other 12 teeth were given calcium hydro-oxide after pulpotomy. Teeth of six patients were extracted after one week and the other six after four weeks. They were prepared for histological evaluation.

Results: In control group 3 teeth showed inflammatory cell response in grade 1, but 9 (calcium hydro-oxide) teeth showed inflammatory cell response in grade 2. In honey group 5 teeth showed inflammatory cell response in grade 1, and 7 teeth in grade 2.

Conclusion: Honey can be used as alternative to conventional dressing material such as calcium hydroxide dressing after pulpotomy of human dental pulp.

Keywords: Pulpotomy, Honey, Pulp Vitality

INTRODUCTION

The vitality of the dentin-pulp complex is fundamental to the functional life of the tooth and is a priority for targeting clinical management strategies. Not only do the cells of the pulp maintain tissue homeostasis after tooth development, but they also underpin the defense reactions taking place in response to injury, such as caries, and the reparative events leading to tissue regeneration. Signaling of cells to control their behavior and activity is of critical importance to maintaining pulp vitality. Based on these issues and concerns, the ability to maintain or renew dental pulp vitality would be preferable to current endodontic treatments.^{1,2}

When dental pulp exposure is large, or the pulp is infected, all of the coronal pulp must be removed, and direct pulp capping will subsequently be performed adjacent to the root pulp. This method is called pulpotomy.³ After pulpotomy treatment, the dental pulp within the root canal can be preserved. There are two main strategies to achieve a success-

ful vital pulp therapy, to reduce further damage of existing odontoblasts, and to induce the differentiation of new odontoblasts. A successful vital pulp treatment requires a good sealant against bacteria, no severe inflammatory reactions, and stable hemodynamics within the pulp.⁴

Numerous materials have been used as dressings in vital pulp therapy including calcium hydroxide (CH), ZOE cement, formocresol, polycarboxylate cements, inert materials, adhesives, enamel matrix derivative (EMD), beta-tricalcium phosphate and mineral trioxide aggregate.⁵

Honey has been used as a medicine since ages. But it has been rediscovered by medical professionals in recent times for treatment of burns, infected wounds, and ulcers because of its high antibacterial, anti-inflammatory antiseptic and antioxidant qualities.^{6,7} Potential of honey for therapeutic usage in dentistry had been tested for the treatment of infections in wounds following tooth surgery, gingivitis, ulcers, halitosis and periodontal disease.⁸ Even in radiation therapy for oral carcinoma, it is helpful to limit the severity of radiation induced oral mucositis because of its anti-inflammatory properties.⁹ Study conducted for the evaluation of honey as a root canal disinfectant indicates that honey has an antibacterial property when used as an intracanal medicament. The result of clinical evaluation of post-operative pain on 3rd and 7th day shows that honey has an analgesic as well as antibacterial actions and also gives good result to eliminate the apical exudation.^{10,11}

Keeping in view the therapeutic properties of honey, its easy availability and low cost, honey can be used as a dressing material after pulpotomy. Based on clinical observations and literature aim of this study was to describe and compare inflammatory response of human dental pulp tissue on applica-

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tion of dressings of calcium hydroxide and honey.

MATERIAL AND METHODS

This study was conducted at 'Operative Dentistry Department of de'Montmorency College of Dentistry, Punjab Dental Hospital, Lahore, Pakistan. Twenty four human first premolar teeth, scheduled to be extracted for orthodontic reasons, were selected from patients of age ranging between 15-25 years. Patients were selected by convenient non-probability basis. After getting informed consent, two first premolar teeth in every patient were filled after pulpotomy, with materials of each group, so that these materials were evaluated in same oral environment.

Group 1: Pulpotomy with Ca(OH)² dressing (control group)

Group 2: Pulpotomy with honey dressing

All teeth were examined clinically, radiographically and also by electric pulp tester to assure the absence of proximal caries, periapical lesions and tooth vitality.

Coronal pulp was removed, after getting access to dental pulp via cavity preparation, with long shank spoon excavator and irrigated the cavity with anesthetic solution and then dried it with sterile dry cotton pledget. After haemostasis dressings were placed on amputated pulps. After the placement of these dressing materials, teeth were restored with composite resin using glass ionomer cement as a liner. Teeth of six patients were extracted after one week and the other six after four weeks for the subsequent procedure. Teeth were decalcified in 20% formic acid for six to eight weeks, and were prepared in according to normal histological techniques and embedded in paraffin. Six micron sections were cut with microtome parallel to the vertical axis of tooth. The sections were mounted on glass slides and were stained with haematoxylin and eosin. The stained sections were seen microscopically to observe any kind of pulpal cell response. The sections were evaluated in assistance with experienced pathologists and calibrated according to the criteria described as follows:

Inflammatory cell score

Grade 1. Absent or very few inflammatory cells

Grade 2. Mild or average number less than ten inflammatory cells

Grade 3. Severe inflammatory lesion appearing as an abscess or dense infiltrate involving one third or more of the pulp

Grade 4. Completely necrotic pulp

Data was then entered and analysed using SPSS 20.0. This study was approved by Institutional Ethical Review Committee and Board of Advanced Studies.

RESULTS

Descriptive statistics after 7 days

As described in the previous section, a total of 24 teeth were selected from 12 patients, 12 teeth were extracted at day 7

of intervention to see the effects on grade of inflammatory reaction. The 6 control group teeth which had been extracted at day 7, only one teeth showed grade 1 inflammatory reaction while five teeth showed grade 2 inflammatory reaction. As compared to control group, "the Honey" group showed 3 teeth in grade 1 and 3 teeth in grade 2 inflammatory reaction (Table 1). None of the teeth in both groups were fallen in grade grade 3 or 4 at day 7 of the the intervention. When we applied Fisher's Exact Test to see the statistical significance among different types of treatment interventions and inflammatory grades, we found an insignificant p value.

Descriptive statistics after 28 days

After 28 days, in control group, 4 (66.7%) in grade 2 and 2 (33.3%) in grade 1 and in honey group 4 (66.7%) in grade 2 and 2 (33.3%) also in grade 1 which indicates that both groups showed similar in reduction of inflammatory cell score (Table 2). This result shows us that there is no statistically significant association among groups and inflammatory cell score ($p > 0.05$).

DISCUSSION

In the present study, the inflammatory response of human dental pulp with Honey in comparison to Calcium Hydroxide dressings, after pulpotomy was investigated.

In order to cover the shortcomings of calcium hydroxide, a number of materials have been tried, and a continuous research is being done. Few materials have been found to be even better than calcium hydroxide as MTA and New endodontic cement. But they are not used in routine clinical practices, because they are quiet expensive. This would definitely increase the cost of dental treatment. For this reason dentist prefer to use calcium hydroxide for vital pulp therapy. It is needed to search a material that should have better biological properties as well as cheap as calcium hydroxide. Honey is considered to be ideal in this regard, as it has best and proven biological properties, easy to find and of low cost. This study was carried out in an ideal situation because of mechanical exposure and removal of healthy coronal pulp, leaving behind healthy radicular pulp, hence offered more favourable prognosis.^{12,13}

Group		Score				Total
		Grade 1	Grade 2	Grade 3	Grade 4	
1	Control	1	5	0	0	6
2	Honey	3	3	0	0	6

Table-1: Inflammatory cell score among groups

Group		Score				Total
		Grade 1	Grade 2	Grade 3	Grade 4	
1	Control	2	4	0	0	6
2	Honey	2	4	0	0	6

Table-2: Inflammatory cell score among groups

In the present study calcium Hydroxide powder mixed in distilled water was used as a conventional dressing material after pulpotomy. Researches about induction of tissue repair in vital dental pulp therapy and antimicrobial effectiveness in endodontic infections have shown calcium hydroxide as the best option. Two important enzymatic properties of calcium hydroxide are the activation of tissue enzymes, such as alkaline phosphatase, causing a mineralizing effect and the inhibition of bacterial enzymes causing an antimicrobial effect. Its high pH inhibits essential enzyme activities: metabolism, growth and cellular division. The influence of pH alters the integrity of the cytoplasmic membrane by biochemical injury to organic components (proteins, phospholipids) and transport of nutrients.^{14,15}

But many of the samples in this study showed slightly higher inflammatory response with Calcium hydroxide dressings as compared to honey dressings. Calcium Hydroxide has number of shortcomings such as its early dissolution, lack of adhesion, degradation after acid etching, mild to severe pulpal inflammatory reactions, formation of odontoclasts, necrosis of pulp and internal resorption. Honey provided better adhesion due to its viscosity, reduced inflammation or even stopped inflammation and degenerative changes by enhancing regenerative and immune response.¹⁶

In order to cover the shortcomings of calcium hydroxide, a number of materials have been tried, and a continuous research is being done. Few materials have been found to be even better than calcium hydroxide as MTA and New endodontic cement. But they are not used in routine clinical practices, because they are quiet expensive. This would definitely increase the cost of dental treatment. For this reason dentist prefer to use calcium hydroxide for vital pulp therapy.^{17,18} It is needed to search a material that should have better biological properties as well as cheap as calcium hydroxide. Honey is considered to be ideal in this regard, as it has best and proven biological properties, easy to find and of low cost. His study was carried out in an ideal situation because of mechanical exposure and removal of healthy coronal pulp, leaving behind healthy radicular pulp, hence offered more favourable prognosis.

CONCLUSION

Honey shows almost equal or slightly better results in reducing the pulpal inflammation. It can be used as dressing alternative to calcium hydro-oxide in root canal treatment because of its anti inflammatory and antibacterial actions.

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Oxidative Stress: A Possible Mechanism of Atazanavir/Ritonavir Induced Renal Toxicity

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ABSTRACT

Introduction: Atazanavir/ritonavir (ATV/r) renal toxicity may be associated with oxidative stress because oxidative stress has been implicated in drugs induced renal toxicity. This study therefore evaluated the effect of ATV/r on renal function parameters and kidney oxidative stress markers of male albino rats.

Materials and Methods: Adult male albino rats were orally treated with 150/50 mg/kg of ATV/r for 1-4 weeks and (15/5 - 120/40) mg/kg of ATV/r for 8 weeks. Animals were sacrificed at the end of treatment, blood sample was collected and serum extracted and evaluated for serum creatinine, urea, and uric acid levels. Kidneys were collected weighed and evaluated for glutathione (GSH), superoxide dismutase (SOD), catalase (CAT), glutathione-s-transferase (GST), glutathione reductase (GR), glutathione peroxidase (GPX) and malondialdehyde (MDA).

Results: Treatment with ATV/r did not produce any significant ($p > 0.05$) effect on absolute kidney weight when compared to the control. Significant ($p < 0.05$) dose and time-dependent increases in serum creatinine, urea and uric acid levels were observed with ATV/r treatment when compared to the control. Also, significant ($p < 0.05$) dose and time-dependent decreases in kidney SOD, CAT, GST, GSH, GR, and GPX levels with increases in MDA levels occurred with ATV/r treatment when compared to the control.

Conclusion: Observation in this study shows ATV/r induced renal toxicity is time and dose-dependent and may be due to oxidative stress.

Keyword: Atazanavir/ritonavir, Kidney, Toxicity, Oxidative Stress, Rats

human immunodeficiency virus. In January 2004, it was approved by Japan Ministry of Health, Labour and Welfare as an antiretroviral drug for the management of HIV infection. In Europe, 2004 atazanavir was also approved as a once-daily dose of 300 mg boosted with 100 mg of ritonavir. The use of unboosted atazanavir 400 mg daily has also proved effective as a switch strategy and is approved in the USA.² According to current guidelines, atazanavir/ritonavir (ATV/r) is one of the first-line antiretroviral drugs with high efficacy, tolerability, favorable lipid profile and once-daily dosing.³

Atazanavir may be associated with renal toxicity according to Brewster and Perazella (2004)⁴ who first described acute interstitial nephritis associated with atazanavir. Further studies showed that atazanavir renal toxicity may be marked with granulomatous interstitial nephritis (GIN) characterized by crystalluria, and crystal nephropathy.⁵ Epidemiological studies have found that exposure to ATV/r is associated with an increased incidence of renal stones when compared to efavirenz and other protease inhibitors based regimens.⁶ Treatment with ATV/r was associated with increases in serum creatinine, urea levels and increases in urine levels of total protein and albumin.⁷ Cumulative exposure to ATV/r may cause tubular dysfunction leading to decrease glomerular function. Most cumulative exposures to ATV/r were associated with the formation of urolithiasis characterized by acute lumbar or flank pain and gross hematuria.^{8,9} Atazanavir is slightly soluble in water at the concentration of 4–5 mg/ml and increasing alkalinity of urine may stimulate crystallization of atazanavir. Atazanavir crystals are usually 8–20 nm sized, rod like-shaped and mildly birefringent and may be found in few asymptomatic patients receiving atazanavir boosted with ritonavir.¹⁰

Oxidative stress occurs in cells as a consequence of an imbalance between the prooxidant/antioxidant systems. Ox-

INTRODUCTION

The complications of therapy with antiretroviral drugs have become more important than the consequences of human immunodeficiency virus (HIV) infection itself. The kidney which is the organ of drug excretion has become vulnerable to the delivery of antiretroviral drugs and their metabolites due to prolonged therapy which may serve as potential toxins. Antiretroviral drugs and their metabolites may accumulate within the tubular epithelial cells especially in the process of reabsorption or secretion exposing renal tubule to high concentration which may lead to crystallization and subsequently kidney toxicity.¹ Atazanavir boosted ritonavir is one of the commonly used antiretroviral drugs in the management of

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oxidative stress has a critical role in the pathophysiology of renal toxicity and kidney disease. Oxidative stress can cause damage to kidney cellular macromolecules such as nucleic acids, proteins, and lipids. Damage to lipids produces lipid peroxidation products which could lead to a facile propagation of free radical reactions. Also, oxidative kidney damage could lead to downregulation in the activities of kidney antioxidants thereby subjecting the kidney to more oxidative damage.¹¹ Some antiretroviral drugs have been implicated in oxidative kidney damage marked by mitochondria damage, generation of oxidative radicals, lipid peroxidation and down regulation of the activities of endogenous antioxidants.¹² The use of ATV/r may be associated with oxidative stress which has not been evaluated. This study therefore evaluated the dose and time-dependent effects of ATV/r on kidney oxidative stress markers of male albino rats. Also, effects on absolute kidney weight, and serum renal function parameters were evaluated.

MATERIALS AND METHODS

Drugs: Atazanavir/ritonavir used for this study was manufactured by Myland laboratories India. Atazanavir/ritonavir powder was suspended in normal saline. All other chemicals used for this study were of analytical grade.

Animals: Fifty adult male albino rats of average weight 310 ±5 g were used for this study. The animals were obtained from the animal house of the Department of Pharmacology and Toxicology, Madonna University, Elele, Rivers State. The animals were allowed to acclimatize for 14 days and had free access to food and water *ad libitum*.

Drug Administration: This study was divided into three sections; control, time-dependent and dose-dependent studies.

Control: Group A which served as the control group contained 10 animals which were divided into two sub groups A1 (placebo control) and A2 (Solvent control) of 5 animals each. Animals in sub group A1 were treated orally with water while animals in sub group A2 were treated orally with normal saline been the vehicle used for atazanavir/ritonavir in this study.

Time-Dependent Studies: Group C contained 20 animals which were divided into 4 subgroups C1 – C4 of five animals each. Animals in subgroups C1 – C4 were treated orally with 150/50 mg/kg of ATV/r for 1- 4 weeks respectively.

Dose -Dependent Studies: Group D contained 20 animals which were divided into 4 subgroups D1 – D4 of five animals each. Animals in subgroups D1 – D4 were treated orally with 15/5 – 120/30 mg/kg of ATV/r respectively for 8 weeks.

Collection of Sample: Animals were sacrificed at the end of drug treatment with the aid of diethyl ether. Blood sample was collected through cardiac puncture and transferred into a sterile sample container. Blood sample was centrifuged at 1200 rmp for 15 minutes and serum collected for biochemical analysis. Animals were dissected kidneys were collected and weighed. The collected kidneys were washed in an ice cold 1.15% KCL solution. Kidneys were then homogenized with 0.1M phosphate buffer (pH 7.2). The resulting homogenate was centrifuge at 2500rmp speed for 15 minutes then it was removed from the centrifuge and the supernatant was decanted and stored at -20°C until analysis.

Evaluation of Renal Function Parameters: Serum creatinine urea and uric acid were evaluated as reported by Prabu et al., 2010.¹³

Evaluation of Kidney Oxidative Stress Markers: Glutathione (GSH), Superoxide Dismutase (SOD) Catalase (CAT), Glutathione peroxidase, Glutathione S-transferase, and Glutathione reductase were evaluated as reported by Prabu et al., 2010 while Malondialdehyde (MDA) was evaluated as reported by Ahmed and Hassanein, 2013¹⁴

STATISTICAL ANALYSIS

Results are expressed as mean +SEM. Results were analyzed using one way analysis of variance (ANOVA) and statistical significance was set at $p < 0.05$

RESULTS

Time-dependent Studies

Treatment with ATV/r did not produce any significant ($p > 0.05$) time-dependent effects on absolute kidney weight when compared to the control (**Table 1**). Significant ($p < 0.05$) and time-dependent increases in creatinine, urea and uric acid levels were observed in ATV/r treated animals when compared to the control. Increases in serum creatinine levels were observed to represent 41, 55, 70 and 107% respectively at week 1-4. Also, time-dependent increases in serum urea levels were calculated to represent 38, 67, 89 and 121 % respectively at week 1-4 of treatment (**Table 2**). Furthermore, significant ($p < 0.05$) and time-dependent decreases in kidney SOD, GSH, CAT, GSH, GPX, and GST levels with increase in MDA level were observed in animals treated with 150/50 mg/kg of ATV/r for 1-4 weeks when compared to the control. Observed increases in kidney MDA levels represent 50, 88, 126 and 267 % respectively at week 1-4. Furthermore, decreases in kidney GPX (31, 53, 72 and 94%) and GST (41, 58, 80 and 96 %) respectively were observed in ATV/r treated animals for 1-4 weeks. Also, Kidney CAT levels were time-dependently decreased to 27.1±0.03, 20.0±0.06, 18.1±0.05, and 14.3±0.01 respectively while GSH levels were also decreased to 3.40±0.05, 3.00±0.02, 2.51±0.01 and 2.10 ±0.01 respec-

tively after 1-4 weeks of ATV/r treatment (**Table 5**).

Dose- Dependent Studies: Treatment with ATV/r did not produce any significant ($p>0.05$) dose-dependent effects on kidney weight when compared to the control (**Table 1**). Treatment of animals with (15/5 - 120/40) mg/kg of ATV/r for 8 weeks dose-dependently ($p<0.05$) increased serum creatinine, urea and uric acid levels when compared to the control. Dose-dependent increases observed in serum creatinine levels represent 28, 53, 87 and 151 % while increases in serum urea levels represent 27, 50, 100 and 169 % respectively at week 8 (**Table 2**). Furthermore, dose-dependent decreases in kidney SOD, GSH, CAT, GSP, GST and GR levels with increase in MDA level were observed in animals treated with (15/5-120/40) of ATV/r for 8 weeks when compared to the control. Observed dose-dependent decreases in kidney GSH levels represent 34, 44, 64 and 80% while decreases in GR levels represent 35, 49, 69 and 84 % respectively. Furthermore, GPX levels were dose-dependently decreased to 6.33 ± 0.01 , 4.63 ± 0.02 , 2.97 ± 0.04 and 0.41 ± 0.04 while GST levels were decreased to 5.21 ± 0.01 , 2.70 ± 0.01 , 1.20 ± 0.02 and 0.32 ± 0.15 respectively in animals treated with (15/5-120/40) ATV/r for 8 weeks (**Table 4**).

DISCUSSION

This study did not observe any effect on absolute kidney weight in ATV/r treated animals. Serum uric acid, urea and

creatinine levels were dose and time-dependently increased in ATV/r treated animals. Also, dose and time-dependent decreases were observed in kidney SOD, GSH, CAT, GSH, GPX, GR and GST levels with increase in MDA level in ATV/r treated animals. Urea and creatinine are metabolic waste products that are freely filtered by the glomeruli of the kidneys. In most clinical and toxicological investigations, their serum concentrations are commonly used as surrogate markers of renal toxicity^{15,16}, therefore increases observed in these serum parameters in ATV/r treated animals suggest signs of renal toxicity. This observation is consistent with some studies that were not time and dose-dependent.^{17,18} Observed increases in these parameters maybe due to ATV/r induced kidney damage because studies have shown that damage to tissues and organs could result in the elevation of serum and tissue concentrations of specific biochemical parameters as a result of their release or secretions from the damaged tissues/organs.¹⁹

Antioxidants are vital defense network that protect organs from free radicals induced oxidative damage. Super oxide dismutase scavenges superoxide anions while catalase catalyzes the dismutation of superoxide anion radicals to hydrogen peroxide which is degraded into a molecule of oxygen and water. Decreases observed in the levels of these antioxidants suggest signs of oxidative damage and can precipitate accumulation of superoxide anions leading to more kidney damage^{20,21} Glutathione scavenges oxidative radicals, glutathione peroxidase reduces hydrogen peroxide and hy-

Parameter	Control	Duration of Treatment with 150/50 mg/kg of ATV/r			
		Week1	Week2	Week 3	Week4
Kidney weight(g)	0.77±0.03	0.73±0.05	0.72±0.07	0.89±0.03	0.85±0.02
Parameter	Control	Dose (mg/kg) administered for 8 Weeks			
		15/5	30/10	60/20	120/40
kidney weight (g)	0.75±0.03	0.70±0.01	0.71±0.03	0.89±0.03	0.83±0.07

ATV/r: Atazanavir. Results are expressed as mean ± SEM.

Table-1: Effect of treatment with atazanavir/ritonavir on absolute kidney weight of male albino rats

Parameters	Control	Duration of Treatment with 150/50mg/kg of ATV/r			
		Week1	Week2	Week 3	Week4
Urea	20.0±0.03	28.2±1.00*	34.0±0.70*	38.4±1.00*	45.0±0.10*
Creatinine	1.63±0.07	2.30±0.01*	2.53±0.02*	2.78±0.01*	3.39±1.06*
Uric acid	1.52±0.03	2.20±0.03*	2.41±0.05*	2.64 ±0.05*	2.91±0.02*

Creatinine, Urea, Uric acid (mg/dl). Results are expressed as mean ± SEM, the superscript* means significant difference with respect to the control at $p<0.05$ (ANOVA)

Table-2: Time-dependent effects of treatment with 150/50 mg/kg of atazanavir/ritonavir on serum renal function parameters of male albino rats

Parameters	Control	Duration of Treatment with ATV/r (mg/kg)			
		15/5	30/10	60/20	120/40
Urea	20.0±0.03	25.9±0.10*	30.6±0.02*	40.8±1.00*	54.7±0.02*
Creatinine	1.63±0.07	2.10±0.02*	2.50±0.02*	3.06±0.05*	4.10±0.04*
Uric acid	1.52±0.03	1.98.±0.05*	2.10±0.05*	3.01±0.30*	4.15±0.01*

Creatinine, Urea, Uric acid (mg/dl). Results are expressed as mean ± SEM, the superscript* means significant difference with respect to the control at $p<0.05$ (ANOVA)

Table-3: Dose-dependent effects of treatment with atazanavir/ritonavir on serum renal function parameters of male albino rats

Parameters	Control	Dose (mg/kg)			
		15/5	30/10	60/20	120/40
MDA	0.53±0.01	0.70±0.02*	0.91±0.04*	1.30±0.07*	2.00±0.01*
GSH	6.25±0.02	4.07±0.07*	3.50±0.01*	2.21±0.05*	1.21±0.03*
SOD	10.3±0.04	7.02±0.05*	5.73±0.06*	3.64±0.01*	1.61±0.02*
CAT	45.7±0.06	35.3±0.01*	26.2±0.02*	17.4±0.05*	10.1±0.03*
GST	7.50±0.02	5.21±0.01*	2.70±0.01*	1.20±0.02*	0.32±0.15*
GPX	9.21±0.06	6.33±0.01*	4.63±0.02*	2.97±0.04*	0.41±0.04*
GR	0.65±0.07	0.42±0.13*	0.33±2.10*	0.20±0.05*	0.10±0.04*

MDA: Malondialdehyde, (nmol/mg protein), GSH: Glutathione, CAT: Catalase, SOD: Superoxide dismutase (Unit/mg protein), GST: Glutathione-s-transferase ($\mu\text{mol}/\text{min mg protein}$) GR: Glutathione reductase (nmol/min mg protein), GSP: Glutathione peroxidase ($\mu\text{g}/\text{min mg protein}$). Results are expressed as mean \pm SEM, the superscript (*) means significant difference with respect to the control at $p < 0.05$ (ANOVA)

Table-4: Dose-dependent effects of treatment with atazanavir/ritonavir on kidney oxidative stress markers of male albino rats

Parameter	Control	Duration of Treatment with 150/50mg/kg of ATV/r			
		Week1	Week2	Week 3	Week4
MDA	0.53±0.01	0.80±0.01*	1.00±0.05*	1.20±0.02*	1.42±0.07*
GSH	6.25±0.02	3.40±0.05*	3.00±0.02*	2.51±0.01*	2.10±0.01*
SOD	10.3±0.04	6.10±0.07*	4.54±0.02*	4.00±0.03*	3.12±0.02*
CAT	45.7±0.06	27.1±0.03*	20.0±0.06*	18.1±0.05*	14.3±0.01*
GST	7.50±0.02	4.40±0.00*	3.10±0.01*	1.50±1.32*	0.30±0.05*
GPX	9.21±0.06	6.30±0.04*	4.30±0.02*	2.50±1.04*	0.55±0.08*
GR	0.65±0.07	0.35±0.03*	0.28±0.07*	0.25±0.25*	0.20±0.04*

MDA: Malondialdehyde, (nmol/mg protein) GSH: Glutathione, CAT: Catalase, SOD: Superoxide dismutase. (Unit/mg protein) GST: Glutathione-s-transferase ($\mu\text{mol}/\text{min mg protein}$) GR: Glutathione reductase (nmol/min mg protein), GSP: Glutathione peroxidase ($\mu\text{g}/\text{min mg protein}$). Results are expressed as mean \pm SEM, the superscript* means significant difference with respect to the control at $p < 0.05$ (ANOVA)

Table-5: Time-dependent effects of treatment with atazanavir/ritonavir on kidney oxidative markers of male albino rats

droperoxide while glutathione-s-transferase conjugates xenobiotic electrophilic substances with GSH to form the corresponding GSH-S-conjugate. Decreases in glutathione peroxidase and glutathione levels observed in ATV/r treated animals suggest signs of oxidative kidney damage through free radical production.^{22,23} Malondialdehyde (MDA) is one of the final products of polyunsaturated fatty acids peroxidation in cells. It is a known marker of oxidative stress and antioxidant status²⁴; hence increase in malondialdehyde level observed in the kidneys of ATV/r treated animals is a sign of lipid peroxidation. Observations in this study maybe due to the ability of ATV/r to accumulate and form crystals in the kidney stimulating renal mitochondria damage leading to the release of oxidative radicals.²⁵ The release of oxidative radicals might have stimulated damage to lipids, membranes, proteins, and DNA in the kidney²⁶

Furthermore, ATV/r combination is an antiretroviral agent and studies have shown that antiretroviral agents induced kidney injury can occur through three pathways. The over-expression or competitive inhibition of transport pumps which could lead to tubular cell toxicity, the activation of the mitogen-activated protein kinase pathway which can affect barrier function in renal epithelial cell cascade and the induction of oxidative stress which could damage mitochondria, disrupting fatty-acid oxidation, and energy production.^{27,28} Available studies suggest the involvement of oxidative stress as one of the postulated mechanisms in the pathogenesis

of drug induced nephrotoxicity. Oxidative stress can induce dysfunction of cell membrane permeability and loss of functional integrity of the kidney.²⁹ Oxidative stress can promote the formation of a variety of vasoactive mediators that can affect renal function directly by initiating renal vasoconstriction or decreasing the glomerular capillary ultra filtration coefficient; and thus reducing glomerular filtration rate.³⁰ Considering observations in this study, ATV/r induced renal toxicity may involve oxidative stress as one of the possible mechanisms. Oxidative stress involves the generation of free radicals; hence the ability of ATV/r to generate free radicals in the kidney may be evaluated to further buttress the involvement of oxidative stress in ATV/r induced renal toxicity.

CONCLUSION

In this study, treatment with ATV/r produced dose and time-dependent increases in renal function parameters, kidney malondialdehyde and decreases in antioxidants. This shows ATV/r induced renal toxicity is dose and time-dependent and may be associated with oxidative stress as one of the possible mechanisms. The use of ATV/r is still safe because higher doses were used for this study.

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Role of High Frequency Ultrasonography for Detection of Radiolucent Foreign Bodies and Their Surgical Management

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ABSTRACT

Introduction: Delayed presentation of foreign bodies has been reported from the developing world since many decades. They are usually missed on the initial evaluation owing to the vague history or the radiolucent nature of the presenting foreign body.

Materials and Methods: This study was conducted on 44 consecutive patients reporting to our institution with a suspected retained foreign body in the musculoskeletal system and in whom standard radiography failed to demonstrate a foreign body. Ultrasound was performed using high-resolution (10 MHz) ultrasound system. After confirming the diagnosis, foreign body removal was carried out by surgical exploration.

Results: Most common sites of injury was hand involved in 34% followed by foot and ankle in 23% patients. Time of presentation ranged from 1 day to 20 weeks. Predominant chief complaints of the patients were: foreign body sensation 43% patients and pain in 23% patients. Wooden splinters were most common variety of foreign body present in 48% patients followed by Nail slipper injury (rubber) present in 16% patients. Length of the foreign body as given by ultrasound ranged from 3 mm to 30 mm.

Conclusion: Sonography is a safe, cost effective, portable, readily available and highly sensitive method to evaluate radiolucent foreign bodies, especially, in patients with clinical suspicious of foreign bodies that may remain undiagnosed in radiography. It also gives important information about the nature, size, depth, and relationship of foreign bodies to other structures and makes exploration easier for the surgeon.

Keywords: High resolution ultrasound, Foreign body, Wooden splinters, Nail slipper injury.

bone and joint destructive lesions, granulomas, with impairment of tendon mobility or triggering of digits, delayed tendon ruptures, neurodeficits, pyogenic granulomas.⁴ Foreign bodies may also migrate to deeper soft tissues, into the joints or even into blood vessels with possible embolic complications. Long-term retention of foreign bodies has also led to the onset of tumors.² Errors in preoperative localization may lead to prolonged operational and massive soft tissue injury. A missed foreign body may remain undetected even after exploration.^{4,5}

Foreign bodies can seldom be identified and removed on the basis of clinical examination alone and usually only when in a superficial location. Otherwise, imaging techniques are required to identify the foreign body and establish its exact location prior to surgical removal attempt.² Metallic materials are opaque on radiographs. However, it is imperative for referring physicians to understand that thorns, splinters, wooden fragments, and pieces of plastic are usually not sufficiently opaque to be visualized on radiographs.⁶ In such situations, other imaging modalities like ultrasound, CT and MRI are needed for diagnosis.⁷ CT has a higher cost, involves ionizing radiation, may have limited availability and can involve anesthesia in pediatric cases. MRI also has a higher cost and limited availability for evaluating nonmetallic foreign bodies. Evaluation of metallic foreign body is a contraindication for MRI. In addition, MRI often does not allow differentiation of foreign bodies from other structures that can also have low signal intensity such as scar tissue, tendons, and calcifications.⁸

Sonography has emerged as a preferred imaging modality in this setting. Many in vitro experiments and human stud-

INTRODUCTION

Foreign bodies are any objects originating outside the body. They frequently occur due to various accidental injuries such as traffic accidents, explosions or bursts, and gunshot injuries¹ and usually consist of wooden or metal splinters or glass shards or thorns, causing pain and/or functional impairment.² Some of these foreign bodies are obvious in the initial physical examination and can be removed.³ The missed foreign body may remain asymptomatic for prolonged periods or else lead to a wide range of complications including pain, abscess, chronic discharging wound, necrotizing fasciitis,

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ies have reported high sensitivity of sonography in detection of soft tissue foreign bodies. Sonography has been reported to show the size, shape, and location of soft-tissue foreign bodies. It has also been used to guide removal of foreign bodies. Additionally, easy availability, lack of radiation, and relatively low cost are advantages of sonography.⁹ High-frequency ultrasound (≥ 7.5 MHz) identifies foreign bodies with a sensitivity of 87-93% and a specificity of 89-99%.¹⁰ These are visualized as hyper-echoic foci with accompanying acoustic shadows. The shadow may be either partial or complete depending on the angle of insonation and the composition of the foreign body. A hypo-echoic halo surrounding the foreign object is sometimes seen, which represents edema, an abscess or granulation tissue. Aside from diagnosis, ultrasound is an effective adjunct for the actual localization of the foreign object in relation to muscles, tendons, vessels, and nerves.^{6,11}

Limitations of US evaluation for soft-tissue foreign bodies include operator dependence. Familiarity with the US appearances of soft-tissue foreign bodies and a systematic evaluation of the region of interest in both the longitudinal and transverse orientations are needed for accurate assessment. A high-frequency linear transducer (7.5 MHz or higher) is needed to optimize near field spatial resolution.¹²

The purpose of this study was to determine the role of high frequency ultrasonography for detection of radiolucent foreign bodies and their surgical management.

MATERIALS AND METHODS

This study was conducted on 44 consecutive patients reporting to our institution with a suspected retained foreign body in the musculoskeletal system and in whom standard radiography failed to demonstrate a foreign body. The study period was from September 2011 to April 2015. The study was conducted after obtaining approval from hospital ethics committee. All radiographs were reviewed by a senior radiologist. These patients were then taken for further evaluation by ultrasound scan. Ultrasound scans were performed in the department of radio diagnosis of our hospital by one of the experienced radiologists using high-resolution (10 MHz) ultrasound system (Sonosite. MICROMAX). In order to localize the foreign body the area of interest was scanned in both the longitudinal and transverse orientations. The surrounding soft tissue was also examined for fluid collections, tendon disorders, and injury to neurovascular structures. In ultrasound, linear lesion with distal acoustic shadow and surrounding hypo-echoic area was suggestive of foreign body. Localization of foreign body was done in relation to skin depth and surrounding muscle, bone or tendon. The opposite (contra-lateral) side was used as a control.

After confirming the diagnosis, foreign body removal was carried out by surgical exploration.

The patients' demographic data, mode of injury, duration of symptoms, clinical, sonographic findings and surgical find-

ings were recorded.

RESULTS

There were 34 (77%) males and 10 (23%) females with a mean age of 29 years (range 3-58 years) (Table 1). Most common sites of injury was left upper limb (15 patients). Anatomically hand was involved in 15 (34%), foot and ankle in 10 (23%), digits in 6 (13.5%), forearm in 5 (11%), elbow in 1 (2.5%), calf in 4 (9%), knee in 2 (4.5%) and buttock in 1 (2.5%) patient respectively. Many patients had multiple foreign bodies, and one of them had 4 wooden splinters in her forearm. Surgery was performed in 44 patients and 58 foreign bodies were successfully removed.

Time of presentation ranged from 1 day to 20 weeks. Predominant chief complaints of the patients were: foreign body sensation in 19 (43%), abscess in 6 (14%), discharging wound in 5 (11%), pain in 10 (23%) and palpable mass in 3 (7%) patients respectively. One patient presented with contracture of third toe. Wooden splinters (Fig 1, 2) were most common variety of foreign body present in 21 (48%) patients followed by Nail slipper injury (rubber) present in 7 (16%) patients, thorn 5 (11%), glass 5 (11%), plastic 3 (7%), stone 2 (4.5%), and graphite in 1(2.5%) patient respectively.

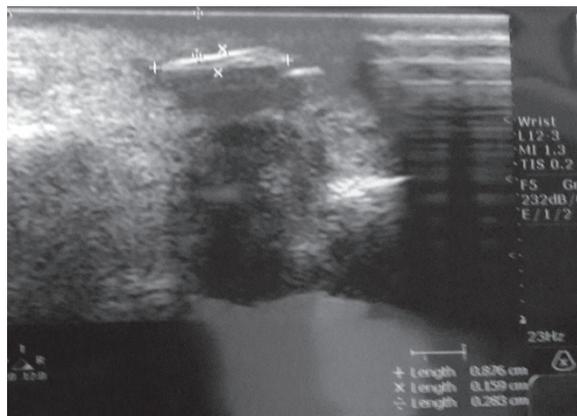


Figure-1: Ultrasonography of a patient showing foreign body in dorsum of hand



Figure-2: Wooden splinter measuring 20 mm extracted from patient after surgical exploration

S. No	Age/Sex	Duration	Number/ Nature of Foreign bodies	Size (mm)	Anatomical Site
1	32/ F	2 wks	4 wooden splinters (broomstick)	5, 9,12,30	Left Forearm
2	18/ F	3 days	1 Thorn	4	Right index finger
3	35 /M	4 wks	1 wooden splinter	6	Palm right hand
4	58 /M	2 wks	1 wooden splinter	6	Palm right hand
5	42/M	6 days	1 Glass splinter	3	Left forearm
6	38/M	16 wks	1 Rubber (Nail slipper injury)	8	Sole of Right foot
7	19/M	2 wks	1 wooden splinter	7	Left middle finger
8	33/M	8 wks	2 wooden splinters	7, 8	Palm Left hand
9	24/M	12 wks	1 Rubber (Nail slipper injury)	15	Sole of Right foot
10	22/F	4 days	2 wooden splinters	12, 16	Palm Right hand
11	22/M	7 days	1 Glass splinter	7	Right knee
12	5/M	6 days	1 Thorn	4	Right index finger
13	46/M	8 wks	1 wooden splinter	4	Left Ankle
14	8/F	10 wks	1 wooden splinter	12	1 st web left hand
15	35/F	9 days	1 Glass splinter	4	Right leg
16	38/M	18 wks	1 Rubber (Nail slipper injury)	8	Sole of Left foot
17	26/M	4 wks	1 plastic splinter	4	Palm Left hand
18	21/M	6 wks	1 Plastic splinter	5	Left index finger
19	28/F	3 wks	3 wooden splinters (broomstick)	10,12,12	Right Leg
20	58/M	20 wks	1 Rubber (Nail slipper injury)	10	Sole of Left foot
21	14/M	12 wks	1 wooden splinter	5	Left Forearm
22	30/M	4 wks	1 Thorn	3	Dorsum left hand
23	54/M	10 wks	2 Stone fragments	5,7	Right Knee
24	45/F	6 days	2 wooden splinter (broomstick)	10,25	Right forearm
25	32/M	18 wks	1 Rubber (Nail slipper injury)	6	Sole of Right foot
26	38/M	12 wks	1 wooden splinter	5	1 st web Right hand
27	6/M	20 wks	1 Stone fragment	5	Sole of Left foot
28	3/F	4 days	1 wooden (Toothpick)	7	Left Elbow
29	36/M	5 wks	1 Plastic Splinter	4	Right index finger
30	24/M	8 wks	1 wooden splinter	5	Left leg
31	22/M	3 wks	3 Glass splinters	4,5,4	Right Leg
32	32/M	12 wks	1 wooden splinter	20	Dorsum left hand
33	24/F	4 days	1 Glass splinter	8	Right forearm
34	32/M	12 wks	2 Thorns	4,4	Palm left hand
35	7/M	6 days	1 Pencil lead (Graphite)	5	Right Buttock
36	24/M	4 wks	1 wooden splinter	12	Right Ankle
37	38/M	7 days	2 Thorns	4,5	Right index finger
38	44/M	6 wks	1 wooden splinter	8	Palm Right hand
39	16/M	4 wks	1 wooden splinter	8	1 st web Right hand
40	26/M	12 wks	1 Rubber (Nail slipper injury)	10	Sole of Left foot
41	22/M	16 wks	1 Rubber (Nail slipper injury)	8	Sole of Left foot
42	46/M	1 day	2 wooden splinters	8,15	Palm Left hand
43	20/F	4 wks	1 wooden splinter (broomstick)	7	2 nd web left hand
44	28/M	4 wks	1 wooden splinter	5	Dorsum Left hand

Table-1: Patient demographics and observations

Length of the foreign body as given by ultrasound ranged from 3 mm to 30 mm (mean length was 8 mm). The smallest foreign body detected was a thorn which measured 3 mm in length present in the dorsum of left hand.

All patients were symptom free at follow-up and no short- or long-term complications were recorded.

DISCUSSION

A retained foreign body in the soft tissues of extremities is

not very common. Diagnosis requires high index of suspicion⁷ Several imaging modalities are available for detection and localization of non-radiopaque foreign body in soft tissue. Conventional radiographs should be obtained to rule out the presence of radiopaque foreign objects. As traditional radiograms are widely available, simple to perform and inexpensive, X-ray is the reference examination and will identify radiopaque FBs (glass, metal, Stone) in around 80% of cases,² but radiolucent bodies like wooden splinters are difficult to detect and usually missed. The missed foreign bodies

may produce immediate symptoms like wound infections or may remain asymptomatic for even decades.⁵ Generally, organic materials such as thorn, wood and fish bones have low density in radiography and may remain undetected. Although materials such as plastic and glass are radiopaque, they may remain undetected in plain radiography due to the lower density in the plain radiography but plastic materials have less density and may go undetected.¹³ Wood, thorn and aluminum are radiolucent and cannot be detected by plain films¹⁴ Studies conducted by Anderson *et al*¹⁵ and Levine *et al*¹⁶ showed that only 15% and 7% of radiolucent foreign bodies appeared in radiographic studies, respectively. Studies done by Oikarnen *et al*¹⁷ and Manthey DE *et al*¹⁸ observed that conventional radiography is not able to detect radiolucent foreign body at all. In present study also no radiolucent foreign body was detected in plain radiographs.

CT scan, MRI and ultrasonography are other investigation modalities advocated for evaluation of non metallic foreign body. CT and MRI are useful to identify objects, approximate size, and determine relationships to nearby structures.⁸ Computed tomography (CT) and magnetic resonance (MR) scans are very expensive and have very limited indications for FB detection as they have poor sensitivity and specificity² High-resolution ultrasonography is a reliable diagnostic tool in the detection of radiolucent foreign bodies in musculoskeletal system as it has a sensitivity and specificity of 90% and 96%, respectively.² Because of its high spatial resolution, ultrasound can identify FBs smaller than a millimeter¹⁹, be they wood, glass, metal or plastic.¹² Ultrasonographic evaluation provides important information of the foreign body and also associated complications. Ultrasound is also accurate in predicting the foreign body's exact location, size, depth, orientation, and relationship to other structures.⁸

There were 34 (77%) males and 10 (23%) females with a mean age of 29 years (range 3-58 years). Studies done by Crawford R⁴ and Tahmasebi M *et al*⁵ also showed male predominance. This may be possibly due to high involvement of males in outdoor activities compared to females.

Time of presentation ranged from 1 day to 20 weeks which is similar to studies done by most of the authors.

Predominant chief complaints of the patients were foreign body sensation in 19 (43%) and pain in 10 (23%) patients. Studies done by Crawford R⁴ and Tahmasebi M *et al*⁵ also showed pain and foreign body sensation as predominant symptom.

Anatomically hand was involved in 15 (34%), foot and ankle in 10 (23%). This is in contrary to the studies done by most authors which showed foot and ankle involvement more than hand. The possible reason for this might be barefoot walking in underdeveloped nations.

Wooden splinters were most common variety of foreign body removed surgically in 21 (48%) patients followed by Nail slipper injury (rubber) present in 7 (16%) patients. The results are similar to the studies done by Crawford R *et al*⁴, Sonali S *et al*⁹, Anderson¹⁵ and Prakash *et al*.²⁰

In our study ultrasound was found to be accurate in predicting not only the size of the foreign body but also its exact location, depth, orientation and relationship to other structures. High resolution ultrasound makes the surgeon sound to localize accurately the foreign body thus making the removal easier, less time consuming and resulting in minimal tissue handling and operating time. It also reduces the chances of negative explorations in patients having doubtful history.

CONCLUSION

Sonography is a safe, cost effective, portable, readily available and highly sensitive method to evaluate radiolucent foreign bodies, especially, in patients with clinical suspicious of foreign bodies that may remain undiagnosed in radiography. It also gives important information about the nature, size, depth, and relationship of foreign bodies to other structures and makes exploration easier for the surgeon.

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A Comparative Study of Intrathecal Fentanyl and Dexmedetomidine as Adjuvants to Bupivacaine

K. Sunil Kumar¹, G. Bharathi¹, R. Pandu Naik², B. Srinivas Rao³

ABSTRACT

Introduction: Spinal anaesthesia is the most preferred regional anaesthesia technique. Present study was done to study the efficacy of Intrathecal Fentanyl and Dexmedetomidine with 0.5% heavy Bupivacaine for infra umbilical surgeries.

Materials and Methods: 100 patients belonging to ASA physical status I & II of both sexes were divided into two groups of 50 each. Group F received 3ml Inj.0.5% Bupivacaine heavy with 25 micrograms of Fentanyl and Group D received 3ml Inj 0.5% Bupivacaine heavy with 5 micrograms of Dexmedetomidine. The time of onset of sensory and motor block, haemodynamic status, duration of analgesia and adverse effects if any were compared in both the groups.

Results: Time from injection to highest sensory level and Onset of Bromage 3 was similar in both groups. Time from injection to T10 sensory level was significantly shorter in Group D ($p<0.001$), and Time for regression to Bromage 0 was significantly longer in group D ($p<0.001$). Intraoperatively both groups remained haemodynamically stable. Incidence of bradycardia was more in Group D and incidence of pruritus was more in Group F though it was not statistically significant ($p=0.402$). Intraoperative sedation was higher in Group D ($p<0.001$) and post operatively Visual analogue scores were significantly lower with group D ($p<0.001$)

Conclusion: Dexmedetomidine appears to be an attractive adjuvant to intrathecal bupivacaine than Fentanyl as there is significantly longer duration of motor block, additional benefits of intraoperative sedation and decreased analgesic requirement in the post-operative period.

Keywords: Intrathecal; bupivacaine; fentanyl; dexmedetomidine; bromage; sedation

longs the duration of spinal block.

Therefore, the present study was performed to compare Fentanyl and Dexmedetomidine in their efficacy as adjuvants to sub arachnoid block.

MATERIALS AND METHODS

A randomised controlled study was done in 100 patients, posted for major surgeries, below umbilical level, in Kakatiya Medical College and M.G.M Hospital.

Inclusion Criteria

ASA physical status class I and II, Age between 18 – 65 years of either sex.

Exclusion Criteria

Emergency surgery, Deformities of the spine, Hypersensitivity to any of the drugs in the study, Contraindications to spinal anaesthesia – patient refusal, bleeding diathesis.

After approval from the ethical committee of our college, Pre-operative assessment was done and further evaluated for any systemic diseases. Laboratory investigations recorded. The procedure of spinal anaesthesia was explained to the patients and written consent was obtained. The patients were educated about the use of visual analogue scale. Preparation of patients included period of overnight fasting. Patients were premedicated with Tab.Ranitidine 150 mg and Tab. Alprazolam 0.5 mg H.S.

Preparation Of Operating Theatre

Boyle's anaesthesia machine was checked. Appropriate size endotracheal tubes, working laryngoscope with medium and large size blades, stylet and working suction apparatus were

INTRODUCTION

Spinal anaesthesia is the most preferred regional anaesthesia technique as it is easy to perform, economical and produces rapid onset of anaesthesia and complete muscle relaxation. The aim of intrathecal local anaesthetic is to provide adequate sensory and motor block necessary for all infra umbilical surgeries. Hyperbaric bupivacaine is the most commonly used intrathecal local anaesthetic.

Various adjuvants have been added to bupivacaine to shorten the onset of block and prolong the duration of block. Fentanyl, a lipophilic opioid agonist, is used as an adjuvant, which prolongs the duration of spinal block. Dexmedetomidine, an α -2 agonist drug, when given intrathecally, significantly pro-

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kept ready before the procedure. Emergency drug tray consisting of atropine, adrenaline, mephenteramine, ephedrine and dopamine were kept ready.

Group F received 3ml, 0.5 % hyperbaric bupivacaine + 25 µg Fentanyl (vol 0.5ml) Group D received 3ml, 0.5 % hyperbaric bupivacaine + 5 µg Dexmedetomidine (vol 0.5 ml). Intraoperatively pulse rate, non-invasive blood pressure, electrocardiogram, SpO₂ was recorded, every 2 minutes for the first 10 minutes, every 10 minutes for the next 50 minutes and every 15 minutes till the end of surgery. Time of onset of T₁₀ sensory block and peak sensory block was noted using pin prick method, time of onset of Bromage 3 motor block was noted.

Motor block was assessed with Modified Bromage scale

Bromage 0 - the patient is able to move the hip, knee and ankle

Bromage 1 - the patient is unable to move the hip but is able to move the knee and ankle

Bromage 2 - the patient is unable to move the hip and knee but able to move the ankle

Bromage 3 - the patient is unable to move the hip, knee and ankle.

Modified Ramsay sedation scale was used for intraoperative sedation

1. = agitated, restless
2. = cooperative, tranquil
3. = responds to verbal commands while sleeping
4. = brisk response to glabellar tap or loud noise while sleeping
5. = sluggish response to glabellar tap or loud noise while sleeping
6. = no response to glabellar tap or loud noise while sleeping

Following parameters were recorded

Hypotension (> 20 % fall of baseline blood pressure) was treated with bolus dose of 6 mg ephedrine i.v.

Bradycardia (pulse rate < 50 bpm), was treated with 0.6 mg atropine i.v.

Incidence of respiratory depression defined as respiratory rate less than 9 /min and SpO₂ less than 90 % on room air, was noted. Side effects if any were noted. Post operatively regression of the sensory block and the motor blockade to reach modified Bromage 0 was noted

Pain was assessed using “Visual Analogue Scale” advocated by Revill and Robinson in 1976. It is linear scale, consists of 10 cm line anchored at one end by a label such as “No pain” and other end by “Worst pain imaginable”. Patient simply marks the line to indicate the pain intensity. Supplemental analgesia was given for visual analogue score of more than 6. Time of supplemental analgesia was noted.

Visual analogue scale was used to assess post-operative pain.

Statistical analysis

Descriptive statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean ± SD (Min-Max) and results on categorical measurements are presented in Number (%). Significance is assessed at 5 % level of significance. Statistical analysis was done by applying Chi-square test, Anova test and students ‘t’ test to analyse the data, p value was determined.

RESULTS

Age in years	Group F		Group D	
	No	%	No	%
18-20	2	4.0	0	0.0
21-30	3	6.0	4	8.0
31-40	13	26.0	26	52.0
41-50	22	44.0	14	28.0
51-60	8	16.0	5	10.0
>60	2	4.0	1	2.0
Total	50	100.0	50	100.0
Gender				
Male	25	50.0	25	50.0
Female	25	50.0	25	50.0
Total	50	100.0	50	100.0
ASA grade				
Grade I	26	52.0	31	62.0
Grade II	24	48.0	19	38.0
Total	50	100.0	50	100.0
Distribution of ASA grade is statistically similar in two groups with P = 0.41				

Table-1: Demographic distribution of patients studied

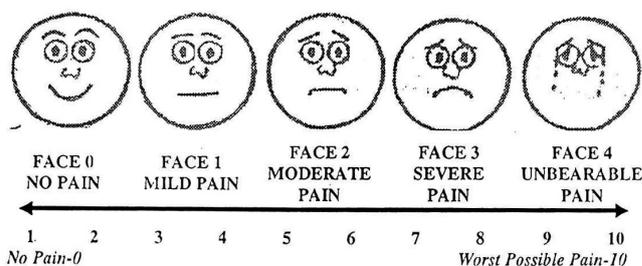


Figure-1: Visual analogue scale

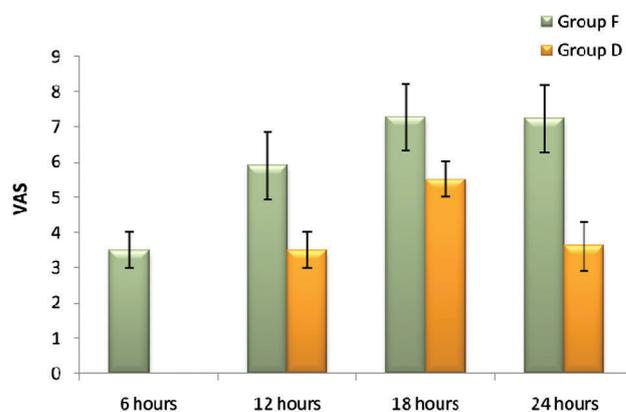


Figure-2: Comparison of Visual analogue scale of two groups

Surgery	Group F (n=50)		Group D (n=50)	
	No	%	No	%
Vaginal hysterectomy	10	20.0	11	22.0
Abdominal hysterectomy	8	16.0	1	2.0
ORIF	7	14.0	10	20.0
TURP	3	6.0	1	2.0
URS	2	4.0	3	6.0
Mesh repair	3	6.0	1	2.0
Below knee procedure	2	4.0	3	6.0
Stripping and ligation	3	6.0	1	2.0
Tension band wiring	2	4.0	1	2.0
Implant removal	0	0.0	2	4.0
Interval appendectomy	0	0.0	2	4.0
Fistula repair	0	0.0	1	2.0
Screw fixation	0	0.0	1	2.0
Skin grafting	0	0.0	1	2.0
Internal urethrotomy	1	2.0	1	2.0
DHS	1	2.0	0	0.0
Others	8	16.0	10	20.0

Table-2: Surgery in two groups of patients studied

Variables	Group F	Group D	P value
Time from injection to T10 (minutes)	3.38±0.83	2.62±0.56	<0.001
Time from injection to highest sensory level (minutes)	11.47±1.23	11.72±1.23	0.314
Onset of Bromage 3(minutes)	10.38±1.08	10.59±1.00	0.317
Regression to bromage 0(minutes)	152.90±8.31	419.70±16.85	<0.001

Table-3: Comparison of variables in the study

Highest sensory level	Group F		Group D	
	No	%	No	%
T8	0	0.0	19	38.0
T7	12	24.0	2	4.0
T6	16	32.0	14	28.0
T5	7	14.0	1	2.0
T4	15	30.0	14	28.0
Total	50	100.0	50	100.0

Table-4: Highest sensory level of patients studied

Side effects	Group F (n=50)		Group D (n=50)	
	No	%	No	%
Nausea	3	6.0	0	0.0
Vomiting	1	2.0	0	0.0
Pruritus	3	6.0	0	0.0
Hypotension	14	28.0	8	16.0
Bradycardia	0	0.0	7	14.0
Urinary retention	0	0.0	0	0.0
Respiratory depression	0	0.0	0	0.0

Table-5: Side effects of patients in two groups studied

DISCUSSION

Spinal anaesthesia is the most preferred regional anaesthesia technique as it is easy to perform, produces rapid onset

of anaesthesia and complete muscle relaxation and is also economical. These advantages are sometimes offset by a relatively short duration of action.

The aim of intrathecal local anaesthetic is to provide adequate sensory and motor block necessary for all infra umbilical surgeries. Hyperbaric bupivacaine is the most commonly used intrathecal local anaesthetic. Various adjuvants have been added to bupivacaine to shorten the onset of block and prolong the duration of block.

Fentanyl, a lipophilic opioid agonist, is used as an adjuvant, which prolongs the duration of spinal anaesthesia. Fentanyl is a lipophilic μ -receptor opioid agonist. Intrathecally, Fentanyl exerts its effect by combining with opioid receptors in the dorsal horn of spinal cord and may have a supraspinal spread and action.⁵

Dexmedetomidine, an α -2 agonist drug, when given intrathecally, significantly prolongs the duration of spinal anaesthesia. Intrathecal α -2 receptor agonists have been found to have antinociceptive action for both somatic and visceral pain.⁶ Therefore, the present study was performed to compare Fentanyl and Dexmedetomidine in their efficacy as adjuvants to spinal anaesthesia. In our study, the intrathecal dose of Dexmedetomidine selected was based on previous animal studies. A number of animal studies conducted using intrathecal Dexmedetomidine at a dose range of 2.5-100 μ g did not report any neurologic deficits with its use.

In our study design Group F received 0.5% of hyperbaric Bupivacaine 3ml with Fentanyl 25 μ g and Group D received 0.5% hyperbaric Bupivacaine 3ml with Dexmedetomidine 5 μ g, injected intrathecally to the patients undergoing infraumbilical surgeries. Time of onset of action, Highest level of sensory and motor blockade, Time of onset of Bromage 0, Intraoperative heart rate, Blood pressure, SpO₂, Intraoperative sedation, Regression to Bromage 3 and Post-operative requirement of analgesia were noted.

Kanazi et al.⁷ found that 3 μ g Dexmedetomidine or 30 μ g clonidine added to 13 mg spinal bupivacaine produced the same duration of sensory and motor block with minimal side effects in urologic surgical patients. From Kanazi study and animal studies, we assumed that 3-5 μ g Dexmedetomidine would be equipotent to 30-45 μ g clonidine when used for supplementation of spinal bupivacaine.

Our study has shown that the addition of 5 μ g Dexmedetomidine with hyperbaric bupivacaine significantly prolongs both sensory and motor block. Both Fentanyl and Dexmedetomidine provided good quality intraoperative analgesia. The analgesia was clinically better in group D as compared to group F. Small doses of intrathecal Dexmedetomidine (3 μ g) used in combination with bupivacaine in humans have been shown to shorten the onset of motor block and prolong the duration of motor and sensory block with haemodynamic stability and lack of sedation.

Al-Ghanem et al.⁸ had studied the effect of addition of 5 μ g Dexmedetomidine or 25 μ g Fentanyl intrathecal to 10 mg isobaric bupivacaine in vaginal hysterectomy and concluded

that 5 µg Dexmedetomidine produces more prolonged motor and sensory block as compared with 25 µg Fentanyl.

In our study, in the Dexmedetomidine group we found longer duration of both sensory and motor blockade and good patient satisfaction.

Al-Mustafa et al⁹ studied effect of Dexmedetomidine 5µg and 10 µg with bupivacaine in urological procedures and found that Dexmedetomidine prolongs the duration of spinal anaesthesia in a dose-dependent manner. Visceral pain usually occurs during abdominal surgery under spinal anaesthesia. Intrathecal Fentanyl when added to local anaesthetics reduces visceral and somatic pain. In our study also no patient perceived visceral pain in both D and F groups.

Rajni Gupta, Reetu Verma, Jaishri Bogra et al,¹⁰ used Dexmedetomidine as an intrathecal adjuvant for post-operative analgesia and found that the addition of 5 µg Dexmedetomidine to ropivacaine intrathecally produces prolongation in the duration of motor and sensory block. They also found that intraoperative ephedrine requirement was more in group D as compared to group R. In our study intraoperative incidence of hypotension was higher in group F.

Rajni Gupta, Reetu Verma, Jaishri Bogra et al,¹⁰ conducted a comparative study of intrathecal Dexmedetomidine 5µ gm and Fentanyl 25µ gm as adjuvants to bupivacaine and found that intrathecal Dexmedetomidine is associated with prolonged motor and sensory block, haemodynamic stability, and reduced demand for rescue analgesics in 24 hrs as compared to Fentanyl. In our study also the post-operative analgesic requirements was significantly less in the Dexmedetomidine group than group Fentanyl. They also found that the sedation score was more in group D patients. The mean sedation score was 3.8 ± 0.5 in group D as compared to 2.2 ± 0.53 in group F, which was statistically significant ($P < 0.05$). In our study the mean sedation score for group F was 2.16 ± 0.37 and group D was 3.40 ± 0.49 , which was statistically significant ($p < 0.001$)

There was no incidence of respiratory depression. Pruritus after intrathecal Fentanyl is known but it was not significant in the present study. The α -2 adrenergic agents also have antishivering property as observed by Talkeet al¹¹ and Maroof M et al.¹² We too did not find any incidence of shivering.

CONCLUSION

Addition of 5 µg Dexmedetomidine with hyperbaric bupivacaine significantly prolongs both sensory and motor block. Intraoperatively, there was less incidence of side effects with Intrathecal Dexmedetomidine when compared to Intrathecal fentanyl.

The post-operative 24 hours analgesic requirements was significantly less in the Dexmedetomidine group than group Fentanyl. To conclude, 5 µg Dexmedetomidine seems to be an attractive alternative to 25 µg Fentanyl as an adjuvant to spinal bupivacaine in surgical procedures. It provides good quality of intraoperative analgesia, haemodynamically sta-

ble conditions, minimal side effects, and excellent quality of postoperative analgesia.

Hence, Dexmedetomidine seems to be a better choice as Intrathecal adjuvant with Bupivacaine when compared with Fentanyl.

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Comparative Evaluation of the Renal Profile of Some Propionic Acids (NSAIDs) in Male Albino Rats

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ABSTRACT

Introduction: Propionic acids (NSAIDs) are associated with renal toxicity; therefore, this study comparatively evaluated the renal profile of propionic acids (NSAIDs) in adult male albino rats.

Materials and Methods: Adult male albino rats were orally treated with ibuprofen (IF) (250mg/kg), naproxen (NX) (140 mg/kg), ketoprofen (KF) (30mg/kg) and fenoprofen (FF) (170mg/kg) for 14 days. Animals were sacrificed, serum extracted and evaluated for urea (UR), creatinine (CR), uric acid (UA), total protein (TP), albumin (AB) and electrolytes (N⁺, K⁺, Ca⁺, Cl⁻ and HCO₃⁻). Also, kidneys were harvested and evaluated for malondialdehyde (MDA), superoxide dismutase (SOD), catalase (CAT), glutathione (GSH), glutathione peroxidase (GPX), glutathione transferase (GST), and glutathione reductase (GR).

Results: Treatments with these agents did not produce significant ($p < 0.05$) effects on absolute kidney weight, body weight and kidney/body weight ratio when compared to the control. Also, effects on serum electrolytes produced by these agents were insignificant ($p > 0.05$) when compared to the control. Serum UR, CR, UA levels were significantly ($p < 0.05$) increased while TP and AB levels were decreased by these agents when compared to the control. Increases in UR (173, 89, 79 and 144%), CR (152, 85, 81 and 109 %) and UA (157, 87, 83 and 127 %) respectively were obtained with IF, FF, KF and NX treatments. Kidney MDA level was significantly ($p < 0.05$) increased while CAT, GSH, SOD, GPX, GST and GR levels were decreased when compared to the control. Decreases in CAT (80, 60, 47 and 65%), GSH (79, 51, 50 and 69 %), SOD (76, 45, 44 and 66%), GPX (78, 55, 52 and 68%), GST (80, 60, 55 and 70%) and GR (89, 54, 51 and 70) levels respectively were observed with IF, FF, KF and NX treatments.

Conclusion: This study shows adverse renal effects of these evaluated propionic acids may be ranked in this order; IF > NX > FF > KF

Keywords: Propionic Acids, Kidney, Antioxidants, Toxicity, Rats

matoid arthritis, osteo-arthritis, ankylosing spondylitis and postoperative pain.² The uses of propionic acids have been associated with renal toxicity attributed to inhibition of cyclooxygenase. Inhibition of COX (Cyclooxygenase) can alter the metabolism of eicosanoids, including prostaglandins (PGs), thromboxane, and leukotrienes, which are derived from arachidonic acid. Cyclooxygenase is the rate-limiting enzyme for the conversion of arachidonic acid to the labile intermediate PGH₂, which serves as a substrate for other PGs, such as PGE₂ and PGD₂.² The inhibition of prostaglandins synthesis from arachidonic acid by NSAIDs could lead to vasoconstriction and a decrease in glomerular capillary pressure, resulting in a prompt decline in glomerular filtration rate.⁴ Also, oxidative stress characterized by decreased kidney antioxidants has been implicated in drugs induced renal toxicity and may be a factor in NSAIDs renal toxicity. Oxidative stress can stimulate the formation of vasoactive mediators that can initiate renal vasoconstriction or decrease the glomerular capillary ultrafiltration coefficient; and thus reducing glomerular filtration rate.⁵

Propionic acids and other NSAID-related renal syndromes include fluid and electrolyte disorders, acute renal dysfunction, nephrotic syndrome/interstitial nephritis, and renal papillary necrosis. NSAIDs are a known cause of acute kidney injury (AKI) which may remain undiagnosed because it may be moderate, asymptomatic, transitory, and non-anuric.⁷ AKI can occur from NSAID induced renal interstitial inflammation, resulting in acute interstitial nephritis.⁸ Also, acute renal dysfunction occurs with the short term use of NSAIDs which might progress to acute tubular necrosis and substantial loss of renal function up to the point of requiring dialysis support with continuation of NSAIDs therapy.⁹ Interstitial

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INTRODUCTION

Propionic acids are non-steroidal anti-inflammatory drugs (NSAIDs) which are widely used. These agents share anti-inflammatory, analgesic, and antiplatelet properties and also have many side effects in common. They are used for the treatment of musculo-skeletal disorders, such as rheu-

nephritis and renal papillary necrosis which are markers of chronic renal failure occur with the chronic use of NSAIDs due to high dose administration over a long period.¹⁰ Due to the frequent use of propionic acids and reported renal toxicity; therefore, this study comparatively evaluated the renal profile of propionic acids (NSAIDs) in male albino rats. Comparative evaluation of the adverse renal profile of propionic acids will enhance their rational selection, decrease nephrotoxicity and add to therapeutic benefits.

MATERIALS AND METHODS

Materials

Ibuprofen (Ranbaxy Pharm India), Naproxen (Ranbaxy Pharm India), Ketoprofen (Nicholas Piramal India) and Fenoprofen (Ranbaxy Pharm India). All other chemicals used for this study were of analytical grade

Animals

Thirty adult male rats of average weight 310 ± 5 g were used for this study. Animals were obtained from the animal house of the Department of Pharmacology and Toxicology, Madonna University Elele, Rivers State. Animals were grouped in cages and were allowed to acclimatize for 14 days and had free access to food and water *ad libitum*.

Grouping of animals and drug administration

Animals were divided into 6, groups A-F of 5 animals each. Animals in group A (placebo control) and group B (solvent control) orally received water and normal saline respectively. Animals in groups C-F received oral doses of ibuprofen (250mg/kg) naproxen (140 mg/kg), ketoprofen (30mg/kg) and fenoprofen (170mg/kg) for 14 days respectively. Doses used for this study represent 10 times their clinical doses.¹¹ Higher doses were used for this study because laboratory animals metabolize and excrete drugs faster than humans and to simulate toxic levels of the drugs in the animals.¹²

Collection of Samples

At the end of drug therapy animals were sacrificed with the aid diethyl ether, blood sample was collected in a non-heparinized sample container via cardiac puncture. The Blood sample was allowed to clot, centrifuged and serum was collected and evaluated for biochemical parameters. Animals were dissected, kidneys were collected and washed in an ice cold 1.15% KCL solution. Kidneys were then homogenized with 0.1M phosphate buffer (pH 7.2). The resulting homoge-

nate was centrifuge at 2500rpm speed for 15 minutes then it was removed from the centrifuge and the supernatant was decanted and stored at -20°C until analysis.

Evaluation of Renal Function Parameters

Total protein and albumin were evaluated as reported by Ibiam et al., 2013¹³ while serum creatinine, urea, and uric acid were evaluated as reported by Prabu et al., 2010.¹⁴

Evaluation of Kidney Oxidative Stress Markers

Glutathione (GSH), Superoxide Dismutase (SOD), Catalase (CAT) Glutathione peroxidase, Glutathione S-transferase and Glutathione reductase were evaluated as reported by Prabu et al., 2010¹⁴ while malondialdehyde was evaluated as reported by Ahmed et al., 2013¹⁵

STATISTICAL ANALYSIS

All the tested parameters were subjected to statistical analysis. Statistical analysis was done by One-way Analysis of Variance (ANOVA) and means were compared by Dunnettes comparison.

RESULTS

Treatments with these agents did not produce significant effects ($p < 0.05$) on body weight, absolute kidney weight and kidney/body weight ratio when compared to the control. (Table 1). These agents produced significant ($p < 0.05$) increases in serum creatinine, urea and uric acid levels with decreases in serum albumin and total protein levels when compared to the control. Observed increases in serum urea levels by IF, FF, KF and NX treatments represent 173, 89, 79 and 144% respectively. Also, observed increases in serum creatinine levels by IF, FF, KF and NX represent 152, 85, 81 and 110% respectively. Furthermore, uric acid levels were increased by IF, FF, KF and NX treatments to 156, 87, 83 and 127% respectively. In this study, observed changes produced by these agents on serum electrolytes were insignificant ($p > 0.05$) when compared to the control (Table 2 and 3). Observation in this study shows significant ($p < 0.05$) decreases in kidney SOD, CAT, GSH, GPX, GST and GR levels with increase in MDA level in animals treated with these agents when compared to the control. Observed decreases in GSH levels by IF, FF, KF and NX treatments represent 79, 51, 50 and 69% respectively. Also, IF, FF, KF and NX induced increases in CAT levels represent 80, 60, 47 and 65% respectively. Fur-

Drugs	Initial body Weight (g)	Final body weight (g)	Kidney weight (g)	Kidney/body weight ratio
Control	310.0 \pm 1.02	370.6 \pm 1.10	0.88 \pm 0.02	0.0024 \pm 0.09
Ibuprofen	297.2 \pm 1.11	320.1 \pm 2.15	0.90 \pm 0.01	0.0028 \pm 0.03
Ketoprofen	300.0 \pm 1.15	335.6 \pm 3.10	0.85 \pm 0.09	0.0025 \pm 0.07
Fenoprofen	330.1 \pm 2.00	352.2 \pm 2.14	0.80 \pm 0.02	0.0023 \pm 0.01
Naproxen	320.4 \pm 1.75	340.7 \pm 1.16	0.87 \pm 0.07	0.0027 \pm 0.06

Table-1: Effects of propionic acids (NSAIDs) on the body weight, absolute kidney weight and kidney weight/body weight ratio of male albino rats

thermore, treatments with IF, FF, KF and NX produced the following decreases in SOD (74, 46, 44 and 66%), GPX (78, 55, 52 and 68%) and GST (80, 60, 55 and 70%) respectively. Kidney malondialdehyde level was significantly ($P<0.05$) increased to 1.23 ± 0.01 , 0.910 ± 0.03 , 0.87 ± 0.05 and 1.04 ± 0.08 nmole / mg protein in IF, FF, KF and NX treated animals respectively (Table 4).

DISCUSSION

Kidneys receive about 25% of the cardiac output and are the major organ for drug excretion; hence the renal arterioles and glomerular capillaries are vulnerable to the effects of drugs.¹⁶ Propionic acids are non-steroidal anti-inflammatory drugs (NSAIDs) that are most commonly used as over-the-counter medications and are known to have adverse effects on kidney function.¹⁷ This study comparatively evaluated the adverse renal effects of propionic acids (ibuprofen, fenoprofen, ketoprofen and naproxen) in male albino rats. Effects were evaluated on serum electrolytes (Na^+ , K^+ , Cl^- , Ca^{2+} , HCO_3^-), creatinine, urea, uric acid levels. Also, effects were evaluated on kidney MDA, GSH, CAT, SOD, GPX, GR, GST, and GR levels. In this study, treatments with propionic acids (NSAIDs) increased serum creatinine, urea and uric acid levels with decreases in total protein and albumin

levels. This observation is consistent with previous studies which reported changes in these parameters with the uses of NSAIDs.^{18,19} Maximal effects on these parameters were observed in ibuprofen treated animals followed by naproxen, fenoprofen and ketoprofen. Effects observed on serum levels of these parameters suggest signs of kidney damage because serum concentrations of these evaluated parameters are commonly used as surrogate markers of renal toxicity.²⁰ Serum electrolytes are regulated by the kidney and their serum levels are fundamental indices for renal toxicity and adverse cardiovascular events.²¹ This study observed changes in serum electrolytes in animals treated with propionic acids. This is in agreement with previous reports that associated the uses of NSAIDs with electrolytes and acid-base disturbances.²² Furthermore, kidney MDA level was increased while antioxidants (GSH, CAT, SOD, GPX, GR, GST, and GR) were decreased by these agents. Increases observed in kidney MDA levels with decreases in kidney antioxidants were maximal in ibuprofen treated animals. This study observed that adverse renal profile of these propionic acids may be ranked in this order; ibuprofen > naproxen > fenoprofen > ketoprofen. This connotes that ibuprofen will produce more adverse renal effect while ketoprofen will produce the least effect.

In this study, observed increases in serum creatinine, urea

Drugs	Urea (mg/dL)	Creatinine (mg/dL)	Uric acid (mg/dl)	Total protein (g/dl)	Albumin (g/dl)
Control	20.1±0.06	1.65±0.02	1.46±0.02	6.30±0.20	3.71±0.03
Ibuprofen	54.9±0.03 ^a	4.15±0.23 ^a	3.75±0.06 ^a	3.00±0.01 ^a	1.10±0.07 ^a
Fenoprofen	37.9±0.04 ^b	3.05±0.01 ^b	2.63±0.04 ^b	4.21±0.01 ^b	2.71±0.01 ^b
ketoprofen	35.9±0.06 ^b	2.98±0.09 ^b	2.67±0.01 ^b	4.28±0.07 ^b	2.75±0.06 ^b
Naproxen	49.0±0.08	3.44±0.06 ^c	3.31±0.09 ^c	3.24±0.08 ^c	1.17±0.08 ^c

Values represent means ±S.E.M, n= 5. Values with different superscript in the same column are significantly different at ($p<0.05$).

Table-2: Effects of treatment with propionic acids (NSAIDs) on serum renal function parameters of male albino rats

Dose	Na^+ (mmol/l)	K^+ (mmol/l)	Cl^- (mmol/l)	Ca^{2+} (mg/dl)	HCO_3^- (mmol/l)
Control	120.0±2.06	3.42±0.06	122.6±3.02	10.2±0.01	20.2±0.03
Ibuprofen	135.2±2.11	3.86±0.09	135.0±2.61	11.8±0.12	19.1±0.01
fenoprofen	130.0±1.28	3.69±0.07	124.2±0.06	10.9±0.16	19.9±0.06
ketoprofen	127.1±3.15	3.61±0.04	127.7±0.15	10.4±2.00	20.0±0.03
Naproxen	132.4±1.43	3.70±0.06	130.0±0.09	11.0±0.36	18.7±0.09

Values represent means ±S.E.M, n= 5

Table-3: Effects of treatment with propionic acids (NSAIDs) on serum electrolytes in male albino rats

Parameters	Control	Ibuprofen	Fenoprofen	ketoprofen	Naproxen
MDA	0.51±0.06	1.23±0.01 ^a	0.90±0.03 ^b	0.87±0.05 ^b	1.04±0.08 ^c
GSH	9.65±0.02	2.00±0.06 ^a	4.72±0.06 ^b	4.82±0.09 ^b	3.00±0.04 ^c
CAT	30.2±1.08	6.16±0.12 ^a	12.1±0.35 ^b	15.9±0.20 ^b	10.6±0.16 ^c
SOD	15.6±0.03	3.82±0.08 ^a	8.47±0.06 ^b	8.71±0.02 ^b	5.20±0.27 ^c
GPX	9.80±0.19	2.11±0.01 ^a	4.38±0.01 ^b	4.70±0.03 ^b	3.10±0.04 ^c
GST	10.7±0.05	2.10±0.26 ^a	4.27±0.01 ^b	4.82±0.01 ^b	3.20±0.12 ^b
GR	0.87±0.06	0.10±0.01 ^a	0.40±0.01 ^b	0.43±0.07 ^b	0.26±0.04 ^c

MDA: Malondialdehyde, (nmol/mg protein), GSH: Glutathione, CAT: Catalase, SOD: Superoxide dismutase (Unit/mg protein), GST: Glutathione-s-transferase ($\mu\text{mol}/\text{min mg protein}$) GR: Glutathione reductase (nmol/min mg protein), GSP: Glutathione peroxidase ($\mu\text{g}/\text{min mg protein}$). Values represent means ±S.E.M, n= 5. Values with different superscript in the same row are significantly different ($p<0.05$).

Table-4: Effects of treatments with propionic acids (NSAIDs) on kidney oxidative indices of male albino rats

and uric acid may be due to reduced renal plasma flow caused by inhibition of prostaglandins (PG) synthesis by these agents. Studies have shown that prostaglandins regulate renal function by modulating both intrarenal vascular tone, salt and water excretion. In particular, PGE₂ contributes to the regulation of renal perfusion and glomerular filtration rate in virtue of its vasodilation property, which counteract the actions of vasoconstrictive substances such as angiotensin II, catecholamines, vasopressin, and endothelin.^{23,24} Also, increases in serum creatinine, urea and uric acid levels may be due to oxidative stress induced by these agents in the kidneys of treated animals. Because oxidative stress can promote the formation of vasoactive mediators that can affect renal function directly by initiating renal vasoconstriction or decreasing the glomerular capillary ultrafiltration coefficient; and thus reducing glomerular filtration rate.²⁵ Changes in serum electrolytes observed in this study are common adverse effects of NSAIDs characterized by decrease sodium, water and potassium excretion and edema. The NSAIDs attenuate the release of renin mediated by prostaglandins which may reduce the formation of aldosterone and, as a consequence, decrease the excretion of potassium. Furthermore, in the presence of decreased glomerular flow, the opposition to the natriuretic and diuretic effects of prostaglandins by the NSAIDs can increase sodium and water reabsorption in the renal tubule, with a decrease in the Na⁺-K⁺ exchange in the distal nephron.²⁶

Observe increase in kidney MDA level with decreases in antioxidants in animals treated with these agents may be due to oxidative stress induced by these agents. Antioxidants scavenge free radicals and prevent biomolecules from oxidative damage.^{27,28} Studies have shown that decreases in the levels of antioxidants suggest signs of oxidative stress.²⁹ Malondialdehyde (MDA) is one of the final products of polyunsaturated fatty acids peroxidation in cells. It is a known marker of oxidative stress and antioxidant status³⁰; hence increase in malondialdehyde level observed in this study is a sign of lipid peroxidation. Pronounced renal toxicity observed in ibuprofen treated animals may be due to the ability of ibuprofen to inhibit prostaglandin synthesis and/or induce oxidative stress more than other propionic acids evaluated in this study. Findings in this study may be further validated by evaluating the effects of these agents on urine levels of creatinine, urea, uric acid, albumin, total protein, and electrolytes. Also, effects on free radicals generation in the kidney may be evaluated.

CONCLUSION

The adverse renal profile of propionic acids evaluated in this study may be ranked in this order; ibuprofen > naproxen > fenoprofen > ketoprofen. Pronounced renal toxicity observed with ibuprofen treatment may be due to inhibition of prostaglandins synthesis and/or induction of kidney oxidative stress more than other propionic acids evaluated in this study.

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Risk Assessment of Co-treatment with Tenofovir and Rifampicin on Kidney Oxidative Stress Markers of Male Albino Rats

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ABSTRACT

Introduction: Rifampicin (RIF) and tenofovir (TDF) may be associated with oxidative kidney damage; hence co-therapy with tenofovir-rifampicin in human immunodeficiency virus and tuberculosis co-infection may be characterized by synergistic oxidative kidney damage. This study, therefore evaluated the toxicological effect of co-treatment with tenofovir-rifampicin on kidney oxidative stress markers of male albino rats.

Materials and Methods: Adult male rats used for this study were divided into five groups A-E of sixteen animals (16) each. Animals in group A (placebo control) were orally treated with water, while animals in group B (solvent control) were orally treated with arachis oil. Animals in groups C-D were orally treated with 80 mg/kg of rifampicin, 32 mg/kg of tenofovir and tenofovir-rifampicin for 1-8 weeks respectively. At the end of drug therapy animals were sacrificed kidney collected and analyzed for superoxide dismutase, catalase, glutathione, glutathione-s-transferase, and malondialdehyde.

Results: Co-treatment with tenofovir-rifampicin insignificantly ($p>0.05$) decreased superoxide dismutase, catalase, glutathione, and glutathione-s-transferase levels with increase in malondialdehyde level when compared to treatments using individual doses of rifampicin and tenofovir.

Conclusion: This study shows co-therapy with tenofovir-rifampicin may not be associated with synergistic oxidative kidney damage.

Keywords: Rifampicin, Tenofovir, Kidney, Oxidative Stress, Rats

suffer drugs related renal damage.³ Several human and animal studies have reported tenofovir induced damage to proximal tubules, resulting in Fanconi syndrome, characterized by bicarbonate wasting, phosphaturia, amino aciduria, glycosuria, acidosis, and hypophosphatemia.^{4,5} Also, increases in serum creatinine, urea and uric acid levels are frequent features in patients on tenofovir containing antiretroviral regimens.⁶ Tenofovir renal toxicity has been associated with various degrees of histopathological damage characterized by proximal tubular injury, tubular necrosis, tubulointerstitial scarring and mitochondria damage.⁷ Tenofovir renal toxicity was also reported to be associated with reduction in the activities of proximal tubular glutathione, catalase, and superoxide dismutase.⁸ These antioxidants are integral part of kidney defense system; hence depletion will predispose the kidney to oxidative injury.

Rifampicin is used in combination with other anti-tuberculosis drugs in the treatment of tuberculosis. It has bactericidal activity against organisms that are dividing rapidly and against semi-dormant bacterial populations, thus accounting for its sterilizing activity.⁹ Its mechanism of action involves binding to β subunit of bacterial DNA-dependent RNA polymerase in prokaryotic, but not in eukaryotic cells thereby inhibiting RNA synthesis.¹⁰ The use of rifampicin has contributed to decrease in morbidity and mortality rate due to tuberculosis, but its use has been associated with renal toxicity characterized by acute renal failure.¹¹ Rifampin renal toxicity may be associated with increases in serum levels of creatinine, urea and uric acid. Also, histopathological changes characterized by tubulointerstitial nephritis, tubular necrosis, papillary necrosis and acute cortical necrosis are common features of rifampicin induced kidney damage.¹² Rifampicin induced kidney damage has been characterized by depletion

INTRODUCTION

The kidney performs several excretory and regulatory functions including blood pressure control, maintenance of extracellular environment and drug excretion.¹ The kidney is highly vulnerable to injury due to constant exposure to chemical agents which may lead to accumulation in the kidney causing damage to the architecture of the kidney. Drugs are known to precipitate mitochondrial damage in the kidney which could result in the overproduction of reactive oxygen species (ROS) and reactive nitrogen species (RNS), leading to oxidative and nitrosative damage to the lipids, proteins and DNA in the kidney.²

Renal toxicity is a dose limiting toxicological effect of tenofovir, one of the first line antiretroviral drugs. About 3% of patients on tenofovir containing antiretroviral drugs may

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of kidney antioxidants (glutathione peroxidase, catalase, superoxide dismutase) and increase in malondialdehyde level which may increase the vulnerability of kidney to oxidative injury.¹³

Rifampicin containing anti-tuberculosis regimes and tenofovir containing antiretroviral regimens are used as co-therapy for the management of human immunodeficiency virus and tuberculosis co-infection.¹⁴ Because rifampicin and tenofovir are individually associated with kidney damage characterized by decrease in kidney antioxidants. Co-therapy with these drugs may synergistically deplete kidney antioxidants which may be of grave consequence. This study, therefore evaluated the toxicological effect of co-treatment with tenofovir- rifampicin on kidney oxidative stress markers of male albino rats.

MATERIALS AND METHODS

Drug

Rifampicin used for this study was manufactured by Man-care Pharmaceuticals, India while pure sample of tenofovir disoproxilfumarate was purchased from Shijiazhuang Aop-harm Import & Export Trading Co., Ltd. Shijiazhuang, China. All other chemicals used for this study were of analytical grade.

Animals

Eighty (80) adult male albino rats of average weight 330 ± 5 g were used for this study. The animals were obtained from the animal house of the Department of Pharmacology and Toxicology, Madonna University, Elele, Rivers State. The animals were allowed to acclimatize for 14 days and had free access to food and water *ad libitum*.

Dose Selection and Drug Preparation

The doses of rifampicin and tenofovir disoproxil fumarate used for this study were 80mg/kg and 32mg/kg respectively and were higher than the clinically recommended doses.^{15,16} Rifampicin and tenofovir disoproxil fumarate powder were suspended in arachis oil^{17,18}

Grouping of Animals and Drug Administration

Animals were divided into five groups A – E of 16 animals per group. Animals in each group were further sub divided into four groups of four animals each. Animals in group A (placebo control) were orally treated with water while animals in group B (solvent control) were orally treated with arachis oil. Animals in groups C-E were orally treated with 80 mg/kg of RIF, 32 mg/kg of TDF and TDF- RIF combination for 1-8 weeks respectively.

Collection of Sample for Analysis

At 1, 2, 4 and 8 weeks, after overnight fast, animals were dissected under diethyl ether anesthesia; kidney collected and washed in an ice cold 1.15% KCL solution. Kidney was

then homogenized with 0.1M phosphate buffer (pH 7.2). The resulting homogenate was centrifuge at 2500rpm speed for 15minutes then it was removed from the centrifuge and the supernatant was decanted and stored at -20°C until analysis.

Evaluation of Kidney Oxidative Stress Markers

Kidney malondialdehyde, superoxide dismutase, glutathione, catalase, and glutathione- S- transferase levels were evaluated using methods reported by Ahmed and Hassainein, 2013¹⁹

STATISTICAL ANALYSIS

Results are presented as mean \pm SEM. Statistical significance and differences from control and test values were evaluated using one way Analysis of Variance (ANOVA). Statistical probability of $p < 0.05$ was considered to be significant.

RESULTS

Treatment with TDF for 1-8 weeks produced time-dependent decreases in kidney GSH levels with significant ($p < 0.05$) decreases observed at weeks 6 and 8 when compared to the control. Also, treatment with rifampicin produced time-dependent decreases in GSH levels with significant ($p < 0.05$) decrease observed at week 8 with respect to the control. But effects produced by individual doses of these agents on GSH levels were insignificant ($p > 0.05$) when compared to effects produced by their combined doses (Table 1). Also, kidney SOD levels were time-dependently decreased in animals treated with individual doses of TDF and RIF with significant ($p < 0.05$) difference from the control observed at weeks 6 and 8. These observed decreases were insignificant ($p > 0.05$) when compared to decreases produced by combined doses of TDF and RIF (Table 2). The following kidney CAT values 40.8 ± 0.20 , 35.1 ± 0.22 , 25.2 ± 0.20 and 20.5 ± 0.24 U/mgprotein were obtained in TDF treated animals for 1-8 weeks respectively. These values represent time-dependent decreases in kidney CAT levels with significant ($p < 0.05$) difference from the control observed at weeks 6 and 8. Furthermore, co-treatment with TDF-RIF produced time-dependent decreases in kidney CAT levels but, these decreases were insignificant ($p > 0.05$) when compared to treatments using individual doses of TDF and RIF (Table 3). This study also noticed time-dependent decreases in GST levels in animals treated with individual doses of TDF and RIF. These dose-dependent decreases were observed to be significant ($p < 0.05$) at weeks 6 and 8 in TDF treated animals while significant ($p < 0.05$) difference was observed at week 8 in RIF treated animals when compared to the control. But, these dose-dependent decreases were insignificant ($p > 0.05$) when compared to decreases produced by their combined doses (Table 4). Furthermore, kidney MDA levels were time-dependently increased in animals treated with individual doses of TDF and RIF. Increases were observed to be significant ($p < 0.05$) at weeks 6 and 8 in TDF treated animals while sig-

nificant ($p < 0.05$) increase was observed at week 8 in RIF treated animals when compared to the control. Increases in MDA levels were insignificant ($p > 0.05$) in animals treated with a combination of TDF-RIF when compared to increases observed in animals treated with individual doses of TDF and RIF (Table 5).

DISCUSSIONS

Kidney has cellular antioxidants that protect it from chem-

icals induced damage.²⁰ These antioxidants are usually depleted in drugs induced oxidative kidney injury and additive or synergistic depletion of antioxidants can occur with concurrent use of drugs.²¹ This study, therefore evaluated the toxicological effect of co-treatment with tenofovir-rifampicin on kidney glutathione, superoxide dismutase, catalase, glutathione-s-transferase and malondialdehyde levels. In this present study, time-dependent increases in malondialdehyde levels with decreases in superoxide dismutase, glutathione, catalase and glutathione -s-transferase levels were

Dose	WK1	WK2	WK4	WK8
Control (A)	5.21±0.05	5.29±0.01	5.20±0.02	5.24±0.05
TDF 32mg/kg	5.17±0.04	4.32±0.03	3.02±0.04*	2.26±0.07*
RIF 80mg/kg	5.10±0.06	4.91±0.05	4.32±0.02	3.10±0.03*
TDF/RIF	4.07±0.03	4.23±0.03	3.01±0.08*	2.02±0.08*

TDF: Tenofovir. RIF: Rifampicin GSH: Glutathione (u/mgprotein). Results are expressed as mean ± SEM, the superscript (*) means significant difference with respect to the control at $p < 0.05$ (ANOVA).

Table-1: Effect of treatment with tenofovir and rifampicin on kidney glutathione of male albino rats

Dose	WK1	WK2	WK4	WK8
Control (A)	6.50±0.01	6.47±0.01	6.49±0.05	6.51±0.06
TDF 32mg/kg	6.32±0.05	5.21±0.03	3.82±0.08*	3.47±0.02*
RIF 80mg/kg	6.35±0.05	6.09±0.01	5.43±0.01	3.87±0.03*
RIF/TDF	5.60±0.01	5.10±0.06	3.61±0.08*	3.13±0.05*

TDF: Tenofovir, RIF: Rifampicin, SOD: Superoxide Dismutase (u/mgprotein). Results are expressed as mean ± SEM, the superscript * means significant difference with respect to the control at $p < 0.05$ (ANOVA).

Table-2: Effect of treatment with tenofovir, and rifampicin on kidney superoxide dismutase of male albino rats

Dose	WK1	WK2	WK4	WK8
Control (A)	43.0±0.12	42.9±0.26	43.1±0.13	42.7±0.15
TDF 32mg/kg	40.8±0.20	35.1±0.22	25.2±0.20*	20.5±0.24*
RIF 80mg/kg	42.3±0.03	38.75±0.15	35.5±0.31	24.7±1.21*
TDF/RIF	38.2±0.05	34.0±0.22*	23.1±0.18*	18.3±0.42*

TDF: Tenofovir. RIF: Rifampicin CAT: Catalase (u/mgprotein). Results are expressed as mean ± SEM, the superscript * means significant difference with respect to the control at $p < 0.05$ (ANOVA).

Table-3: Effect of treatment with tenofovir and rifampicin on kidney catalase of male albino rats

Dose	WK1	WK2	WK4	WK8
Control (A)	8.70±0.07	8.77±0.09	8.69±0.05	8.71±0.01
TDF 32mg/kg	7.90±0.03	7.30±0.04	5.10±0.01*	4.73±0.07*
RIF 80mg/kg	8.13±0.07	7.42±0.08	6.97±0.07	5.12±0.02*
RIF/TDF	7.90±0.06	7.20±0.05	5.01±0.08*	4.60±0.07*

TDF: Tenofovir, RIF: Rifampicin, GST: Glutathione-S-Transferase (μmol/min mg protein), Results are expressed as mean ± SEM, the superscript * means significant difference with respect to the control at $p < 0.05$ (ANOVA).

Table-4: Effect of treatment with tenofovir, and rifampicin on kidney glutathione-s-transferase of male albino rats

Dose	WK1	WK2	WK4	WK8
Control (A)	1.52±0.01	1.60±0.01	1.53±0.04	1.49±0.05
TDF 32mg/kg	1.71±0.02	2.03±0.01	3.21±0.07*	4.10±0.04*
RIF 80mg/kg	1.62±0.03	1.85±0.05	2.13±0.01*	3.21±0.04*
TDF/RIF	1.80±0.02	1.90±0.06	3.5±0.03*	4.4±0.02*

TDF: Tenofovir. RIF: Rifampicin. MDA: malondialdehyde (nmole/mgprotein). Results are expressed as mean ± SEM, the superscript * means significant difference with respect to the control at $p < 0.05$ (ANOVA).

Table-5: Effect of treatment with tenofovir and rifampicin on kidney malondialdehyde of male albino rats

observed in animals treated with individual doses of tenofovir and rifampicin. These effects on oxidative stress markers were not synergistic in animals co-treated with tenofovir and rifampicin. Considering observations in this study co-treatment with tenofovir-rifampicin in human immunodeficiency virus and tuberculosis co-infection may not be associated with synergistic oxidative kidney damage.

In this study, observed time-dependent decreases in superoxide dismutase, glutathione, catalase, glutathione peroxidase and glutathione transferase with increase in malondialdehyde level in tenofovir treated animals is a sign of oxidative kidney damage. This is consistent with the work of Adaramoye and colleagues who reported increase in malondialdehyde level and decreases in antioxidants in animals treated with 50mg/kg/day of tenofovir for 4 weeks.²² Also, time-dependent increases in malondialdehyde levels with decreases in superoxide dismutase, catalase, glutathione, and glutathione transferase levels observed in rifampicin treated animals suggest signs of oxidative kidney damage.²²

Malondialdehyde is the major oxidative product of the peroxidation of polyunsaturated fatty acids by oxidative radicals.²³ This makes increase in malondialdehyde level observed in this study a sign of lipid peroxidation induced by these agents. Glutathione whose active and oxidized form is glutathione disulfide detoxifies xenobiotic and scavenges oxidative radicals; decrease in glutathione level observed in this study could stimulate accumulation of oxidative radicals leading to oxidative kidney damage.²⁴ Catalase is a cytosolic enzyme that protects biological system against oxidative radicals, and catalyzes the dismutation of superoxide anion radicals to hydrogen peroxide which is degraded into a molecule of oxygen and water. Decrease in its level could stimulate accumulation of superoxide anion radicals leading to kidney damage.²⁵ Super oxide dismutase is a vital scavenger of superoxide anions, decrease in its level could instigate superoxide accumulation which may inactivate several mitochondrial enzymes, and stimulate pro inflammatory processes.²⁶ Inactivation of superoxide dismutase could also result in the accumulation of toxic superoxide anion which could further react with nitric oxide to form peroxynitrite. Peroxynitrite is a potent nitrosating agent that can cause direct damage to proteins, lipids, and DNA. Glutathione-s-transferase catalyzes the Conjugation of xenobiotic electrophilic substances with GSH to form the corresponding GSH-S-conjugate. Glutathione reductase utilizes NADPH and maintains GSH in a reduced form.²⁷ Decreases in glutathione-s-transferase and glutathione reductase observed in this study will further expose the kidney to oxidative injury. Observed decreases in antioxidants in the kidney of animals treated with these agents may be due to oxidative stress through the generation of free radical.²⁸ This observation is supported by the fact that oxidative stress is one of the mechanisms reported to be associated with tenofovir and rifampicin induced renal toxicity.²⁹ In addition, studies suggest that rifampicin induced kidney damage is either a type II or type III hypersensitivi-

ty reaction induced by rifampicin antigens in which anti-rifampicin antibodies form immune complexes are deposited in renal vessels, glomerular endothelium, and interstitial area.³⁰

CONCLUSION

Observation in this study shows co-therapy with tenofovir-rifampicin in the management of tuberculosis and human immunodeficiency may not be associated with synergistic oxidative kidney damage.

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Epidemiology of Peptic Ulcer Disease in Rural Haryana: Retrospective Data Analysis of Last Ten Years – 800 Cases

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ABSTRACT

Background: Perforation peritonitis is one of the commonest emergencies encountered by surgeons. The aim of this paper is to provide an overview of the spectrum of perforation peritonitis and correlates of peptic perforation managed in Maharaja Agrasen Medical College, Agroha, Hisar, Haryana, which mainly caters to the rural population of Haryana, particularly Hisar and nearby districts. In the late eighteenth century, various aspects of the clinical presentations of gastric and duodenal ulcers began to be recognized and knowledge of clinico-pathological presentation and treatment added up thereafter regarding this particular disease, medical research in the laboratory and the hospital became well established as the main driver for the introduction of new treatments and investigations.

Material and methods: The present retrospective study was carried out on 800 patients who were operated for peptic perforation in last 10 years. The comparison was carried out in terms of age, sex, site of perforation, Histopathological reports.

Results: Pre-pyloric perforation was found in 498 patients (62.25%). Duodenal perforation was found in 302 patients (37.75%).

Conclusions: Patient characteristics, such as sex, age, smoking, alcohol consumption, diet, access to quacks indicate a higher Pre-pyloric perforation rate in rural Haryana.

Keywords: Dyspepsia, quacks, smoking, alcoholism, peptic perforation.

3. Acute Gastritis or Acute gastric Catarrh

4. Chronic Gastritis or Obstinate Chronic Dyspepsia

Dyspepsia may be an early symptom of a serious illness, such as peptic ulceration, cholelithiasis or gastric carcinoma, but often no organic cause is found. Nearly half the gastroenterological workload involves the management of patients in whom no organic lesion can be identified: many have dyspepsia. The majority are treated in General Practice. No agreement has yet been reached on the definition, classification or management of dyspepsia. Even the term 'dyspepsia' is not universally understood. dyspepsia defies definition.⁵ Symptoms of dyspepsia or indigestion have affected more than twenty percent of general population in developing countries and has attracted the involvement of many medical practitioners and others with the provision of health care. Within this group of symptomatic dyspeptic patients were to be found gastric and duodenal ulcers which were capable of causing serious health problems. However the prevalence of stomach and duodenal peptic ulcers has declined markedly during the time course, peptic ulcers may still have a fatal outcome, they now are considered to be curable conditions for the majority of patients who suffer from them in the developing countries. Although ulcers may be found in the oesophagus, the stomach and the duodenum, this study is concerned only with the gastric (or stomach) and duodenal ulcers. When discussing these collectively, the term 'peptic ulcers' shall be used.

The word 'peptic' is derived from the Greek 'peptein' which means 'to digest' and there is an implication by its conjunction with 'ulcer disease' that the digestive processes themselves play a part in the formation of an ulcer. Gastrointestinal perforations constitute one of the commonest surgical

INTRODUCTION

Perhaps the earliest example of death caused by a gastric ulcer was found in the 1984 post-mortem report of the exhumed body of a Chinese man who died in 167 BC.¹ A contemporary physician, Robert Squirrell, described the symptoms of indigestion as follows; 'Diminution or total loss of appetite, sometimes vomiting, especially in the morning, bad taste in the mouth, foul tongue, distension, and pain in the stomach and bowels, particularly after meals, eructations, etc.'² By the nineteenth century, 'dyspepsia' had become virtually synonymous with 'indigestion' and many books were written on the subject.³ Wilson Fox⁴, Classified the dyspeptic condition as:

1. Atonic Dyspepsia
2. Neurosis of the Stomach

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emergency encountered by surgeons.^{6,7} The etiological spectrum of perforation peritonitis in India differs significantly from its western counter parts.^{8,9,10}

MATERIAL AND METHODS

This retrospective study was carried out on data obtained from patients who underwent laparotomy for perforation peritonitis from 2004 to 2014(ten years) in our institute. 800 of these patients who were found to have peptic perforation were included in the study. Patients with concomitant perforations eg. Enteric and in one case uterine perforation with history of D and C (Dilatation & Curettage) done 6 (six) days earlier to laparotomy were not included in this study. Patients who underwent laparotomy for peptic perforation were compared in terms of demographic data including age, sex, history of smoking, alcohol consumption, diet, history of visits to quacks for conventional (desi) medication, radiological findings and histo-pathological report. All the exploratory laparotomies were performed by qualified and experienced surgeons. Midline laparotomy incision was given in all the surgeries, any collection in peritoneal cavity was suctioned out. Thorough peritoneal lavage was done using normal saline. Site of perforation was identified, biopsied and omental patch repair was performed in each of the 800 cases as closure with an omental patch is well-established as the optimal procedure.^{11,12} The peritoneal cavity was dry

mopped and a drain was inserted in peritoneal cavity through a separate stab wound in flank and was secured to skin. Fascia (sheath) was closed in midline, skin sutures applied and a sterile dressing applied.

STATISTICAL ANALYSIS

Data so obtained was analyzed using Statistical Package for Social Science (SPSS) Version-19 data analysis software. Correlates were deduced in form of Odds Ratio.

RESULTS

Out of 800 patients operated for peptic perforation 498 had Pre-Pyloric perforation (Males 396 and Females 102), 302 had duodenal perforation (Males 176 and Females 126). The mean age was found to be 38.7 years. Out of the 176 males in Duodenal Perforation group, Smoker: 126, Alcoholic: 76 out of 126 smokers, Smoker and Alcoholic: 76, Visited Quacks: 49, Dyspepsia: 99. Out of the 126 females in Duodenal perforation group Smoker: 71, Alcoholic: 1 out of 71 smokers, Smoker and Alcoholic: zero, Visited Quacks: 31, Dyspepsia: 72. Out of the 396 males in Pre-Pyloric Perforation group, Smoker: 331, Alcoholic: 306 out of 331, smokers and Alcoholic: 306, Visited Quacks: 349, Dyspepsia: 357. Out of the 102 females in Pre-Pyloric Perforation group, Smoker:

Year	Age in Years & Sex distribution						DP	PP
	15-20	21-30	31-40	41-50	51-60	61 & above		
2004	M - 0 F - 1	M - 2 F - 2	M - 23 F - 8	M - 17 F - 6	M - 10 F - 6	M - 8 F - 2	M - 18 F - 14	M - 42 F - 11
2005	M - 2 F - 0	M - 3 F - 1	M - 19 F - 9	M - 17 F - 7	M - 9 F - 6	M - 6 F - 1	M - 17 F - 12	M - 39 F - 12
2006	M - 1 F - 1	M - 2 F - 2	M - 12 F - 8	M - 19 F - 6	M - 8 F - 5	M - 8 F - 3	M - 15 F - 14	M - 35 F - 11
2007	M - 0 F - 0	M - 1 F - 1	M - 14 F - 10	M - 17 F - 6	M - 12 F - 7	M - 10 F - 2	M - 18 F - 14	M - 36 F - 12
2008	M - 3 F - 0	M - 3 F - 1	M - 15 F - 7	M - 18 F - 4	M - 10 F - 4	M - 4 F - 3	M - 16 F - 11	M - 37 F - 8
2009	M - 0 F - 0	M - 5 F - 0	M - 19 F - 8	M - 14 F - 5	M - 10 F - 3	M - 8 F - 1	M - 17 F - 10	M - 39 F - 7
2010	M - 0 F - 0	M - 2 F - 0	M - 20 F - 10	M - 15 F - 7	M - 10 F - 3	M - 1 F - 1	M - 15 F - 11	M - 33 F - 10
2011	M - 0 F - 0	M - 6 F - 1	M - 15 F - 6	M - 15 F - 7	M - 11 F - 3	M - 5 F - 1	M - 16 F - 10	M - 36 F - 8
2012	M - 1 F - 0	M - 1 F - 0	M - 19 F - 9	M - 16 F - 5	M - 9 F - 6	M - 6 F - 1	M - 16 F - 12	M - 36 F - 9
2013	M - 0 F - 1	M - 1 F - 0	M - 16 F - 8	M - 14 F - 4	M - 7 F - 3	M - 5 F - 1	M - 13 F - 10	M - 30 F - 7
2014	M - 1 F - 0	M - 1 F - 0	M - 17 F - 5	M - 19 F - 6	M - 9 F - 3	M - 1 F - 1	M - 15 F - 8	M - 33 F - 7
Total	M - 8 F - 3	M - 27 F - 8	M - 189 F - 88	M - 181 F - 63	M - 105 F - 49	M - 62 F - 17	M - 176 F - 126	M - 396 F - 102
Grand Total	M + F = 11	M + F = 35	M + F = 277	M + F = 244	M + F = 154	M + F = 79	M + F = 302	M + F = 498

Table-1: Sex wise Distribution of total visited patients

77, Alcoholic: 3 out of 77 smokers, Smoker and Alcoholic: 3, Visited Quacks: 94, Dyspepsia: 93. In the smoker group: Risk of developing Pre-Pyloric perforation by smoking was found to be 2.4 times higher than the risk of developing Duodenal perforation. In the alcoholic group: Risk of developing Pre-Pyloric perforation by alcohol consumption was found to be 4.7 times higher than the risk of developing Duodenal perforation. In the group where treatment was taken from Quacks: Risk of developing Pre-Pyloric perforation by treatment from Quacks was found to be 6.1 times higher than the risk of developing Duodenal perforation.

DISCUSSION

One of the most common surgical emergencies is perforation peritonitis¹³ It is commonly seen in a younger age group in the tropical countries.¹⁴⁻¹⁶ Commonly the perforations involve the proximal part of the gastrointestinal tract, this being in contrast to studies from the western countries, where perforations are common in the distal part.¹⁷⁻¹⁹ Smoking and alcoholism are rampant in Haryana²⁰ more so in Rural areas. Treatment by Quacks has an attribute to the increased risk of developing Pre-Pyloric perforation because even patients do not know what drug was given to them. Quacks supposedly administer Glucocorticoids (Steroids) in order to relieve the symptoms of pain and dyspepsia without knowing the consequences of these drugs. Indiscriminate use of over the counter sold painkillers has also contributed to the overall outcome.

CONCLUSION

Male sex, alcoholism, smoking and treatment of symptoms of dyspepsia by Quacks clearly indicate that risk of developing Pre-Pyloric perforation is significantly higher than risk of developing Duodenal perforation.

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Surgical Management of Cataract in Pseudoexfoliation

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ABSTRACT

Introduction: Cataract surgery may be more hazardous in pseudoexfoliation (PEX) due to combination of poorly dilating pupil, increased risk of zonular dialysis and vitreous loss. Postoperatively these patients require frequent follow up to monitor for complications like raised intraocular pressure, inflammation and Intra ocular lens dislocation. Aim was to study the outcome of cataract surgery in pseudoexfoliation eyes.

Material and Methods: In the current prospective, cross sectional, cost effective and out come study, 45 eyes of cataract with pseudoexfoliation of 45 target patients attending to the tertiary centre were included. Surgical procedure followed is Manual Small Incision Cataract Surgery. Adrenaline (preservative free, 0.5mg to 500 ml of infusion) has been used to get needed mydriasis during surgery. Various pre operative, intraoperative and Postoperative complications along with postoperative Best Corrected Visual Acuity and lens position are evaluated periodically from day 1 to 6 months. Exclusion Criteria: Eyes having obvious corneal pathology and obvious posterior segment pathology are excluded.

Results: 3:2 (M:F) is the gender ratio. Poor pupillary dilatation and Nuclear sclerosis are the common associations observed among cataract eyes with PEX. There is 1 case (2%) of Phacodonesis. P.C IOL could be implanted in 44 (97.7%) cases and their visual out come is between 6/12 to 6/6. Sulcus fixated IOL is kept in one case (2.2%) but with poor visual out come. Round Pupil could be achieved in 43 (95.5%) cases. Pupil is irregular in two (4.4%) cases due to sphincterotomy. Five (11.1%) cases developed PCO within 6 months of follow up and are managed by Nd YAG capsulotomy (vide table No.4)

Conclusion: The out come is good with Manual Small Incision Cataract Surgery with intraoperative preservative free adrenaline added to infusion bottle in eyes with pseudoexfoliation, risk of vision threatening problems can be minimised and it may be an option for surgical management of cataract in Pseudoexfoliation eyes. Our method does not appear to detract from the surgical out come

Keywords: out come, small pupil, preservative free, viscoelastics, hazardous.

INTRODUCTION

Pseudoexfoliation known by a variety of other names as senile exfoliation, exfoliation syndrome, senile uveal exfoliation, etc occurs when there is abnormal relationship between Matrix Metallo Proteinases and Tissue Metallo Proteinases

that leads to development and precipitation of exfoliative material.¹ It is first described by Lindberg in 1917.² He believed that this material is created by earlier inflammation. The material has multifocal origin hence seen in various ocular structures. In addition to its occurrence in the eye the exfoliative fibrilopathy has been reported in skin and visceral organs suggesting that PEX is an ocular manifestation of systemic disease. It is best seen in undilated eye by seeing dandruff like deposits at pupillary margin. Peri pupillary transillumination defects are common. The classic presentation of central translucent disc surrounded by clear zone which in turn surrounded by grey white ring with scalloped edges on lens surface may not be visible in all cases due to poorly dilating nature of pupil. A polymorphism in exon 1 of the LOXL1 gene³ which is associated with extracellular matrix formation has been found to be highly associated with exfoliation.

Prevalence is closely linked with age reaching a maximum in 7th-9th decade. A study carried out in South India reported prevalence of PEX as 3.8%, while the Andhra Pradesh Eye Disease Study reported it as 3.01%^{4,5} Prevalence of glaucoma is variable in these eyes.

Well-dilated pupil with a sharp red reflex enhances the ease of cataract extraction and decreases the likelihood of complications like iris sphincter tear, zonular disruption, posterior capsule rent, vitreous prolapse and lens in vitreous in exfoliation eyes. Poor pupillary dilatation, zonular weakness, hard cataract and glaucoma are the common problems in pseudoexfoliation eyes, which alter surgical out come when attention is not paid to them. Small pupil⁶ that can impede visualization and make instrumentation into the eye more difficult. An intumescent or a brunescient cataract will cause anterior chamber shallow. It is difficult to prolapse and also express the hard nucleus.

The study object is to identify pre operative complications in PEX eyes by proper evaluation there by assessing possible intraoperative complications, and planning for preventive

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measures which ensures best visual outcome. The surgeons plan requires flexibility and resourcefulness.

The underlying pathophysiology should be taken into consideration when strategizing the surgical plan. The ultimate goal of surgery is to replace cataract with IOL for best visual outcome.

MATERIALS AND METHODS

This prospective, cross sectional, cost effective and outcome study comprises 45 eyes of 45 patients having cataract with PEX as basic pathology presenting over a period of 1 year (August 2014 to June 2015) underwent lens removal and subsequent intraocular lens implantation performed by single surgeon in ophthalmology department of a tertiary hospital. The study was approved by Institutional Ethical Committee Board. Written and informed consent is obtained from all the patients regarding eye condition, surgical procedure and surgical risk.

PEX diagnosed clinically by the presence of typical material at the pupillary border on undilated examination, on anterior lens surface on dilated examination, on trabecular meshwork on gonioscopy, pigment deposition in angle and on corneal endothelium.

Pre operative examination

Detailed clinical history is obtained and complete ophthalmological examination is done for every patient. Clinical data of patient age, gender, presenting complaints are recorded. Relevant history such as family history of ocular and systemic diseases are noted.

In all patients Best Corrected Visual Acuity is assessed by age appropriate charts. Visual Acuity ranged from CF 1-4 Mts. All cases are evaluated by Slit Lamp examination, IOP measurement, Pupillary Reaction, Gonioscopy, Fundus examination, B-Scan & A Scan Biometry, Keratometry proper management of systemic diseases like Diabetes, Hypertension, and Asthma by the concerned specialists. 3:2 (M:F) is the gender ratio. Age group selected in the study are above 40 years. Patients with pseudoexfoliation material on the anterior lens surface at and or pupillary margin in either or both eyes were labelled as having PEX.

All patients are from poor socio economic status and their basic education qualification ranged from uneducated to below 10th standard.

Slit Lamp examination

Four out of 45 corneas have pigment deposition on Endothelium. Anterior Chamber Depth is normal, except in 2 cases, shallow AC where cataract is brunescence type. There is change of iris pattern which is thick & hyperpigmented in all cases. Trans illumination pupillary defects are seen in 3 cases. Pseudoexfoliation of pupillary margin is seen in 39 cases (Table No 2) with normal Direct and Consensual light reflex action. Poor pupillary dilatation is seen in 35 cases.

Age group	No. of patients	Percentage
40 to 49 years	5	11.1%
50 to 59 years	16	35.5%
More than 60 years	24	53.3%

Table-1: Age group

Pupil size	No. of cases	Percentage
Below normal size pupil	36	80%
Normal sized pupil	10	20%
shallow ac	2	4.4%
Corneas having pigment deposition on endothelium	4	8.8%
Cataract grading cortical	10	22.2%
Nuclear: Grade I to II	12	77.7%
Grade III to IV	23	
Pupil defects	3	6.6%
Exfoliation Pupillary Margin on Lens Surface	39	86.6%
gonioscopically revealed cases	4	8.8%
Phacodonesis	2	4.4%
	1	2.2%

Table-2: Preoperative data

Lens - Exfoliative material on lens surface is observed in 4 cases. Cataract is graded by lens opacity classification system. Posterior sub capsular cataract along with cortical and nuclear cataract is in 9 out of 45 cases. Nuclear sclerosis is predominantly associated with PEX in 35(77.7%) eyes. Phacodonesis is observed in one case.

Gonioscopy revealed excess trabecular pigmentation. Two eyes having pseudoexfoliation are diagnosed gonioscopically. IOP with applanation tonometer is in normal range of 16-18 mm of Hg in all cases. Fundus is within normal limits. B-Scan performed is normal in all the cases. Dilation of pupil is measured after mydriatic drops and graded as poor (2-4mm), moderate (5-6mm) and good (>7mm).

Pre-operative preparation

Topical Antibiotic & Anti inflammatory eye drops along with systemic antibiotics are started from day before surgery. IOP kept under normal levels with oral Acetazolamide 250 mg night & 2 hours before surgery. Peribulbar block with the infiltration of Xylocaine 2% combined with Bupivacaine 0.5% Adrenaline 1 in 2,00,000 and hyaluronidase for local analgesia is achieved.

Incision and surgical strategies

The surgical procedure is Manual Small Incision Cataract Surgery by means of tunnel construction and is characterised by its greater radial length and an entry into AC to create self sealing internal corneal valve. 6 to 7 mm in cortical and Grade I & II nuclear cataracts and >7mm in Grade-III and above, tunnel is created. Intra operative mydriasis is maintained by adding Adrenaline 0.5CC (preservative free 1mg in 1ml ampoule) to infusion bottle. Shallow AC is managed

by decreasing posterior segment volume by hyper osmotics and increasing anterior segment volume by visco elastics. Side port is given for rigid pupils with poor pupillary dilation for manoeuvres like cortical aspiration, IOL dialing. Gentle (6 mm) continuous curvilinear capsulotomy(CCC) is given using needle cystitome.

To prevent stress on zonules while manoeuvring nucleus and while aspirating cortical matter, radial cuts are given to capsular margin when there is large nucleus (>10mm) with inadequate capsulorrhexis due to small pupil size (<3mm) to prolapse nucleus. Under visco, nucleus is delivered after controlled Hydrodissection. The procedures of capsulorrhexis, hydrodissection, nucleus expression into AC, its removal from AC with visco, cortical cleanup and IOL insertion are carried out in the same manner in all the cases by the same surgeon having more than 10 yrs experience. Additional care is taken to prevent stress on zonules by avoiding fluctuations in anterior chamber pressure by controlled paracentesis, profuse use of viscoelastics and by gentle nucleus manoeuvres. Large nucleus with phacodonesis is managed by avoiding stress on zonules, with adequate capsulorrhexis size and by giving radial cuts to capsular rim.

Postoperatively patients are treated with topical antibiotics and steroids tapered over 4 - 6 weeks. Patients are followed from day 1, 2, 7, 14, at 2 weeks intervals for 2 months and at monthly intervals for 6 months to evaluate corneal status, inflammation, lens position, intra ocular pressure and visual acuity. The data is entered and analysed using MS-Excel.

RESULTS

In the present study forty five eyes having cataract with pseudoexfoliation of 45 patients who underwent cataract surgery by Manual SICS are included to evaluate various preoperative, intraoperative, and postoperative complications.

Age group of patients is above 40 years. Among 45 patients 40 (88.8%) patients are above fifty years age group. There is a male preponderance of 27 out of 45 patients.

Preoperatively 80%(36 eyes) produced 6mm and 20%(9 eyes) produced <6mm pupillary dilatation. Pupil equal to or less than 6 mm is considered as abnormal after mydriatic instillation. Eyes diagnosed as PEX by having exfoliative material at pupillary margin are 39(86.6%), on lens surface are 4(8.8%) and gonioscopically revealed cases are 2(4.4%). Pigment dispersion on endothelium is seen in 4(8.8%) cases. Nuclear sclerosis is seen in 35 (77.7%) of cases and cortical cataract is present in 10 (22.2%) cases. IOP ranged from 16 - 18 mm Hg. Shallow anterior chamber is seen in 2 (4.4%) cases because of intumescent cataract. There is one case (2.2%) of phacodonesis. In most of the case excess pigmentation over trabecular meshwork is seen (Table 1).

Intraoperative difficulties

All patients underwent cataract surgery using Manual SICS technique. Difficulty faced in 15(33.3%) cases while pro-

lapsing nucleus because of its hardness and greater size (L.S.of grade-III and above) and pupil size is <5mm. Mechanical dilatation of pupil is required before capsulotomy. Radial cuts are given to capsular rim at 1,5 & 10 clock hours in 4 (8.8%) cases of Grade IV nuclear cataract to prolapse nucleus. 2 (4.4%) cases required Sphincterotomy due to rigid and <5mm size of pupil with Grade-IV cataract. One case required multiple sphincterotomies.

Nucleus Delivery

2 (4.4%) cases required tunnel conversion where in spite of capsulotomy & big tunnel, nucleus delivery is difficult. Conversion is done to prevent endothelial damage. Nuclear break-up occurred in 2(4.4%) cases. While attempting to remove the second piece, adequate visco is used to disengage and to remove the broken piece.

Aspiration of Lens Matter

In spite of poor pupillary dilatation and cortico capsular adhesion, thorough cortical clean up especially subincisional cortex is done without any left over lens matter by means of sustained maintenance of pupil dilatation and anterior chamber depth and giving radial cuts to capsular margin at subincisional area. In 1 (2.2%) case where there is difficulty of subincisional cortex aspiration, which lead to Zonular disruption of less than 3 clock hours. The case is managed by adequate visco, meticulously clearing vitreous. In 44 (97.7%) cases PC IOL could be inserted. In one case (2.2%) IOL is placed in sulcus due to zonular disruption. Three (6.6%) cases required suturing with 10-0 nylon for tunnel closure. (Table-2)

Post operative complications

One case (2.2%) of Striate Keratopathy of Gr III is noted, due to nucleus maneuver. The expected post operative complications like inflammation, raised IOP and pupillary block are nil at 6months follow up. Round pupil could be achieved in 43 (95.5%) cases and irregular pupil is noted in 2 (4.4%) of cases due to sphincterotomy. In spite of adequate intraoperative precautions, the eye with phacodonesis has decentration of IOL, observed at 6 months follow up due to zonular weakness. 6/12 to 6/6 of visual acuity could be achieved in 44 (97.7%) cases. The visual acuity is less than 6/60 in decentered IOL which is considered as poor visual outcome. 5 (11.1%) of cases developed PCO within 6 months of follow up and are managed by Nd YAG capsulotomy (vide table No.4).

DISCUSSION

Cataract surgery in patients with pseudoexfoliation is a risk not only to the patient but to the surgeon also.⁷ Majority of patients in our study are above age of 60 years (53.3%). Epidemiological studies of PEX have shown that it is more common in patients older than 60 yrs and prevalence further in-

Difficulties	No. of patients	%
Nucleus prolapse	15	33.3%
Sphincterotomy	2	4.4%
Cortical clean up	5	11.1%
Zonular disruption leading to sulcus fixated IOL	1	2.2%
suturing required	3	6.6%
Tunnel conversion	2	4.4%

Table-3: Intra operative difficulties

Observations	No. of patients	%
SK	1	2.2%
Irregular pupil	2	4.4%
IOL in position	44	97.7%
PCO	5	11.1%
VA 6/12 to6/6	44	97.7%

Table-4: Post operative observations

creases with age.⁸ Among 45 patients 27(60%) are males and 18(40%) are females with a male:female ratio of 3:2. Reports regarding sex predilection in PEX are conflicting. External environmental factors have also been implicated for causing PEX. Avrademis, Sakkias and Traindis reported a female preponderance.⁹

The signs of zonular instability such as iridodonesis, phacodonesis and lens subluxation should be carefully looked for under slit lamp preoperatively before and after dilation of the pupil.¹⁰

In the present study poor pupillary dilation and hard cataract are the common hazards observed. Among 45 patients, hard cataract is seen in 35(77.7%). Most studies have found a strong association between PEX and nuclear cataract.^{11,12} As prevalence of glaucoma is variable in PEX, there is no incidence of glaucoma capsulare in our study.

In the present study small and rigid pupil is the most common intra operative problem which is managed by bimanual stretching, and intra operative mydriasis is maintained by preservative free adrenaline added to infusion bottle. There are other mechanical methods and devices to enlarge the pupil at cataract surgery, manage zonular disruption which include, stretch pupiloplasty by means of Kuglens hook to retract the iris tissue through four or more corneal stab incisions, or introducing mechanical stretching devices to pull on the sphincter margin, Malyugin rings, Capsular tension rings for zonular weakness.^{13,14} All of these methods are cumbersome, require specialized instruments, difficult intraocular manoeuvres, and are associated with bleeding, permanent loss of iris sphincter function, and abnormal pupil shape postoperatively.

Poor zonular integrity may affect cataract surgery technique and IOL implantation. Meticulous gentle capsulotomy prevents force on the zonules. Radial incisions are to be given to capsular rim when there is abnormal ratio between pupil and nucleus size which will ease nuclear prolapse. Also unlike in

other cataracts, the rhexis should be more than 6.5mm but at the same time should not extend upto zonules. This will reduce the amount of anterior capsular epithelial cells, which in turn will reduce the post operative capsular fibrosis.

Reducing the size of nucleus by hydrodelimitation is a difficult task in nuclear cataracts of grade IV. In these cases due to lack of strong zonules, there is intraoperative chance of zonular rupture, and nucleus drop and shrinkage of the rhexis postoperatively. Hydroprocedure should be done very carefully to prevent zonular stress. As peripheral iridocapsular adhesions are common in pseudoexfoliation eyes, aspiration of cortex is difficult and is the most important threat to cause zonular weakening.

Adequate use of OVD maintains anterior chamber depth, pupil dilatation, prevents stress on zonules and endothelial damage as pseudoexfoliation eyes have compromised endothelium.

Pseudoexfoliation eyes have a tendency for post operative iritis. Incomplete removal of cortical matter due to poor visibility secondary to poor pupillary dilatation may lead to post operative inflammation, and capsular opacification. In our study though no obvious postoperative lens matter is detected, it could be the cause for development of PCO in 5 (11.1%) of our cases. Due to meticulous intraoperative care the inflammation that occurred postoperatively in low grade, responded well with topical steroids and cycloplegics. Studies have reported that IOL decentration is primarily due to decentration of entire bag.¹⁵⁻¹⁶ The IOL decentration that occurred in our study is due to intraoperative zonular disruption. Present methods of managing cataract in pseudoexfoliation eyes by means of SICS have all had limitations. Phacoemulsification technique can not be employed as the standard procedure due to certain reasons. Moreover endothelial cell loss in Phaco depends on density of nucleus. In Manual SICS the skill of the surgeon plays an important role. Manual SICS with intra operative usage of Adrenaline to infusion bottle limits complications, prevents usage of strong mydriatics such as 10% phenylephrine often associated with untoward ocular and systemic side effects. Ignoring pupil size, zonular integrity, hardness of cataractous lens and performing the manoeuvres of small incision surgery through an un-enlarged incision, may result in inadvertent complications like zonular dialysis, iridodialysis, bleeding, increased risk of posterior capsule tear and nucleus drop.

Though the modern techniques and mechanical devices can increase the margin of safety, they are cost effective and can not be employed as standard procedures.

CONCLUSION

Manual SICS is a good alternative to phacoemulsification in countries where very high volume surgery with inexpensive instrument is required. It can be performed on dense cataract having poor pupillary dilatation due to PEX. The procedure has a low rate of complications. Successful surgical

outcomes may be achieved in eyes having cataract and PEX, with associated poor pupillary dilatation and zonular weakness with both mechanical iris dilation and iris retention devices as well as capsular tension rings. The retention devices add to overall surgical cost and generally require more time in the O.R than a mechanical pupillary stretch. Pupillary stretch is more traumatic to the iris and also possibly to the corneal endothelium, but our management method does not appear to detract from the surgical outcome. Besides managing and handling the small pupil, the other precautions like good and wide rhexis, careful Hydroprocedure, very watchful cortical aspiration and in difficult cases implanting IOL and then attempting for cortical removal all are important steps to manage cataract in PEX eyes successfully.

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A Surgical Experience of Managing Abdominal Tuberculosis – What's New

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ABSTRACT

Introduction: Abdominal Tuberculosis in all its grandeur still rules the roost in third world countries like ours. The main objective of this study was to identify the changes that may have occurred over time in the presentation and treatment of this disease.

Material and method: This was a prospective study on 40 patients admitted from October 2014 to September 2015 in the surgery wards of our institution. Only those patients in whom abdominal tuberculosis was confirmed by imaging or histopathology were included in this study. A meticulous record of the demography, presentation, investigations and treatment was maintained in a previously prepared proforma for this purpose. All relevant data was analyzed using SPSS software version 17.

Results: 24(60%) patients were males and 16(40%) were females with ages ranging from 11-60 years. All patients belonged to a low socioeconomic group. 14(35%) patients presented in the emergency as complete intestinal obstruction, six(15%) had incomplete bowel obstruction and four(10%) presented with bowel perforation, all diagnosed on plain x-ray abdomen. The rest 16(40%) patients were diagnosed on abdominal ultrasonographic findings of ascites, ileocaecal mass /abscess, thickened terminal ileum. Only eight(20%) required CECT for further clarification. 12(30%) of all patients were treated conservatively. Adhesiolysis in eight(20%) was the commonest surgical procedure performed.

Conclusion: Abdominal tuberculosis in our region should always be considered in patients presenting with small bowel obstruction, or chronic ascites of unknown etiology. Anti-tubercular treatment 2 (HRZE) /4(HR) for a minimum of 6 months is all that is required in most patients.

Keywords: abdominal tuberculosis, diagnosis, management

carried out to review the clinical spectrum of the disease, diagnostic dilemmas and surgical treatment of the same in our economically deprived region.

MATERIAL AND METHODS

This prospective study on Abdominal Tuberculosis was conducted from October 2014 to September 2015. A total of 40 patients with proven abdominal tuberculosis were included in this study. All patients were evaluated with a meticulously taken history and thorough physical examination. Investigations included a complete blood count (Hb, TLC, DLC), ESR, LFTs, Mantoux test, Chest X-ray PA view, Abdominal x-ray AP view and abdominal ultrasonography. Laparoscopy, ascitic fluid examination and Computed tomography were carried out in selected patients as per requirement. In cases where a tissue specimen was available, a definitive histo-pathological lesion characteristic of tuberculosis (presence of epithelioid granuloma, caseation, Langhan's giant cells) in the diseased abdominal segment or in the draining lymph nodes was taken as confirmatory evidence of the disease. All patients were put on anti-tubercular therapy 2 (HRZE) /4(HR) for a minimum of 6 months as part of conservative treatment or soon after surgery. All patients are on follow-up and will remain so for at least one year following completion of therapy.

Exclusion Criteria: Genitourinary Tuberculosis.

Ethical consideration: Due permission was taken from the hospital ethical committee to carry out this study.

RESULTS

Out of 40 patients included in this study, 24(60%) were males and 16(40%) were females with ages ranging from 11-60

INTRODUCTION

Abdominal Tuberculosis by definition includes the involvement of the gastrointestinal tract, peritoneum, the mesentery and its nodes. Solid viscera, liver, including spleen and pancreas, can also be rarely involved.¹ 11-16% of all cases of tuberculosis are extrapulmonary of which 3-4% are abdominal tuberculosis.² Primary tuberculosis of intestine without antecedent or associated pulmonary tuberculosis is also fairly common.³ Both the incidence and severity of abdominal tuberculosis are expected to increase with the increasing incidence of HIV infection in India.⁴ The present study was

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years. (Figure 1). All patients belonged to a low socioeconomic group, with an average family income of Rs2000/-per month. The commonest presentation was of pain in the abdomen 26(65%) and abdominal distension 20(50%). Only 6(15%) patients had an abdominal lump (Table 1). In the emergency, complete small bowel obstruction was seen in 14(35%) patients. Other emergency presentations were incomplete bowel obstruction in six(15%) and ileal perforation at or above a complete stricture in four(10%) patients (Figure 2). Six (15%) patients were anaemic with hemoglobin below 8gm% and eight(20%) had a raised ESR. Ascitic fluid analysis revealing a high lymphocyte count and adenosine deaminase above 36IU/L was diagnostic in four(10%) patients. Radiological findings on a chest X-ray revealed associated pulmonary tuberculosis in 2(5%) patients. Intestinal obstruction and perforation was diagnosed on a plain X-ray abdomen. Abdominal ultrasonography findings of ascites, ileocaecal mass/abscess, thickened terminal ileum were used to diagnose 16(40%) patients. CECT was required in eight (20%) patients to clarify diagnostic dilemmas. Ileo-ileal intussusception in one patient, cholelithiasis in 8(20%) and splenic abscess in one patient were other incidental findings. 12(30%) of all patients were treated conservatively. Adhesiolysis in eight(20%) was the commonest surgical procedure performed. Six (15%) required drainage of an intra-abdominal abscess. Ileostomy exteriorization of the perforations in four (10%) and primary resection anastomosis for strictures in the terminal ileum in four (10%) patients were the other common procedures performed. Six (15%) patients underwent diagnostic laparoscopy with peritoneal, mesenteric lymph node or omental biopsy (Figure 3). 24cm of the terminal ileum and the ileocaecal junction was the only area involved in our study. 10(25%) patients were diagnosed on histopathological findings of epithelioid granuloma, caseation, Langhan’s giant cells in mesenteric lymph nodes peritoneal and intestinal biopsy. Wound infection in 12(30%) patients was the commonest postoperative complication. Two (5%) patients developed incisional hernias. No patient was HIV positive. The average hospital stay was 15 days. There was no mortality in this series. All patients were put on anti-tubercular therapy 2 (HRZE) /4(HR) for a minimum of 6 months and will remain on follow-up for a minimum of one year.

Symptoms and Signs	Number of patients	%
Pain In Abdomen	26	65
Abdominal Distension	20	50
Vomiting	18	45
Constipation	14	35
Fever	6	15
Abdominal Lump	6	15
Ascites	4	10
Loss of Appetite	4	10

Table-1: Symptoms and signs of abdominal tuberculosis (N=40)

DISCUSSION

Abdominal tuberculosis is the sixth commonest extra pulmonary site for the disease.⁵ Abdominal tuberculosis can occur at any age and the mean age of 35 years in the present study reflects the observations of another study from Pakistan where the mean age was 28.21 ± 5.75 years.⁶ Majority of patients in our study belonged to a poor socio-economic class. Poor nutritional status, lack of health facilities and poor pasteurization of milk are contributors to this problem.⁷ Abdominal pain was the commonest presentation in our patients (65%) as has been recorded by others.⁸ Intestinal obstruction seen in 20(50%) patients was the commonest cause for which the patient presented in the emergency a finding

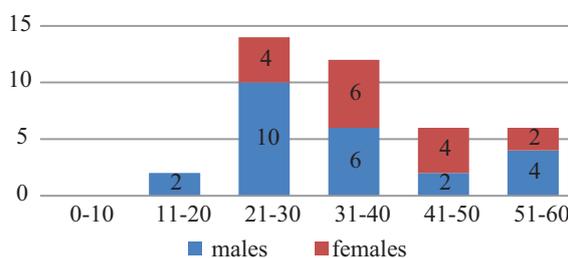


Figure-1: Age and Sex distribution in abdominal tuberculosis

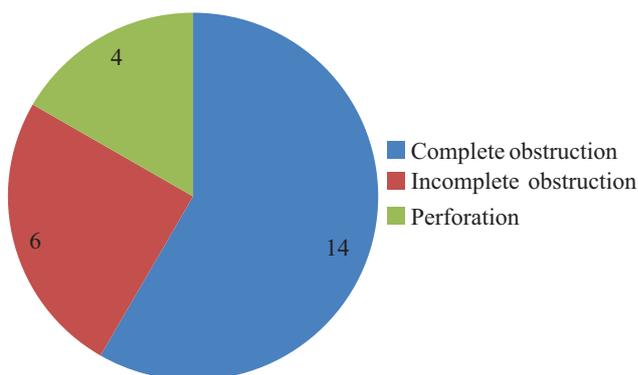


Figure-2: Presentations in the emergency

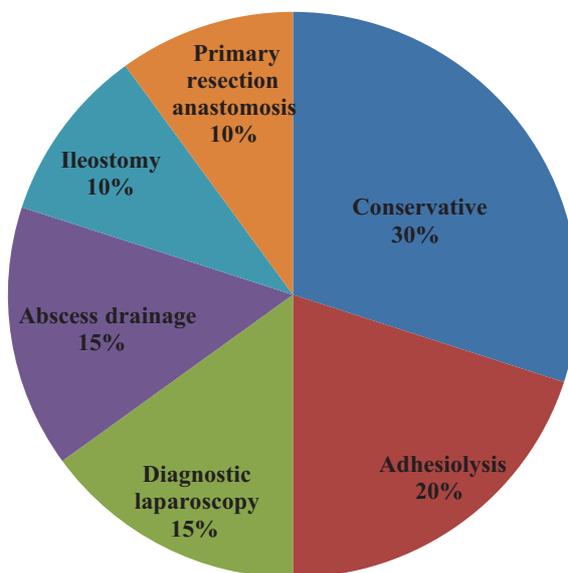


Figure-3: Treatment and Procedures for Abdominal Tuberculosis

corroborated in other studies.⁹ This is in sharp contrast to that reported in the western literature where abdominal tuberculosis as a cause of mechanical obstruction is very rare.¹⁰ Ileal perforations usually occur at or proximal to a stricture the same seen in our patients.¹¹ The terminal ileum and ileocaecal regions were the only areas involved in our study and is in contrast to other studies where other areas of the gut albeit rarely were also involved.¹² Pulmonary tuberculosis was an associated finding in only two(5%) of our patients and only one was sputum AFB positive. An Indian study had 34.78% associated pulmonary tuberculosis.¹³ Ultrasonography was used to diagnose 16(40%) of our patients whereas only 4% were diagnosed on ultrasound imaging in another study from Pakistan.¹⁴ Adhesiolysis in eight(20%) was the commonest surgical procedure performed. Intrabdominal abscess drainage in six(15%), ileostomy exteriorization of the perforations in four (10%) and primary resection anastomosis for strictures in the terminal ileum in four (10%) patients were the other common procedures performed. Ileostomy was the commonest procedure in a study from Pakistan.¹⁵ All patients were put on anti-tubercular therapy 2 (HRZE) /4(HR) for a minimum of 6 months which is the current recommendation.¹⁶ No patient had associated HIV infection which does not confirm to other studies.¹⁷

CONCLUSION

Abdominal tuberculosis should always be considered in the differential diagnosis of patients with altered bowel habits, small bowel obstruction and ascites of unknown origin in our region. Tubercular adhesions are the commonest cause of small bowel obstruction in the emergency. Exteriorization of the perforation may be safer in the setting of faecal peritonitis. A six month regime of 2(HRZE)/4(HR) is the current recommendation for antitubercular treatment of abdominal tuberculosis.

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To Study The Effect of Gestational Weight Gain on Labour and Fetal Outcome

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ABSTRACT

Introduction: High prevalence of low birth weight, high morbidity and mortality in children and poor maternal nutrition of mother continues to be major concerns in India. Research was planned to study the effect of gestational weight gain on labour and fetal outcome.

Materials and Methods: The research design was non-experimental descriptive design and was conducted from Dec 2014 to Jan 2015 in Maternity Ward of Guru Gobind Singh Medical College and Hospital, Faridkot. 100 pregnant women were selected. The demographic data was collected by interviews. The labour and fetal outcome was assessed by attending the labour.

Results: The result revealed that most of the study subjects had low gestational weight gain. The gestational weight gain is significantly associated with mode of delivery, duration of labour, birth weight of newborn and gestational age, BMI of women at the time of booking. The low weight gain study subjects had higher incidence of prolonged labour and other modes of delivery caesarean section and instrumental delivery as compared to normal gestational weight gain. The lower weight gain as well as normal weight gain subjects had similar gestational age, Apgar score, fetal complications and labour complications.

Conclusion: Gestational weight gain is significantly associated with labour and fetal outcome.

Keywords: Gestational weight gain, labour outcome, fetal outcome, Body Mass Index (BMI)

INTRODUCTION

The period of intrauterine growth and development is one of the most vulnerable period in the human life cycle. The weight of the infant at birth is a powerful predictor of infant growth and survival and is dependent on maternal health and nutrition during pregnancy.¹

"Good pregnancy outcomes are associated with healthy weight of the mother", said Kathleen Rasmussen, a Professor of nutrition at Cornell University in Ithaca, New York and chair of guidelines committee. A good diet cannot guarantee a good pregnancy outcome, but it certainly makes an important contribution.²

There is a need for behavioral intervention to advise pregnant woman on recommended ranges of gestational weight gain and promote healthy diet and regular physical activity to prevent subsequent obesity and associated health problems.³

Inadequate prenatal weight gain is a significant risk factor for intrauterine growth restriction, preterm delivery and low birth weight among infants. Obesity and excessive weight gain on the other hand can lead to adverse maternal and fetal outcomes. These have led to suggestions for optimal weight gain to ensure best outcomes.⁴

A prospective cross-sectional study was conducted to show effect of gestational weight gain on the pregnancy outcome in North West Iran. Abnormal weight gain during pregnancy was not related to an increased risk of preterm labour or cesarean delivery but was highly associated with low birth weight ($p < 0.05$).⁵

Inadequate gestational weight gain is a risk factor for low birth, intrauterine growth restriction, preterm birth and perinatal mortality.⁶ Low pre-pregnancy BMI and low gestational weight gain can account for upto 25% of cases of fetal growth restriction.⁷ The institution of medicine (IOM) recommended weight gain ranges with the primary goal of improving infant birth weight.⁸

REVIEW OF LITERATURE

Haugen M et al showed that a weight gain less than the IOM recommended increased the risk for a low birth weight baby among normal weight nulliparous women. A gestational weight gain more than that recommended by IOM significantly increased the risk of pregnancy induced hypertension, high birth weight baby, pre-eclampsia and emergency cesarean delivery in both multiparous and parouswoman.⁹

Robinson E. Mbul et al studied the effect of gestational weight gain on the outcome of labour at Yaounde Central Hospital Maternity, Cameroon, over a period of four years. Women who gained weight above the recommended range were three times. More likely to develop pre-eclampsia, had a higher incidence for induced labour and almost 4 fold in-

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creased incidence of prolonged labour. They were more likely to be delivered instrumentally, to have episiotomies and to be delivered by cesarean section.¹⁰

Choi SK, Park IY, Shin JC found that in normal weight women, maternal and neonatal complications were significantly increased with inadequate weight gain during

pregnancy.¹¹

Simar TA et al conducted a retrospective cohort study to evaluate associations between maternal BMI and risk of small for gestational age and large for gestational age neonates.¹² Bodnor LM et al conducted the study at Magee Woman's Hospital in Pittsburg, Pennsylvania. The analysis found that the combination of smoking, ethnicity, primi parity or short height with poor gestational weight gain was associated with an increased risk of short for gestational age birth, while high gestational weight gain combined with each of these characteristics diminished the risk of low for gestational age births in comparison with the same gestational weight gain amongst the women's counterparts.¹³

Addo VN conducted a retrospective study to find out the effect of pregnancy weight gain in different BMI groups on maternal and neonatal outcomes in women delivering at term. The over-weight or obese were significantly more likely to have induction of labour and more chances of cesarean compared to normal.¹⁴

Objectives of Study was to assess the gestational weight gain of antenatal women, to determine the effect of gestational weight gain on labour outcome among antenatal women, to determine the effect of gestational weight gain on fetal outcome among antenatal women and to find out the association between gestational weight gain and selected demographic variables.

MATERIALS AND METHODS

The study was conducted in Department of Obstetrics and Gynecology of Guru Gobind Singh College and Hospital, Faridkot. Total 100 antenatal women admitted for delivery were selected randomly.

Antenatal women who had pregnancy associated complications were excluded from the study. It was an interview schedule designed to collect patients socio-demographic profile and obstetrical history. Labour outcome which included duration of labour, mode of delivery and any other related complications (premature rupture of membranes, postpartum haemorrhage and perineal tear) were studied.

The fetal outcome in the form of birth weight, respiratory efforts of newborn, colour of newborn, muscle tone, reflex, irritability, heart rate, gestational age of the new born, still birth and any other related complications (meconium aspiration, birth trauma and seizure) were studied.

Variable Under Study

Gestational weight gain, labour outcome, fetal outcome, age, gravida, parity, occupation, education, family income, dietary habits, BMI at the time of booking, gestational age at the time of delivery.

Conceptual Framework

The conceptual framework for the present study is taken from Institute of Medicine (IOM) analytic frame work 1990.

Sr. No.	Content	Frequency (n)	%
1	Age of the women (in years)		
	18-23	40	40.0
	24-29	53	53.0
	30-35	5	5.0
	>35	2	2.0
2	Gravida		
	Primigravida	59	59.0
	Multigravida	41	41.0
3	Parity		
	Primipara	59	59.0
	Multipara	41	41.0
4	Educational Status		
	No formal education	3	3.00
	Primary or middle	36	36.0
	Secondary	27	27.0
	Senior Secondary	22	22.0
	Graduation and above	12	12.0
5	Occupation of the women		
	Employed	12	12.0
	Unemployed	88	88.0
6	Family income (Rs./month)		
	≤5000	20	20.0
	5001-10000	43	43.0
	10001-15000	21	21.0
	15001-20000	6	6.0
	>20000	10	10.0
7	Dietary habits		
	Vegetarian	82	82.0
	Non-vegetarian	18	18.0
8	BMI of mother at the time of booking		
	Underweight (<18.5)	51	51.0
	Normal weight (18.5-24.9)	43	43.0
	Over weight (25-29.9)	4	4.0
	Obese (>30)	2	2.0
9	Gestational weight gain of mother according to institute of medicine		
	Low weight gain	64	64.0
	Normal weight gain	36	36.0
	High Weight gain	0	0
10	Gestational age at the time of delivery (in weeks)		
	<37	24	24.0
	37-40	64	64.0
	>40	12	12.0

Table-1: Antenatal Women according to demographic characteristics (N = 100)

S. No.	Gestational weight gain	Frequency (n)	%	Mean gestational weight gain	Standard deviation
A.	Low weight gain	64	64	9.565	2.760
B.	Normal weight gain	36	36		
C.	High weight gain	0	0		

Table-2: Frequency, percentage, mean and standard deviation of gestational weight gain among antenatal women (N = 100)

Mode of delivery	Low weight gain n (%)	Normal weight gain n (%)	Total	Chi-square df p value
Normal vaginal delivery				
I. Spontaneous	17 (48.6)	18 (51.4)	35	$\chi^2 = 10.329$ df=3 p value = 0.016*
II. Induced	14 (60.9)	9 (39.1)	23	
Instrumental vaginal delivery	0 (0)	1 (100)	1	
Caesarean Delivery	33 (80.5)	8 (19.5)	41	
Total	64	36	100	

*Significant at p<0.05 level

Table-3: Association of gestational weight gain of antenatal women with mode of delivery (N = 100)

Labour Outcome	Normal weight gain	Low weight gain	Odds ratio, confidence interval p value
1. Mode of delivery			
a) Spontaneous vaginal delivery	18	17	OR = 2.765 CI = 1.173-6.514 p value = 0.020*
b) Other modes (induced vaginal delivery, instrumental delivery, caesarian delivery)	18	47	
2. Duration of labor			
a) <18	29	33	OR = 3.892 CI = 1.490-10.164 p value = 0.006*
b) 18	7	31	
3. Any labor complications			
a) Yes	3	7	OR = 1.351 CI = 0.327-5.582 p value = 0.678*NS
b) No	33	57	

*Significant at p value <0.05 level; NS: Non significant at p value <0.05 level

Table-4: Odds Ratio of gestational weight gain of antenatal women with labour outcome (N = 100)

Gestational age of the newborn (in weeks)	Low weight gain n (%)	Normal weight gain n (%)	Total	Chi-square df p value
Preterm (<37)	10 (41.7)	14 (58.3)	24	$\chi^2 = 9.465$ df=2 p value = .009**
Term (37-40)	43 (67.2)	21 (32.8)	64	
Post Term (>40)	11 (91.7)	1 (8.3)	12	
Total	64	36	100	

**Significant at p<0.05 level

Table-5: Association of gestational weight gain of antenatal women with gestational age of the newborn (in weeks)

Birth weight of baby (in kg)	Low weight gain n (%)	Normal weight gain n (%)	Total	Chi-square df p value
<2.5	39 (86.7)	6 (13.3)	45	$\chi^2 = 20.106$ df=2 p value = 0.000***
2.5-3.5	25 (47.2)	28 (52.8)	53	
>3.5	0 (0)	2(100)	2	
Total	64	36	100	

**Significant at p<0.05 level

Table-6: Association of gestational weight gain of antenatal women with birth weight of newborn (in kg) (N = 100)

RESULTS

The mean gestational weight gain among antenatal women was 9.565 kg. There was statistically significant association of gestational weight gain and mode of delivery, duration of labour, birth weight of newborn gestational age of newborn. There was statistically non significant association of gesta-

tional weight gain with complications of labour, Apgar score or fetal complications. The low birth weight gain antenatal women had higher incidence of other modes of delivery (Caesarean delivery, induced and instrumental vaginal delivery), prolonged labour as compared to normal weight gain antenatal women. The low weight gain antenatal woman had lower incidence of normal birth weight babies than normal weight

Fetal Outcome	Normal weight gain	Low weight gain	Odds ratio, confidence interval p value
Gestational age of newborn (in weeks)			
a) Term (37-40)	21	43	OR = 0.684 CI = 0.294-1.589 p value = 0.377 ^{NS}
b) Preterm post-term	15	21	
2. Birth weight (in kg)			
a) 2.5-3.5	28	25	OR = 5.460 CI = 2.149-13.873 p value = 0.001**
b) <2.5, >3.5	8	39	
3. APGAR score			
a) 7-10	35	63	OR = 0.556 CI = 0.034-9.158 p value = 0.681 ^{NS}
b) 4-6, 0-3	1	1	
4. Any other related fetal complications			
a) No	33	60	OR = 0.733 CI = 0.155-3.476 p value = 0.696 ^{NS}
b) Yes	3	4	
**Significant at p value <0.05 level; NS: Non significant at p value <0.05 level			
Table-7: Odds ratio of gestational weight gain of antenatal women with fetal outcome			

gain antenatal women. The low weight gain as well as normal as normal weight gain. Women had similar incidence of gestational age, Apgar score, fetal complications and labour complications.

Table 1 depicts the frequency and percentage distribution of sample characteristics according to socio demographic profile of ante natal women.

Table 2 shows the frequency, percentage, mean and standard deviation of gestational weight gain among antenatal mothers. The mean gestational weight gain was 9.565 kg and standard deviation 2.760. 64% of antenatal women had low weight gain, at the same time no one had high weight gain.

Table 3 shows the association of gestational weight gain of antenatal women with mode of delivery. Majority of low weight gain antenatal women had cesarean section. In normal weight gain group majority of antenatal women had spontaneous normal vaginal delivery.

The results depicted that the odds ratio of any labour complication was 1.351 (95% CI = 0.327-5.582, p value = 0.678) that was similar among both the groups.

Hence it can be concluded that other modes of delivery and prolonged labour were more among the low weight gain woman and labour complications were similar in both the groups.

From table 5 it can be concluded that the gestational weight gain of antenatal women affects the gestational age of newborn.

From table 6 it can be concluded that with the increase in gestational weight gain of antenatal women the birth weight of newborn also increased.

From table 7 it can be concluded that the low weight gain women are more likely to have low birth weight babies. The Apgar score, other fetal complications were similar among low weight gain as well as normal weight gain women.

DISCUSSION

The present study revealed that high percentage (64%) of the

antenatal women had low weight gain and 36% had normal weight gain and 36% had normal weight gain, at the same time no one had high weight gain. These findings were consistent with the study conducted by Sanka A who concluded that 60% belonged to low weight gain category and 40% belonged to normal weight gain category.¹⁵

In the present study the incidence of prolonged labour was 3.8 times more among low weight gain antenatal women. This was consistent with the study of Robinson E Mbul.¹⁰

The present study showed that the normal weight gain women were more likely to deliver normal birth weight babies such that women with low weight gain had lower incidence of normal birth weight babies. These findings were consistent with the finding by Henriksson et al.¹⁶ It is also supported by Simar TA et al.¹² Stotland NE et al showed that gestational weight gain below guidelines was associated with small for gestation age status.¹⁷

The present study showed statistically non-significant association of gestational weight gain with Apgar score. This finding was consistent with Schulz Christine M which did not support the hypothesis that insufficient or excessive weight gain would be related to lower Apgarscore.¹⁸

CONCLUSION

The findings of the study revealed that the maximum antenatal woman had low weight gain. There was statistically significant association of gestational weight gain with labour and fetal outcome. Gestational weight gain was statistically associated with the mode of delivery. Duration of labour birth weight of new born and gestational age. The timely recognition and management of inadequate gestational weight gain during pregnancy can effectively protect from adverse outcome, so the antenatal women should be motivated for adequate weight gain during pregnancy for optimal fetal outcome. There is a need to identify the cases of inadequate ges-

tational weight gain and provide necessary care throughout pregnancy.

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A Prospective Study on Non-closure and Closure of Visceral and Parietal Peritoneum During Caesarean Section

H. C. Savitha¹, C. Sanjay Kumar¹, M. S. Sowmya¹

ABSTRACT

Introduction: Caesarean section is the most common surgery performed in Obstetrics and is some times associated with the morbidity. The present study was conducted to assess the short term morbidity of non-closure of the visceral and parietal peritoneum at caesarean section as compared to suturing of peritoneum.

Materials and Methods: A prospective study of two hundred women undergoing caesarean section was done; randomised into non-closure and closure groups. Preoperative, intra-operative and postoperative details were observed.

Results: Operating time, anaesthesia time and time of ambulation were significantly shorter in non-closure group. There was less postoperative pain, analgesic requirement and febrile morbidity in non-closure group. However, it was statistically not significant.

Conclusion: Non-closure of the visceral and parietal peritoneum is a simpler operative technique, more cost-effective, associated with fewer postoperative complications and lower febrile morbidity and provides a shorter surgical procedure. Hence, routine closure of peritoneum at caesarean can be avoided.

Keywords: caesarean section, peritoneum, closure, non closure.

INTRODUCTION

Caesarean section is most frequent major surgical procedure performed in obstetrics. The lower uterine segment operation pioneered by Munro Kerr in the early 20th century is now performed in over 90% caesarean sections. Since then, both visceral and parietal peritoneal layers have been traditionally closed in separate layers.¹

Recently this practise has been questioned. Animal and human studies support that closure of the pelvic peritoneum does not reduce the incidence of postoperative pain, adhesions or obstruction.²

If the peritoneum is left open, the spontaneous reperitonization will occur within 48-72 hours with complete healing after 5-6days.³

General surgery reports have shown that suture peritonealisation tends to cause tissue ischemia, necrosis and inflammation and foreign body reactions to suture materials.⁴ This factor may slow down the healing process and are considered important precursors for adhesion formation.

Among many advantages of leaving the peritoneum includes reduced operating time, fever, intra-abdominal adhesions, less postoperative morbidity and earlier discharge from the hospital.⁵

Finally, Royal College of obstetricians and Gynaecologists (RCOG) green top guidelines suggested that non-closure appears to have fewer associated risks.

MATERIALS AND METHODS

This is a prospective study to determine the short term clinical outcome of non-closure in comparison with closure of visceral and parietal peritoneum at caesarean delivery. It was carried out at the department of obstetrics and gynaecology, Mandya Institute of Medical Sciences, mandya, Karnataka, from June 2015 to October 2015. Two hundred women undergoing emergency or elective lower segment caesarean section were taken for the study. Exclusion criteria were history of previous lower abdominal surgery, severe anaemia, presence of pelvic infections or adhesions, morbid obesity and foul smelling vaginal discharge.

After detailed history, examination and investigations, informed written consent was obtained from each patient for participation in the study. All the women underwent lower segment caesarean section through Pfannenstiel incision. Uterus was closed with continuous number one polyglactin. In the control group, both the layers of peritoneum were sutured with continuous 1-0 chromic catgut. Rectus sheath was closed with continuous number 1 polyglactin. The skin was approximated with continuous subcuticular number 2-0 ethilon. Study group had similar procedure of caesarean section but without re approximation of visceral and parietal peritoneum.

Injectable antibiotics were given for first 2 days of surgery and oral antibiotics for next five days.

After the operation, all the patients were managed in the

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same postoperative ward. In the absence of complications, patients were discharged on the seventh postoperative day. The outcome measures noted were anaesthesia time, operating time, postoperative pain, duration of the ileus, time of ambulation, febrile morbidity, endometritis, cystitis, wound infection and length of hospital stay. Analgesic injection diclofenac sodium 75mg / tramadol 50mg intramuscularly, were given 12th hourly, in the first 24hours of the surgery and then as needed. Analgesics were changed over to oral on the second postoperative day.

Postoperative pain was assessed by 10cm visual analog scale – VAS (no pain=0, worst pain ever=10) at 24hours after surgery and daily till the time of discharge. Women were asked to indicate average intensity of pain they had experienced during last 24hours. Oral alimentation was reintroduced once bowel sounds were returned.

Febrile morbidity was defined as temperature more than 38°C on two occasions at least twelve hours apart, excluding first postoperative day. Endometritis was diagnosed if uterine tenderness, vaginal discharge and fever were present. Cystitis was diagnosed by positive urine culture growth or more than 1,00,000 colonies per ml of single species of bacteria in urine. Wound infection was diagnosed when there was serous or purulent discharge from the skin incision with erythema and induration, with or without fever. Significance of difference, if any, in the observations made of variables studied in control/study groups, in numbers or averages was determined using Chisquare (X²) or student t-test, as applicable.

RESULTS

Among the 200 women enrolled in the study, 100 study groups had non-closure while 100 control groups had closure of parietal and visceral peritoneum at caesarean section. Patient's characteristic about age, parity and gestational age has been described in table 1. Type of anaesthesia, elective or emergency caesarean data, were shown in table 2 and 3 respectively.

The outcome data is shown in table 4. The average duration of operation and anaesthesia were less by 11.5 minutes and 10.4 minutes respectively in the study group. Women in study group requiring additional analgesics, either oral or parenteral, were less than that in the control group. 21 from the study and 25 control group required additional analgesic. However, the difference was not significant. Mean total score in the study group was less as compared to that in control group.

Time of oral intake and ambulation was less in study group than in control group. The febrile morbidity was high in control group as compared to that in the study group. However it is not statistically significant. Cystitis was found in 3 cases from the study group and 5 cases from the control group.

Four from the study group had wound infection as compared to seven in the control group. The mean hospital stay in study group was 7.17days as compared to 7.29days in control group. Four from the study group and seven from the control group stayed in the hospital for more than 8 days because of wound infection.

	Non-closure n=100	Closure n=100	Statistical significance
Age (years) mean±SD	23.5 ± 4.4	22.7±3.7	t=1.3, p=0.2, not significant
Parity mean±SD	0.6 ± 1.1	0.5±1.1	t=0.4, p=0.6, not significant
Gestational age mean mean±SD	37.5±2.3	37.6±2.0	t= 0.3, p=0.6. not significant

Table-1: Patient characteristics

	Non-closure n=100	Closure n=100	Statistical significance
General Anaesthesia	19	20	X ² =0.4, p=0.4
Spinal	81	80	Not significant

Table-2: Type of anaesthesia given

	Non-closure n=100	Closure n=100	Statistical significance
Elective	13	9	X ² =0.1, p=0.8
emergency	87	89	Not significant

Table-3: Types of caesarean section

Parameter	Non-closure n=100	Closure n=100	Statistical significance
Operative time minutes mean±SD	32.7±4.9	44.2±4.61	T=16.74, p<0.0001 significant
Anesthesia time minutes mean±SD	42.1±5.03	52.5±4.67	T=16.06, p<0.0001 significant
Total pain score mean±SD	35.58±3.30	36.56±3.91	T=1.83, p=0.06
Febrile morbidity(no. of patients)	10	16	X ² =0.004, p=0.57
Time of oral intake days mean+-SD	1.34±0.47	1.61±0.49	T=1.30, p=0.19 significant
Time of ambulation days mean±SD	1.39±0.51	2.28±0.56	T=11.22, p=0.0001 significant
Wound infection (no. of patients)	4	7	X ² =0.35, p=0.55 not significant
Hospital stay days mean±SD	7.17±0.75	7.29±1.00	T=1.10, p=0.27 not significant

Table-4: Outcome data

DISCUSSION

Peritoneal non-closure in caesarean sections will certainly reduce the surgery time by few minutes which attracts many studies to advocate non-closure.⁶ Histological studies in animals have revealed that the peritoneum regenerates *denovo* and not from the cut edge of the defect as in skin wounds because the entire surface becomes mesothelialized simultaneously. Therefore peritoneal defects even large when left undisturbed demonstrate mesothelial integrity by 48 hours and complete indistinguishable healing by five days. Leaving the peritoneum open for the debris to be digested by the activity of peritoneal macrophages might be beneficial. Irrespective of the factors influencing the surgical time, in the study, there was a significant reduction in the operating time of 11.5 minutes in the study group. This finding is consistent with those of other studies who have reported shorter operative time in these groups of patients.

However, in the present study, surgical time was more than 10 minutes shorter, probably because both parietal and visceral peritoneum were left unsutured; whereas Pietrantonio *et al*, left only parietal peritoneum open and Nagele *et al*, left only visceral peritoneum open.^{7,8} The decrease in operative time reduced the duration of anaesthesia exposure and that of exposure of wound to the environmental contaminants. This is reflected in decreased incidence of febrile morbidity and has reproduced the observations made by other researchers. Non-closure of the peritoneum might reduce the intensity of the postoperative pain due to less manipulation of parietal peritoneum, which is sensitive to pain. In addition, ooze or clots in the closed peritoneal space behind uterovesical fold could be significant factor for postoperative pain in peritoneal closure groups.

Nagele *et al*, Hojberg *et al*, and others found reduced usage of oral analgesics in the study group.^{8,9,10} Present study did not show statistically significant difference in the pain medication requirement in the two groups. The mean pain score was less in study group and similar finding was also reported by Rafique *et al*.¹¹ Incidence of wound infection was less in study group compared to control group, however, it was not statistically significant. Grundsell showed a decreased incidence of wound complications in the non-closure group.¹²

CONCLUSION

Avoiding the closure of visceral and parietal peritoneum during caesarean section is associated with lesser operating time, decreased incidence of febrile morbidity, lesser need for postoperative analgesics and quicker recovery than the closure group. Hence, routine closure of peritoneum during caesarean can be avoided. However, long term studies are recommended to compare the late outcomes of peritoneal closure and non-closures during caesarean sections.

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Impact of Maternal Anemia at Term on Neonatal Hemoglobin, Sr.iron and Total Iron Binding Capacity

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ABSTRACT

Introduction: There are hardly any studies to see the relation between maternal anemia and cord blood hemoglobin in south India. This study endeavours to study the relation between maternal anaemia and cord haemoglobin. Objectives of the study was to look for an association between maternal hemoglobin, ferritin and TIBC of term mothers with the corresponding parameters in cord blood samples post delivery.

Material and method: A cross sectional study was done where Maternal and cord blood samples of 149 term mothers chosen by systematic random sampling, delivering at G.H Karaikal between January to April 2015 were collected and assessed for hemoglobin, ferritin and TIBC (Total iron binding capacity). Data was analyzed by SPSS 16.

Results: There was a high prevalence (63.7%), of anemia among the mothers in our study. The comparative mean hemoglobin, ferritin and TIBC levels in cord blood samples of anemic/non-anemic mothers was 8.2/12.3, 120/175 and 512.9/285.4 with a highly statistically significant difference on analysis ($p < 0.001$) for all three parameters.

Conclusion: Maternal iron and hemoglobin levels do have a significant impact on neonatal hemoglobin and serum iron.

Keywords: anaemia; haemoglobin; ferritin; TIBC.

INTRODUCTION

Anemia in pregnancy is a major challenge for obstetric care in developing countries.¹ any of these women may be anaemic before conception.

Causes of anemia during pregnancy in developing countries are multifactorial. This include nutritional deficiency (iron, folic acid and B12) and parasitic diseases such as malaria, hook worm infestation.² However micronutrient deficiency, especially iron deficiency anemia is main cause for anemia in pregnancy.³ Pregnant women are particularly vulnerable to iron deficiency because of increased iron demand. The expansion of plasma volume, increase in erythropoiesis and increase in fetal placental unit for iron throughout gestation and individuals variations are possible.

Due to hemodilution and metabolism of iron, serum ferritin concentration in women with adequate iron stores initially rises, then falls progressively by 32 weeks to about 50% pre pregnancy levels, to rise again mildly in the third trimester. The placental transfer of iron from maternal circulation to fetal circulation is controlled by hepcidin, when hepcidin

concentration are low, iron enters blood plasma at high rate, when hepcidin concentration is high ferroprotein is internalized and iron is trapped in enterocytes, macrophages and hepatocytes.^{4,5} Though fully high values may be found in acute and chronic inflammatory conditions, the measurement of serum ferritin, serum iron and TIBC concentration has been shown to be good index of iron stores. This is preferred for examination of bone marrow appreciates for hemosiderin, a gold standard for iron store.

Iron transfer to the foetus occurs maximally after 30 weeks of gestation.⁵ time peak efficiency of maternal iron absorption following a considerable fall in serum ferritin level which occurs between 12 and 25 weeks of gestation. This probably occurs as the result of iron utilisation by maternal and fetal red cell masses.

The aim of this study is to establish the mean values for pre delivery hemoglobin, TIBC concentration of anemic and non anemic mother and to compare those values with the cord blood haemoglobin and serum iron and TIBC concentration of their newborn.

MATERIALS AND METHODS

A cross sectional hospital based pilot study was done at GH karaikal- Pondicherry ut between jan to apr 2015. the study was approved by ethics and research committee of VMMC-Kkl.

This study was done with the following objectives to assess the Hb, TIBC and serum iron of pregnant mother, to assess the cord blood Hb, TIBC and serum iron and to compare the both.

200 women were randomly selected. Blood Hb%, Sr.Iron and TIBC were done for the mother at term. At delivery the newborn were subjected for Hb%, Sr.Iron and TIBC estimation these were done by iron and TIBC kit –ferrozine

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method,corel clinical system.Data was analysed by SPSS 16. Of the 200 mothers who were enrolled for 149 mother-baby pairs blood --- could be done

Inclusion criteria

Pregnant women who were clinically anemic, HIV negative, Nonsmoking and who gave consent were chosen randomly based on cut off of Hb conc. (10g/dl). All pregnant women enrolled belonged to the age group of 19 to 37 yrs. This consist of anemic pregnant women (Hb< 10g/d) and non anemic pregnant women (Hb>10g/d) respectively.

The new born were grouped into haemoglobin concentration via non anemic and anemic, the cutoff value for serum iron (35 -145) for that pregnant women and (150 -220µ/dl) for the newborn cutoff values for TIBC (250 - 400µ/dl) for both pregnant and neonate.

Exclusion criteria

The pregnant women with history of chronic illness such as Sickle cell disease, Renal disorder, hepatitis and those with obstetric complication such as pre term labour, placenta previa, pih, gdm, hiv infection and vaginal bleeding during pregnancy were excluded.

Blood sampling

Five millilitres(5ml) of blood collected from each women before labour and three millilitre(3ml) was collected from the cord of their new born into ethylenediaminetetraacetic acid

(EDTA) tube for full blood count analysis. the same amount of blood was collected from each participant in to plain tube for serum. Iron and TIBC assays. blood sample was collected immediately after the pregnant women admitted into the labour ward at 38 week of gestation. haemoglobin concentration was measure using the autoanalyser mode on the same day of collection. while blood for sr.iron and TIBC was done using iron and TIBC -kit ferrozine method. The iron and TIBC kit was manufactured by coral-clinical system.

STATISTICAL ANALYSIS

Analysis were performed using SPSS-version-16. The descriptive data were expressed as mean±SD. A probability value of P<0.05 was considered to indicate statistically significant.

RESULTS

There was a high prevalence of 63.7%, of anemia among the mothers in our study. The comparative mean hemoglobin, ferritin and TIBC levels in cord blood samples of anemic/non-anemic mothers was 10.873/16.99, 120/175 and 512.9/285.4 with a highly statistically significant difference on analysis (p<0.001) for all three parameters.

Table 1 describes pregnant mother haemoglobin, Sr.iron,

TIBC parameter between anemic and non anemic group. SD, mean, minimum and maximum level of each shows significant p-value P<0.001. Table 2 describes parameter of newborn of anemic and non anemic mothers-SD, mean haemoglobin and significant p-value P<0.001. Table 3 describes Pearson coreation –coefficient between maternal and foetal Hb, Sr.iron, TIBC and shows significant p-value. P<0.001

DISCUSSION

The mean cord hemoglobin in newborns among cases was 16.99g/dl. The cord hemoglobin appears to show a linear relationship with maternal hemoglobin, with cord hemoglobin being less in newborn whose mothers have anemia. Mothers who had more severe anemia had babies with lower cord hemoglobin.

Mothers who had anemia were more likely to deliver anemic babies i.e. babies with cord hemoglobin<14 g/dl. Such babies would be more likely to develop significant anemia

	Anemic group	SD	Non-anemic group	SD
Mothers Hb				
Mean	8.2	0.71	12.3	1.6
Minimum Hb	7		10	
Maximum Hb	9		14.8	
Mothers serum iron				
Mean	31.8	5.27	114.04	31.84
Maximum Hb	12		49	
Maximum Hb	40		200.4	
Mothers TIBC				
Mean	489.23	82.98	284.15	28.64
Minimum Hb	402		256	
Maximum Hb	800		458	
P-vau <0.001				
Table-1: Pregnant mother haemoglobin, sr.iron, tbc parameter				

Haemoglobin	Mean	SD	P-Value
Anemic	10.873	1.16	P<0.001
Non-anemic	16.959	1.5	
Table-2: Parameter of newborn of anemic and non anemic mothers			

	Coreation between	Pearson coreation -coefficient	P-vau
1	Maternal Sr.iron and Hb	0.945	P<0.001
2	Maternal Sr.iron and TIBC	-0.739	P<0.001
3	Foetal Sr.IRON and TIBC	-0.820	P<0.001
4	Maternal Sr.Iron and foetal Sr.iron	0.779	P<0.01
5	Foetal Sr.iron and Hb	0.836	P<0.01
Table-3: Pearson coreation – coefficient between maternal and foetal Hb, Sr.iron, TIBC			

at an earlier age than babies born to non-anemic mothers.^{1,6-9} In contrast to our study some previous investigators have failed to find a relationship between maternal and cord hemoglobin, thus leading to the conclusion that the fetus continues to extract iron efficiently from the mother regardless of her iron status.^{2,3} It is thought that iron is actively transported from mother to fetus.^{4,5} In the iron deficiency state, there is up regulation of iron transport proteins in the placenta thus ensuring an adequate iron supply to the growing fetus even in the anemic mother. Our study thus gives a new insight regarding anaemia in newborn. There are some limitations in our study. We did not assess the sr.ferritin status of the mother and baby directly and it was assumed that iron deficiency was the cause of anemia. However, it is likely that mothers who were anemic during labor had poor iron intake throughout their pregnancy and that this was reflected in the cord hemoglobin.

Further studies from this area which assess the maternal and fetal sr.ferritin levels would help to give a more accurate idea of the dynamics of iron accumulation in the fetus.

CONCLUSION

Anemia is frequently observed during pregnancy. The study enabled the research to identify the association between maternal haemoglobin level and pregnancy outcome. Based on statistical findings, it is evident that maternal iron and hemoglobin levels do have a significant impact on neonatal hemoglobin and Sr. iron.

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Study of Skin Manifestations Among Migrant Workers in a Coastal City of Dakshina Kannada District, Karnataka

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ABSTRACT

Introduction: Skin manifestations are more common in migrant labourers because of poverty, ignorance, overcrowding, poor hygiene and exposure to common irritants and sensitizers in the construction. Occupational diseases comprise multiple manifestations, skin manifestations being the most predominant. Aims and objectives of the study were to Study of skin manifestations among migrant workers and to determine the socio demographic profile of these workers

Material and Methods: Migrant population in coastal city will be the study population. Study duration: From November 2013 to April 2014. Study design: Cross sectional study. Subjects of this study will include migrant population from 4 different areas of coastal city. Clinical examination was done in a well-lighted room at the site of camp. Pretested questionnaire was used to collect data by interview method.

Results: 255 workers examined had presentation of various dermatoses. The most common age group was 21- 30 years (28.23%). A total of 181 males (70.98%) and 74 females (29.02%) were examined. The subjects with fungal dermatoses recorded was 36.07 %. Bacterial infections contributed to 19.60 %, of all dermatoses. 08.23% of the workers examined had viral infection. Scabies was seen in 6.66% of workers. Amongst the non-infective dermatoses, Contact dermatitis was seen in 16.86%.

Conclusion: The pattern of dermatoses presented in these groups is expressive of ignorance, poverty, living in overcrowded condition. So education of these workers in the health aspects, provision of cost effective and efficient protective measures will help reduce the morbidity of the migrant workers.

Keywords: Migrant workers, Contact dermatitis, Dermatoses

masons, helpers, fitters, supervisors, carpenters and painters. Occupational diseases comprise multiple manifestations, skin manifestations being the most predominant. Various agents encountered at the workplace can cause injury, irritation, sensitization, infection, discoloration or any other changes in exposed workers

Most common exposures in migrant labourers which the general population will not be encountered, are exposure to organic and inorganic dust, fungi, bacteria and chemicals. These additional exposures result in diverse skin problems. Other obstacles in accessing health services to migrants are language barriers. These workers also live in unhygienic conditions and due to low income and lack of health insurance have limited affordability of the available health services.

MATERIAL AND METHODS

Source of data

Study population: Migrant population in Mangalore City Corporation limits in different places. 1. Shakti nagar health centre 2. Bharati ship yard in Tanir bhavi, 3. Construction site in Kulashekara, 4 Construction workers at Kottara chowki, Study duration: From November 2013 to April 2014. Study design: Cross sectional study. Sample size: 255 Inclusion criteria: Migrant workers of Mangalore city not residing for more than 3 years are included. Exclusion criteria: Resident laborers of Mangalore city residing for more than 3 years are not included.

Method of collection of data

Informed written consent was obtained by explaining to the subjects about the method of study, outcome and possible intervention. A pre-tested semi structured questionnaire was

INTRODUCTION

Migration is a process of social change during which a person moves from one cultural setting to another to settle for a longer period of time or permanently.¹ A migrant labourer is someone who is engaged or has been engaged in a remunerated activity in a place of which he/she is not a part.² Skin manifestations are more common in migrant labourers because of poverty, ignorance, overcrowding, poor hygiene and exposure to common irritants and sensitizers in the construction industry. Contact dermatitis is the most common, comprising 20-90% of all the cases.³ In the construction industry, various categories of workers are involved such as

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used for collection of data. Data was collected by interview cum, clinical examination. Clinical examination was done in a well- lighted room at the site of camp.

RESULTS

In the table-1 out of the total 255 migrant workers, 145 (56.86%) migrant workers were married and 110 (43.14%) migrant workers were unmarried. Majority of the migrant workers were Hindus by religion- 122 (47.84%) followed by Muslims – 84 (32.94%). In 255 migrant workers, 181(70.98%) were male workers and 74 (29.02%) were female workers.

In the table-2 out of 255 migrants were examined, 98 (38.43%) workers belonged to the age group of 21-30 year and 72 (28.23%) workers belonged to the age group of 31-40 years. The youngest migrant worker was 13 years of age and the oldest was 65 years in age.

Table 3 shows the distribution of infective dermatoses among migrant workers. In that fungal infection was the most common (36.07 %) followed by bacterial (19.60%) and viral infection (8.23%). The parasitic infection was scabies seen in 6.66% of the migrant workers. In fungal infection tinea cruris was found in 13.72 % of the migrant workers followed by pityriasis versicolor 10.19% and tinea corporis 8.23 %. Amongst the bacterial infection, acne vulgaris was the most common with 07.05% followed by folliculitis 05.09%, pyoderma with 4.31% and furuncles with 3.31%. In the viral infections, herpes infection was seen in 3.13 %, molluscum contagiosum 2.74 % and warts in 2.35 %.

Table 4 shows the distribution of non- infective dermatoses in migrant workers was 52.15%. The most common was contact dermatitis 16.86% followed by eczema with 11.37% and photo dermatitis with 08.62%. Fissured feet was found in 5.09% migrant workers and miliaria was found in 4.70% migrant workers. Callosity was seen in only 2.35% migrant workers.

DISCUSSION

255 migrant workers in different areas of Mangalore city Corporation were included in the study. Majority of the workers belonged to the age group of 21-30 years followed by 31- 40 years. Male workers were more (70.98 %) followed by females (29.02%). Majority of the workers were married (56.86%). The large group of workers were Hindus (47.84%) followed by Muslims (32.94%) and Christians (12.15%)

In the present study on various infective dermatoses, fungal infection was the most common (36.07 %). This was because of the hot and humid climate of Mangalore which is a coastal city which creates an ideal environment for the propagation of superficial dermatophytic infections of the migrant workers. Tinea cruris was found in 13.72 % of the migrant workers followed by pityriasis versicolor 10.19% and tinea

Socio-demographic factors	Number (N=255)	%
Marital status		
Married	145	56.86
Unmarried	110	43.13
Total	255	100
Religion		
Hindu	122	47.84
Muslim	84	32.94
Christian	31	12.15
Others	18	07.05
Total	255	100
Sex		
Male	181	70.98
Female	74	29.02
Total	255	100

Table-1: Socio- demographic distribution of the migrant workers

Age group	Number	Percentage
10- 20	34	13.33
21- 30	98	38.43
31- 40	72	28.23
41- 50	41	16.07
More than 50	10	03.92
Total	255	100

Table-2: Age group distribution of the migrant workers(n=255)

Sr. No	Fungal infections	Number	%
1	Tinea cruris	35	13.72
2	Pityriasis versicolor	26	10.19
3	Tinea corporis	21	08.23
4	Candidiasis	10	03.92
	Total	92	36.07
	Bacterial Infection		
1	Acne vulgaris	18	07.05
2	Folliculitis	13	05.09
3	Pyoderma	11	04.31
4	Furuncles	8	03.13
	Total	50	19.60
	Viral Infections		
1	Herpes infection	8	03.13
2	Molluscum contagiosum	7	02.74
4	Warts	6	02.35
	Total	21	08.23
	Parasitic		
1	Scabies	17	06.66

Table-3: Distribution of infective dermatoses seen in migrant workers (n=255)

corporis 8.23 %.

Maria Kuruvila et al have done a study on pattern of skin disease amongst migrant construction workers in Mangalore in the year 2006 and they have found 46.25% fungal infection in workers.⁴ Sanjiv Grover et al have done a cross sectional study on skin disease in rural Allahabad and found fungal infection(54.52%.) were the most common.⁵

In the present study, bacterial infection constituted 19.60 %,

Sr. No	Others	Number	%
1	Contact dermatitis	43	16.86
2	Eczema	29	11.37
3	Photodermatitis	22	08.62
4	Fissured feet	13	05.09
5	Miliaria	12	04.70
6	Psoriasis	8	03.13
7	Callosity	6	02.35
	Total	133	52.15

Table-4: Distribution of non- infective dermatoses in migrant workers(n= 255)

this may be due to unhygienic condition at the working place or site of work and humid climates. Amongst the bacterial infection, acne vulgaris was the most common with 07.05% followed by folliculitis 05.09%, pyoderma with 4.31% and furuncles with 3.31%.

Maria Kuruvila et al have done a study on pattern of skin disease among migrant workers in Mangalore and they have found to have bacterial infection in 24.83% of migrant workers.⁴

In the present study 08.23% of the workers examined had viral infections. Amongst the viral infections, herpes infection was seen in 3.13 %, molluscum contagiosum 2.74 % and warts in 2.35 %.

Maria Kuruvila et al have done a study on pattern of skin disease among migrant workers in Mangalore and they found to have viral infections in 6.42% of workers and warts were most common with 3.64%.⁴ Porta N et al have done a study on the immigrant population in Miguel Servet hospital in Saragossa in 2004 and they found to have viral infection in 11.8% of the patients and the most common was genital warts with 1.7%.⁶

In the present study, parasitic infection was scabies found in 17 patients (6.66%) Scabies was seen because of overcrowding and close contact. Maria Kuruvila et al have done a study on pattern of skin disease among migrant workers in Mangalore and they have found to have scabies in 8.56% of the migrant workers.⁴ Porta N et al have done a study on the immigrant population in Miguel Servet hospital in Saragossa in 2004 and they found to have parasitic infections in 2.07% of the study population.⁶

In the present study, 52.15 % of migrant workers had non infective dermatoses. Amongst non-infective dermatoses, the most common was contact dermatitis 16.86% followed by eczema with 11.37% and photo dermatitis with 08.62%. Contact dermatitis was most common because these workers are constantly exposed to allergens like cement, chromates, chalk, food preservatives and rubber.⁷ Photodermatitis was seen in 22 patients, the obvious contributing factors leading to this form of dermatoses is prolonged exposure to sunlight at place of work. Miliaria was found in 12 migrant workers and this was attributed to environmental factors like hot and humid climate.

Fissured feet was found in 13 migrant workers because ce-

ment is a known hygroscopic substance which can lead to dryness of skin especially in those workers who do not wear protective foot wear. Callosity was seen in 6 migrant workers because it is a well-known disorder of keratinization in manual labourers.

In a study done by Maria Kuruvila et al on pattern of skin disease among migrant workers in Mangalore, they have found workers with miliaria with 10.06%, fissured feet to be 9.85% and callosity with 4.28%.⁴

CONCLUSION

Among 255 migrant workers with various dermatoses the incidence of infective dermatoses was highest. The incidence of fungal infections (36.07%) could be attributed to humidity being more owing to Mangalore city being a coastal area along with maceration due to increased sweating. The increased incidence of scabies (6.66%) and molluscum contagiosum (2.74%) could be due to living in overcrowded conditions, poverty, trauma sustained during work and poor hygiene.

From all the non- infective dermatoses, contact dermatitis to cement was significantly higher in daily wage labourers, construction workers and road workers. This high incidence in these groups may be due to prolonged and frequent exposure to allergens like cement.

The pattern of dermatoses present in these groups is expressive of ignorance, poverty, living in overcrowded condition and an unfavourable hygienic conditions leading to imbalance between man and microbes. Keeping the above mentioned reasons, education of these workers in the health aspects, provision of cost effective and efficient protective measures like clean accommodations, clean clothes, hygienic surroundings, foot wear and protective creams at site of work will help reduce the morbidity of the migrant workers.

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Radiographic Examination of the Greater Sciatic Notch in Determining the Sex among North Indian Population

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ABSTRACT

Introduction: In forensic and archaeological studies, there is the need for identification of human skeletal remains. The greater sciatic notch is very relevant in identification of sex in human skeletal remains. The features of the greater sciatic notch of the coxae are characteristic and are commonly used to determine sex in unknown individuals. Over the years, different authors had carried various types of measurements on human greater sciatic notch of different sex and races.

Material and method: This study was carried out to determine if indices in the greater sciatic notch can be used in sexing of the hip in North Indian population of Jammu and Kashmir with the help of radiograph and to establish a baseline data for the population. Antero-posterior radiographs of adult pelvis (age range: 25-75 years) were evaluated. The parameters considered are maximum width (AB); maximum depth (OC); the posterior segment (OB), index I and index II of the greater sciatic notch.

Results: Out of all these parameters, width of the notch ($p=0.001$), depth of the notch ($p=0.006$), posterior segment width ($p=0.03$), index II of notch ($p=0.001$) were found to be significantly greater in women as compared with men. However whether these radiographic parameters can be used for sex determination needs further studies to quantify the parameters over a larger population and over the bioarchaeological and forensic remains of individuals.

Conclusion: Our results suggest that metric assessment of the features of the greater sciatic notch should be used cautiously in sex determination, particularly in the case of fragmentary forensic or rare archaeological remains.

Keywords: Radiographic Examination, Sex, Greater Sciatic Notch

INTRODUCTION

Virtually every element of the adult human skeleton has been shown to exhibit some degree of sexual dimorphism.¹⁻³ However, the pelvis, or more precisely, the innominate is generally regarded as the most reliable skeletal indicator of sex.⁴⁻⁶

The pelvic bone is an ideal bone for determination of sex because it not only reflects the general differences between the sexes but also the adaptations during child bearing in females. Those authors who have studied this bone in skeletal remains have paid attention either to features relating to its total size or to those of various components, such as its infe-

rior and superior border, the greater sciatic notch, the symphyseal surface, the acetabulum, the obturator foramen, the arcuate line or the distance between defined morphological points on its borders.⁷

Correct sex identification of the human skeleton is important in bioarchaeological and forensic practice.¹⁷ Metric assessment of the greater sciatic notch has been carried out in several studies and has been evaluated for sex identification.⁹⁻¹¹ Different results related to the role of the features of the greater sciatic notch in sex determination were obtained in those studies.

There are metric and nonmetric differences in skeletal components among populations and these variations are related to genetic and environmental factors (geography, diet, lifestyle). Variations in human skeletal features also determine the racial characteristics of the populations. The racial characteristics of populations are linked to the evolutionary differentiation of the human species. Skeletal anthropometric measurements aimed at revealing regional diversity between different populations or within the same population, are beneficial for understanding the temporal evolutionary and developmental progress relevant to our species. Moreover, metric and nonmetric differences between men and women as regards the size and proportions of skeletal components are available, and these differences can be used in the identification of sex.¹²⁻¹⁷

Bruzek¹⁷ stated that in the techniques and evaluations used, the most frequently cited drawbacks for determining the sex of an individual are: 1) the high degree of observer subjectivity, 2) a lack of consistency in the evaluation of traits, and 3) a strong dependence on the results of the previous experience of the observer. Also, Bruzek indicated that it is difficult to admit that the sexual traits of the skeleton may be more

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clearly expressed in one sex than the other. The total degree of sexual dimorphism of any bone is a function of the interaction of the partial dimorphism of certain major regions of the bone. Thus, according to the concept of functional integration, lower levels of sexual dimorphism in a given morpho-functional complex can be functionally compensated by higher levels of dimorphism in another morpho-functional complex. Intersegment size relationships are sex and population-specific. With both genetic and functional components, the existence and degree of trait expression appears to be population-specific.¹⁸⁻²⁴

The features of the greater sciatic notch of the innominate bone are commonly used to determine the sex in unknown individuals. In this radiographical study, several measurements of the greater sciatic notch, e.g. width, depth and width of the posterior segment were taken in A–P view and indices I and II were calculated. In spite of the relevance of indices in the greater sciatic notch in forensic studies, anthropological, obstetrics and gynaecology; there is lack of literatures in North Indian Population. The aim of this study therefore was to determine if indices in the greater sciatic notch can be used in sexing of the hip in North Indian population with the help of radiograph and to establish a baseline data for the population.

MATERIAL AND METHOD

The present study was conducted in the Department of Anatomy, Government Medical College, Jammu using 50 radiographs of pelvis of people belonging to the North Indian population. The radiographs were obtained from the Department of Radiology, Government Medical College, Jammu. Age varied from 25-75 years. Of the 50 radiographs 25 belonged to males and 25 to females. The radiographs were obtained using the standard protocol for analog AP Xray of pelvis with both hips.

All the radiographs were free from pathological changes. In taking these measurements the radiographs were placed on the horizontal surface of an illuminator and the following measurement were taken with the help of a vernier calliper. A marker was used to mark these points for clear visualization. The definitions of the measurements were taken from the literature and were selected on the basis of their being good discriminators in previous studies. These are clearly defined in the available literature.^{19,21,25}

The piriform tubercle was taken as the posterior point (B) and the tip of the ischial spine was taken as the anterior point (A) of the width (AB). Maximum depth (OC) was determined between the baseline (AB) and the deepest point (C) of the greater sciatic notch. Also, (OB) was designated as the posterior segment.

The following parameters of the greater sciatic notch were considered:

- **Maximal width (AB):** The distance between the position A and B

- **Maximal depth (OC):** Perpendicular to the width
- **OB:** Posterior segment of the width
- **Index I:** Maximal depth (OC) x100/Maximal width (AB)
- **Index II:** Posterior segment of the width (OB) x100/Maximal width (AB)

Each variable was measured by the same observer. All linear measurements were in centimeters for each parameter. p value was calculated and value <0.05 was considered statistically significant. Radiographs showing abnormalities were not considered. For each parameter, mean and standard deviation was calculated.

RESULTS

The number of cases and the statistical data related to their age is shown in table 1. The result of the mean, standard deviation and range of all radiographic measurements in the greater sciatic notch in North Indian population are shown in table 2. The mean maximum width (AB) for males and females was 5.54 ± 0.177 and 6.33 ± 0.173 (cm). The maximal width which was described in Fig. 1 was sexually dimorphic. The females mean maximal width is significantly higher than that of the males (p<0.05)

The mean maximal depth(OC) of males and females in the greater sciatic notch was 2.14 ± 0.066 and 2.411 ± 0.087 (cm). The maximal depth which was described in Fig. 1 was sexually dimorphic. Infemales mean maximal depth (OC) is significantly higher than that of the males (p<0.05).

The mean values for posterior segment (OB) of males and females were 2.29±0.125 and 2.92±0.220 (cm). The females had a significantly larger value for posterior segment compared to the males (p<0.05).

The mean values of Index I for males and females were 38.69 ±1.722 and 38.002±1.839. The Index was comparable in the two sexes and no significant difference was noted.

The mean values of Index II for males and females were 41.44±2.315 and 46.16±3.681. The females in North Indian

Variable	Male	Female
N	25	25
Mean age	44	48
Minimum age	25	29
Maximum age	75	72

Table-1: Age and sex

S. No.	Variable	Male	Female	P value*
1.	OB	2.29±0.125	2.922±0.22	0.03
2.	OC	2.14±0.066	2.41±.08	0.006
3.	AB	5.54±0.17	6.33±0.17	0.001
4.	Index I	38.69±1.72	38±1.83	0.8
5.	Index II	41.44±2.31	46.16±3.68	0.001

*pvalue<0.05 significant.

Table-2: Comparisons of various parameters of greater sciatic notch in both sexes

population in this study had a significantly higher Index II than the males.

From the observations given in table 2 statistically significant difference between the means of various variables related to sex were seen in OB, OC, AB and index II while index I showed no statistically significant difference.

DISCUSSION

In this study, several measurements of the greater sciatic notch, e.g. width (AB), depth (OC) and width of the posterior segment (OB) were taken and Indices I and II were calculated in 50 adult (25 men and 25 women) pelvic radiographs (A/P view). Out of all these parameters, width of the notch ($p=0.001$), depth of the notch ($p=0.006$), posterior segment width ($p=0.03$), index II of notch ($p=0.001$) were found to be significantly greater in women as compared with men (Table 2).

It is generally recognized that of all the elements of the human skeleton, the innominate offers the best prospect for the correct identification of the sex of an individual. Unfortunately, the very features of the innominate that exhibit the highest levels of sexual dimorphism are frequently found to be damaged or missing in exhumed material. The highly di-



Figure-1: Showing the various measurements of the greater sciatic notch from an antero-posterior radiograph of the pelvis. A is the tip of the ischial spine, B is the piriformis tubercle, C is the deepest point on the sciatic notch, AB is the maximum width, OC is the maximum depth and OB is the posterior segment.

morphic pubic element of the innominate is especially vulnerable to postmortem damage and decay as it is covered by only a thin fragile shell of cortical bone. The identification of sex from the human skeleton is further complicated by the considerable morphological and metric variation which exists between and within human populations. Criteria for the identification of sex established on one ethnic group are unlikely to be applicable to another group of different ethnic origin. Similarly, criteria appropriate to present populations may not be appropriate for past populations and vice versa. Further, it is important that criteria used for sex discrimination should be unequivocal and hence as free as possible from subjective bias.²⁶⁻²⁹

In a study conducted by S.C. Okoseimiema and A.I. Udoaka on Nigerian population it was concluded that metric assessment of the features of the greater sciatic notch should not be used in sex determination in South Nigerian population, particularly in the case of fragmentary forensic or rare archaeological remains. In this respect, even anthropometric measurements of the skeletal remains of a single archaeological population should afford valuable information about the features of different populations. Furthermore, the different results obtained for the different populations should be useful for comparisons with similar studies and for improving the identification of human pelvis.²⁷

The morphology of the greater sciatic notch has been used in different studies addressing different populations for sex determination and some of these are summarized in Table 3. Akpan et al.²² used a total of 150 X-ray films (A-P view) of the pelvis of adult (90 male and 60 female) Nigerians to measure the width, depth, posterior segment, total and posterior angles of the greater sciatic notch. They reported that the width, depth of the greater sciatic notch and Index I were insignificant criteria but that Index II was the most useful criterion in sex determination.

Kalsey et al.²⁸ made an attempt to find the baseline data of various parameters pertaining to the greater sciatic notch of 100 hip bones of known sex (male: female = 80:20) and side (right: left = 50:50), in Punjab, India. They showed that width, posterior segment width and index II of notch were found to be significantly greater in women as compared with men. Kalsey found the notch to be deeper in women of north

Author	Population	Width (AB)	Depth (OC)	Posterior Segment (OB)	Index I	Index II
Palfrey	West Africa	+	-	+	-	-
Singh and Potturi	Varanasi	-	-	+	-	+
Dibennardo and Taylor	American whites and blacks	-	+	-	-	-
Akpan et al.	Nigeria	-	-	-	-	+
Patriquin et al.	South African whites and blacks	+	+	+	-	-
Kalsey et al.	North India (Punjab)	+	-	+	-	+
Alizadeh et al.	Iranian	+	-	+	-	+
Present study	North India (Jammu and Kashmir)	+	+	+	-	+

[+] Statistically significant variable; [-] Statistically insignificant variable

Table-3: Comparison of variables of greater sciatic notch in different studies

India, however his results were not statistically significant. Patriquin et al.²³ determined the maximal width, maximal depth and posterior width of the greater sciatic notch in whites and blacks. They reported that the width of the greater sciatic notch is larger in women but deeper in men and that there are significant sex differences among South African men and women and whites and blacks.

Steyn et al.²⁴ used geometric and morphometric analysis of the greater sciatic notch and reported that this feature may not be so reliable, especially in South African white males.

Palfrey¹⁸ studied West African skeletons of known sex and found highly significant differences between them regarding the width and posterior segment of the greater sciatic notch.

Singh and Potturi¹⁹ reported that the width and depth of the greater sciatic notch are not good criteria for sex identification and also that the width of the posterior segment and Index II successfully assigned sex to a high percentage of innominate bones, especially to the female ones.

Dibennardo and Taylor²⁰ investigated the adult coxae of American blacks and whites of known sex and found that the depth of the greater sciatic notch was larger in women in both races.

The present study is comparable with the study of Palfrey, Patriquin et al., Kalsey et al., Alizadeh et al., in case of width and posterior segment being statistically significant for sex determination in addition to index II (except Patriquin et al and Palfrey) while in Singh and Potturi the posterior segment and index II are the sole statistically significant variable. In the present study the depth of the notch has been found to be a valid variable for sex determination which is comparable to studies of Dibennardo and Taylor and Patriquin et al. Kalsey found the notch to be deeper in women of north India, however his results were not statistically significant.

While the accuracy of the measurements of the greater sciatic notch is high, all collections used in these studies are from different populations and one cannot assume the methodology would yield equally high success rates in all of them. Therefore, this study, of data from North Indian collections ensures this technique's applicability to that population.

CONCLUSION

In conclusion, our results suggest that metric assessment of the features of the greater sciatic notch should be used cautiously in sex determination, particularly in the case of fragmentary forensic or rare archaeological remains. In this respect, even anthropometric measurements of the skeletal remains of a single archaeological population should afford valuable information about the features of different populations. Furthermore, the different results obtained for the different populations should be useful for comparisons with similar studies and for improving the identification of human skeletal remains.

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Mean Platelet Volume as Predictor of Sepsis

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ABSTRACT

Introduction: Neonatal sepsis is one of the most common causes of NICU admission and one of the major causes of morbidity and mortality throughout the world. Objective of the study was to study organism-specific platelet response and to study mean platelet volume as predictor of sepsis in neonates.

Methods and Materials: Neonates admitted to single level-three intensive care units from January 2013 to 2015 were prospectively evaluated for sepsis by rapid screen test, blood counts and blood culture. In thrombocytopenic babies organism-specific platelet response and its effect on various platelet parameters were evaluated. In addition, morbidity, mortality and factors affecting survival were studied.

Results: Sepsis was diagnosed in 280 of 1100 (25%) patients. Gram-negative in 58% (161/280), Gram-positive sepsis occurred in 29% (80/280) and fungal in 4% (12/280) of patients. Thrombocytopenia was obtained in 46% (130/280) of babies. Mortality rate was higher in thrombocytopenic neonates. The frequency, severity and duration of thrombocytopenia were more with Gram-negative infection. The incidence of persistent bacteremia, multiorgan failure and death was also more in Gram-negative sepsis. Mean platelet volume was much increased in severe thrombocytopenia, Gram-negative sepsis and in non-survivors and can therefore be used as predictor of sepsis and outcome in neonates.

Conclusion: In thrombocytopenic babies with sepsis, organism-specific platelet response is seen. In addition, persistent bacteremia, multiorgan failure and death are more in these babies, and survival decreases with the increased severity and duration of thrombocytopenia. In addition MPV can be used as an early predictor of sepsis and outcome in neonates.

Keywords: Mean platelet volume, Sepsis, Thrombocytopenia

as severe thrombocytopenia is considered as platelet counts < 50 thousand/ μ l and moderate thrombocytopenia from 50,000-1 lac/ μ l. Thrombocytopenia can be induced by (1) increased platelet destruction (i.e. immune mechanisms, DIC) (2) decreased platelet production. Young platelets in circulation tend to be larger, since Platelet decreases in size as they become older. Increased Mean platelet volume (MPV) indicates an increased proportion of young platelets in the circulation because of increased platelet production and/ or destruction.² Mean platelet volume (MPV) is a machine-calculated measurement of the average size of platelets found in blood and is typically included in blood tests as part of the CBC.³ These calculations can give the doctor additional information about platelets and/or about the cause of a high or low platelet count. A typical range of platelet volumes is 10–12 fL (femtolitre).² MPV is an easily accessible prognostic marker of mortality in sepsis. If one sees a sepsis patient with elevated MPV, he might attempt more aggressive therapy. MPV is easily obtained because it "is like a waste product of a complete blood count. MPV might be more specific than procalcitonin and CRP."⁴

MATERIAL AND METHODS

The G. B. Panth children hospital is the largest tertiary care children hospital of Jammu and Kashmir state, with a NICU capacity of around 110 and about 160 pediatric beds. Jammu and Kashmir is the northern state of India with an estimated population of about 7-million. This study was conducted in this hospital in year 2013 starting from January. The inclusion criteria of the study is to include all neonates who were admitted to the neonatal intensive care unit with a documented diagnosis of sepsis delivered in the same hospital; those born somewhere else but referred to the hospital because of sepsis; or neonates who developed sepsis during the period

INTRODUCTION

Neonatal sepsis is one of the most common causes of NICU admission and one of the major causes of morbidity and mortality throughout the world.¹ Clinical features of sepsis are subtle, nonspecific, might be easily confused with other non-infectious causes and can rapidly lead to death if left untreated. There are early markers of sepsis like CRP, micro ESR, Procalcitonin, IL-6 and Thrombocytopenia and neonatologist has to rely on these markers for early diagnosis of sepsis. Thrombocytopenia has been used as an early but a non-specific marker for sepsis.² Thrombocytopenia is usually defined as a platelet count of less than 1.5 lac/ μ l. Where-

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of hospitalization for another reason. Ethical approval was obtained from the hospital's ethics committee and informed consent was obtained from all parents. Neonates with sepsis were enrolled to the study, and those without sepsis were selected as controls. Gestational age was determined by new Ballard score and by a first trimester ultrasound scan. Maternal age, maternal medical diseases, maternal infection, and antenatal and postnatal follow-up medical problems were obtained from maternal records. Modes of delivery (vaginal or cesarean section (C/S)), gender, birth weight, and APGAR scores at 1st and 5th minutes were recorded. During the study period, infants were divided into two groups, sepsis and control (no sepsis). Sepsis was defined according to the International Sepsis Definition Conference as 'clinical syndrome characterized by the presence of both infection and systemic inflammatory response syndrome.' Systemic inflammatory response syndrome in the case of neonates is defined as two or more of the following: (1) tachypnea (respiratory rate >60bpm) plus grunting/retractions or desaturation, (2) temperature instability (<36 °C or >37.9 °C), (3) capillary refill time >3 s, (4) white blood cell count (<5000 × 10⁹ per l or >34000 × 10⁹ per l), (4) CRP>10mg per 100ml or >2 s.d. above normal value, (5) interleukin 6 or 8 >70pg ml⁻¹, (6) procalcitonin >8.1 mg per 100ml or >2 s.d. above normal value 15,16,17,18. Sepsis is defined as one or more systemic inflammatory response syndrome criteria with signs of infection. Severe sepsis is defined as sepsis associated with hypotension or single-organ dysfunction. Septic shock is defined as severe sepsis with hypotension requiring fluid resuscitation with inotropic support. Multiorgan dysfunction syndrome is defined as the presence of multiorgan failure despite full supportive treatment. Blood was drawn from the neonates, who had the clinical signs of sepsis, from either the peripheral vein or artery for evaluation of whole blood count, Mean platelet volume (MPV), C-reactive protein (CRP) and culture at diagnosis. Blood and CSF cultures were analyzed using fully automated BACTEC method. Blood culture was done every 72 hours and complete blood count every 48 hours or whenever the clinical condition of patient would demand. Blood samples for complete blood picture were analyzed by using coulter counter machine. All cases were managed with intravenous antibiotics and other supportive measures. Initial antibiotics combination used in this hospital are: ampicillin or third generation cephalosporin and aminoglycosides, which were changed, with therapy, according to culture and sensitivity result.

This prospective study was conducted to study the value of platelet size in neonates with sepsis, and also to study whether mean platelet volume (MPV) can be used as a predictor of neonatal sepsis. Also, to determine any significant differences in platelet size (MPV) present between those due to gram- negative, gram-positive and fungal sepsis. We used SPSS software version 16 for the calculation of p- value in our study. SPSS software was used for statistical analysis in our study.

RESULTS

Out of 1100 neonates admitted in NICU, 280 babies were admitted as sepsis. As shown in the table-1. Gram negative sepsis was the commonest form of sepsis 161/280 (58%). Thrombocytopenia occurred in 130/280 (46%) babies with sepsis. Among these babies, 27 (21%) were having mild thrombocytopenia, 29 (22%) moderate thrombocytopenia and 74 (57%) had severe thrombocytopenia. Incidence of thrombocytopenia in neonates with Gram negative sepsis was 72/161 (45%), versus gram positive sepsis 26/80 (32%). 5/12 (41%) in fungal sepsis developed thrombocytopenia. Among patients with thrombocytopenia gram negative organisms were seen in 72/130 (55%), gram positive 26/130 (16%) and fungal in 5/130 (4%) as shown in table-2. 27 neonates had clinical features of sepsis but their cultures were persistently negative. Klebsiella pneumoniae was the most common organism 48/130 (37%) followed by Acinetobacter (12%) and E. coli (4 %) and pseudomonas in (2.3%). Among gram positive organisms staph.aureus was seen in 20/130 (15%), Enterococcus in (3%), CONS in (1.5%). Lowest Platelet count in gram negative sepsis was (48 × 10³/μl) compared to (65 × 10³/μl) in gram positive sepsis and (54 × 10³/μl) in fungal sepsis (p = 0.08). The mean platelet volume initially (MPV-A), before the onset of sepsis; for gram negative sepsis was 10.1 ± 1, gram positive sepsis 10.3 ± 1.1, and fungal sepsis 10.5 ± 10.7. The difference was not statistically significant (p=0.4). MPV at the time of onset of sepsis (MPV-B) was high in gram negative sepsis than in gram positive sepsis (12.5 ± 1.2 Vs 11.4 ± 0.9) although sta-

Gram-negative (58%)	Klebsiella	100	35.7%
	Acinetobacter	42	15%
	E. Coli	10	3.7%
	Pseudomonas	9	3.2%
Gram-positive (29%)	Staph. Aureus	52	18.6%
	Enterococcus	11	3.9%
	CONS	17	6.1%
Yeast (4%)		12	4.3%
Culture-negative (9%)		27	9%
Total	N= 280		100%

Table-1: Organisms causing sepsis in neonates.

			Number	%
Organism	Gram negative 72 (55%)	Klebsiella	48	37%
		Acinetobacter	16	12%
		E. Coli	5	3.8%
		Pseudomonas	3	2.3%
Gram positive 26 (20%)	Staph. Aureus	20	15%	
	Enterococcus	4	3%	
	CONS	2	1.5%	
Yeast		5	4%	
Culture negative		27	21%	
Total		130	100%	

Table-2: Organism distribution in thrombocytopenic neonates

Feature	Gram-negative (n=72)	Gram-positive (n=26)	Fungal (n=5)	P. value
1 Platelet nadir	48 ± 47	65 ± 42	54 ± 37	0.08
2 Mean duration of thrombocytopenia (days)	7.2 ± 5	6.3 ± 3.6	9 ± 2.9	<.02
3 Mortality	21 (29%)	6 (23%)	0	
4 (MPV-A) initially.	10.1 ± 1	10.3 ± 1.1	10.5 ± 0.7	0.4
5 (MPV-B)	12.8 ± 1.2	11.4 ± 0.9	11.7 ± 0.7	0.5
6 Multiorgan failure	20/72 (28%)	2/26 (7%)	0	<0.01

Table-3: Platelet parameters in septic, thrombocytopenic neonates.

MPV	Group	No.	MPV	P. Value
	No Sepsis	100	9.8 ± 1.01	
	Sepsis non-Thrombocytopenia	150	10.1 ± 1.04	<0.01
	Sepsis Thrombocytopenia	130	12.5 ± 1.08	

Table-4: Mean Platelet Volume of thrombocytopenic and non-thrombocytopenic neonates

tistically non-significant ($p = 0.5$) as shown in table -3. The mean duration of thrombocytopenia in gram positive sepsis was less than fungal and gram negative sepsis. Patients with gram negative sepsis had significantly higher incidence of multiorgan failure and death. None of the patients in fungal sepsis died. For comparison of MPV, neonates admitted with neonatal jaundice without sepsis were taken as control group. Mean platelet volume of thrombocytopenic neonates was significantly higher than that of non-thrombocytopenic neonates ($p < 0.01$). The average MPV of neonates without sepsis (9.8) was lower than neonates with sepsis but without thrombocytopenia. Highest MPV was seen in septic, thrombocytopenic neonates as shown in table-4.

While comparing survivors and non-survivors, survivors had higher weight and gestation. Non-survivors tend to have greater severity of thrombocytopenia ($p < 0.01$). Mean platelet volume in case of non-survivors was also significantly higher owing to greater severity of thrombocytopenia.

DISCUSSION

The incidence of neonatal sepsis is high in developing countries (1.7–33 of 1000 live births) and in Asia, it clusters around 15 of 1000 live births.⁵ A review of 11 471 blood samples from all developing nations of the world revealed that Gram-negative rods were isolated in 60% of positive cultures⁵ with *Klebsiella pneumoniae* being the commonest organism. Similar trends were observed in our patients. *Klebsiella* followed by *staph aureus* are the most common two pathogens causing sepsis in our study. Platelets are believed to be active participants in the host defense, and the thrombocytopenia seenduring sepsis episodes may be caused, in part, by the consumption of platelets directly in these processes. They are capable of phagocytosis and can generate cytotoxic-free radicals and oxidative molecules when activated. In the present study, we have evaluated the relevance

of platelet count and platelet indices (MPV), in both term and preterm babies with sepsis. Platelets not only mediate hemostasis but also have an important role in linking innate and adaptive immune systems through the expression of Toll-like receptors.⁶⁻⁷ Lipopolysaccharide binds to platelets through Toll-like receptor 4, which is present on their surface, and, together with autoantibodies significantly enhances Fc-mediated platelet phagocytosis by mononuclear phagocytes.⁸⁻⁹ As endotoxemia is often accompanied by a microvascular inflammatory response¹⁰⁻¹¹ cytokines and bacterial lipopolysaccharide probably trigger this response through the activation of platelets, leukocytes or both. This microvascular inflammatory response could be responsible for the multiorgan failure that occurs with sepsis. The size of platelets can predict the risk for death in patients with sepsis. Preliminary data indicate that mean platelet volume (MPV) is an easily accessible prognostic marker of mortality in sepsis. Power of WBC count and HCT may be lower than that of MPV. Successful strategies to decrease sepsis should decrease neonatal mortality rates, shorten hospital stay, and reduce costs. Therefore, we studied platelet indices to see their usefulness in early detection of neonatal sepsis. A close relationship between sepsis and thrombocytopenia has been postulated in some studies. Also, neonatal sepsis due to Gram-negative organisms had significant difference in the number of neonates with thrombocytopenia, when compared with patients with Gram-positive sepsis. Moreover, some studies have determined a specific platelet response with different degrees of thrombocytopenia to different infectious agents, including gram positive/negative and fungal infections in preterm infants.¹² Low platelet count associated sepsis were seen in both types of sepsis caused by gram negative and gram positive microorganism, and account for 46% of all of cases of neonatal sepsis in our study. Our results indicate that platelet count was observed to decrease, but MPV increased in response to sepsis. These findings suggested that sepsis affects platelet count and platelet indices. Van der Lelie et al showed that MPV was elevated in 13 of the 25 septicemia patients, and returned to normal values as soon as the disease was under control.¹³ As stated earlier, one study showed that MPV falls as platelet count also decreases.¹⁴ Therefore, previous studies are inconclusive in regards to MPV and have shown any number of MPV change during sepsis (increase, decrease, and biphasic). However, there is still some controversy regarding its reliability, whether thrombocytopenia is suggestive of one (or more) causative agents of neonatal

sepsis as other studies have identified that thrombocytopenia might not be an organism-specific marker of sepsis.¹⁵ This may be explained by the fact that the mechanism of thrombocytopenia in septic neonates is believed to be multifactorial. Since, extensive endothelial injury, bacterial and fungal toxins, increased platelet activation, disseminated intravascular coagulation and limited response to thrombocytopenia through platelet production and thrombopoietin in preterm infants, all are thought to be responsible factors for thrombocytopenia in infants with sepsis.¹⁶⁻¹⁷ On the other hand, it was suggested that platelet consumption rather than decreased production is the major contributor to thrombocytopenia, as it was shown that bone marrow obtained from infants with necrotizing enterocolitis that correlated with sepsis proved normal megakaryocyte number and maturation.¹⁸⁻¹⁹ IL-6 and CRP are rapid acting acute phase proteins, and it is known that CRP increases 12 to 24 hours after the on-set of infection. It might be said that MPV is an accurate, safe and reliable marker for the diagnosis and follow up of neonatal sepsis. MPV may be used for predicting the severity of sepsis and death with a high sensitivity and specificity at the diagnosis of sepsis and may be a useful marker for early detection of severe sepsis and predicting mortality in neonates with sepsis. Therefore, MPV is quite simple, it may be better than the other markers like procalcitonin and C-reactive protein, because they may sometimes work and sometimes they don't." MPV might be more specific, and is quite cheap because the cell sorter already produces an MPV value.

In our study, MPV was more elevated in non-survivors. Our finding is similar with that of Akarsu's research in neonates with sepsis.²⁰ However, our results oppose the results of Farid et al's study of patients with sepsis with no relation between MPV and Mortality.²¹ The increase in mean platelet volume in septic thrombocytopenic neonates in our study had also been reported previously.³ There is a significant differences found in relation to platelet count and MPV and to the type of microorganism causing sepsis. Previous studies reported a significant difference in relation to certain types of pathogens.⁴ Similar results have been seen in our study with *Klebsiella pneumoniae* having maximum impact on platelet count and mean platelet volume. The platelet count and MPV was not different for different infectious agents (gram positive/negative and fungal infections) as found by ferhat et al.²² Additionally, they found high MPV may indicate the severity of sepsis, since non-survivors with sepsis had higher levels of MPV than survivors during sepsis episodes.²² Similar to our results. Further work is needed for a better understanding of the basis of the observed effects of different infectious organisms on platelet counts and platelet indices, in particular; the interactions among platelets, infectious organisms, and thrombopoietin in septic neonates need to be examined. *Klebsiella pneumoniae* expresses a smooth lipopolysaccharide (LPS with O antigen) and a capsular polysaccharide (K antigen), and both are important for its virulence. There is a variation in the genetic makeup of O antigen between

Klebsiella pneumoniae and other Gram-negative organisms, which allows *Klebsiella pneumoniae* strains to constitutively express a polysaccharide capsule critical for the organism's ability to resist complement-mediated opsonophagocytic killing.²³ These genetic variations in *Klebsiella pneumoniae* may be responsible for the persistent bacteremia and maximum effects on various platelet parameters, as seen in our study.

CONCLUSION

We concluded that low platelet count and high MPV were seen in both type of sepsis caused by gram negative microorganism and gram positive microorganism. There is statistical difference between these platelets response and the type of microorganism. Mean Platelet Volume can be used as early predictor of sepsis and outcome in neonates. Our study shows an organism-specific platelet response in thrombocytopenic babies with sepsis and the worst outcome for thrombocytopenic neonates with Gram-negative infections. We also conclude that increased MPV seen in severe thrombocytopenia is because of increased bone marrow production of immature platelets and thrombocytopenia is because of peripheral platelet destruction, not because of bone marrow suppression.

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Prediction of Six-Minute Walk Performance among Healthy North Indian Adult Males: The Influence of Obesity Indices

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ABSTRACT

Introduction: Six-minute walk test (6MWT) is an easy evaluation method for functional capacity and treatment efficacy. No universally acceptable standard predicting equation for the distance walked in 6MWT (6MWD) exists for Indians. Hence the study was an attempt in understanding significant predictors of 6MWD and influence of obesity indices on it.

Material and Methods: Physical activity (PAR); anthropometric variables like height (HT), weight (WT), including obesity indices like waist-hip ratio (WHR); resting heart rate and blood pressure (rHR and rBP); and 6MWD and heart rate recovery (HRR) were evaluated in 40 healthy adult North Indian males.

Results: 6MWD had significant negative correlation with age, WT, obesity indices, rHR and rBP; and positive correlation with HRR and PAR. Subjects with increased obesity indices had lower 6MWD and HRR, and higher rHR and rBP. Among the generated equations, $6MWD=10.52+6.06(HT)-2.4(WT)+26.87(PAR)-358.84(WHR)$ had the highest adjusted $R^2(96.23\%)$ with all the four predictors having significant unique contribution.

Conclusions: Subjects with increased obesity indices had lower 6MWD & HRR, and higher rHR & rBP. HT, WT, PAR and WHR were the significant predictors of 6MWD. Hence, decreasing weight and WHR, and increasing physical activity would result in improvement of six-minute walk performance.

Keywords: Six-minute walk distance, prediction equation, adiposity, heart rate recovery.

published predicting equations for 6MWD for normal population.⁹⁻¹¹ The relative paucity of such data in Indian scenario inspired us to conduct the present study, evaluating significant predictors of 6MWD in normal North Indian adult males.

MATERIALS AND METHODS

The present cross-sectional study was conducted under the Department of Physiology, Himalayan Institute of Medical Sciences, Swami Rama Himalayan University, Dehradun. Forty healthy males of 28-40 years with no history of addiction were the volunteers. The study was approved by the Institute ethical committee, and a well-informed written consent was taken from all the subjects.

Study Protocol

The subjects were requested to report in the department at around the same time in the morning after light breakfast. No tea, coffee or heavy physical activity was allowed for at least 2 hours before the reporting time. After taking medical and personal history, various anthropometric variables like heights (HT in cm) and body weights (WT in kg) were recorded. Physical activity recall questionnaire scale (PAR) was used to assess physical activity.¹² Obesity indices recorded were divided into:

- General obesity indices: body mass index (BMI in kg/m^2) and percentage body fat (%BF).¹³ An impedance body composition analyzer (Omron, model HBF-375) was used to measure %BF.
- Abdominal obesity indices: waist circumference (WC in cm) and waist-hip ratio (WHR).¹³ A flexible and non-stretching measuring tape was used to measure WC,

INTRODUCTION

Six-minute walk test (6MWT) is an easy, inexpensive sub-maximal test for functional capacity, which is safer, better tolerated and more reflective of activities of daily living as compared to other walk tests.¹ The distance walked in 6MWT (6MWD) has a very high correlation with formal measures of quality of life,² and is an independent predictor of both morbidity and mortality.³ Similarly heart rate recovery (HRR), which measures the rate of decline of heart rate following maximal or submaximal exercise to resting level,⁴ is also a powerful predictor of morbidity and all-cause mortality.⁵ Both 6MWD and HRR have been shown to affect negatively by obesity.^{6,7}

Since normative database on 6MWD is important in identifying extent of functional capacity alterations from normal and hence assessing treatment efficacy,⁸ many studies have

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HC (hip circumference in cm) as per WHO guidelines.¹⁴ WHR was calculated as WC:HC.

Heart rate (rHR in bpm) using a heart rate monitor (Polar FT1/FT2), and blood pressure (rSBP and rDBP in mmHg) using a blood pressure apparatus (model no. EW 254 DC6V) were measured after a rest of 10 minute in sitting position. 6MWT was conducted following the standard methodology, with constantly motivation throughout the testing.¹ After 6MWT, the distance walked (6MWD in m) was measured. HRR at 1st(HRR-1 in bpm) and 2nd(HRR-2 in bpm) minute after 6MWT was calculated by subtracting post 6MWT heart rate at 1st minute and 2nd minute from post 6MWT heart rate at 0th minute respectively with the subjects sitting passively. Polar heart rate monitor (Polar FT1/FT2) was used for the same.

STATISTICAL ANALYSIS

SPSS (Statistical Package for Social Science) version 19 was used for data analysis. For directly measured and derived variables, standard descriptive statistics were determined. Pearson's correlation was used to study association between 6MWD and various variables (Spearman's correlation, in case of ordinal variable). Unpaired t-test was used for comparison of interested parameters among the studied subgroups divided as per various obesity indices cut-off values. Various equations were generated for predicting 6MWD using multiple linear regression analysis, after avoiding multicollinearity and serial correlation, and such that most of the independent variables β -weights were significant. Semi-partial correlation R^2 was used to assess the effect of a particular independent variable above and beyond others on predicting 6MWD. Statistical significance was chosen at p-value (2-tailed) ≤ 0.05 .

RESULTS

Descriptive statistics of the studied subjects are given in Table 1.

6MWD was found to have significant negative correlation with all the obesity indices, apart from age, weight and resting cardiovascular variables. Although it had significant positive correlation with HRR-1, HRR-2 and PAR (Table 2). The negative effect of increased obesity indices on 6MWD was also evident from Table 3. When the subjects were grouped as per the obesity indices cut-off values: BMI: ≥ 23 Kg/m² and ≥ 25 Kg/m²,¹⁵ %BF: $>25\%$,¹⁶ WC: ≥ 90 cm and ≥ 102 cm and WHR: ≥ 0.9 ,¹⁴ the subgroups with lower obesity indices had higher 6MWD, in addition to higher HRR-1, HRR-2 and lower resting cardiovascular parameters, which were statistically significant, with few exceptions (Table 3).

Among all regression equations (Table 4), model (a) had the largest adjusted R^2 (96.54%). In this, WHR uniquely accounted only 1% of the total variance in 6MWD over and beyond those explained by HT, WT, PAR, HRR-2 and rHR. Among the equations having all the independent vari-

Parameters	Mean \pm SD	Min.-Max.
PAR	4.00 \pm .50#	2.00-4.00
Age (years)	36.95 \pm 3.84	28.00-40.00
Height (cm)	171.24 \pm 6.02	155.00-177.00
Weight (kg)	72.31 \pm 10.60	49.70-88.90
BMI (kg/m ²)	24.61 \pm 2.98	16.80-29.24
%Body Fat (%)	23.15 \pm 6.69	7.40-31.90
WC (cm)	99.14 \pm 6.97	82.60-108.00
WHR	.92 \pm .05	.86-1.09
rHR (bpm)	83.85 \pm 5.03	74.00-92.00
rSBP (mmHg)	124.90 \pm 5.78	110.00-134.00
rDBP (mmHg)	81.20 \pm 4.72	72.00-88.00
HRR-1 (bpm)	19.55 \pm 1.80	17.00-24.00
HRR-2 (bpm)	40.07 \pm 3.02	35.00-46.00
6MWD (m)	637.33 \pm 55.32	516.00-729.00
#Median \pm Quartile deviation; SD=Standard Deviation; Min.=Minimum; Max.=Maximum.		
Table-1: Descriptive Statistics of the studied subjects (n=40).		

Variables	6MWD (m)
PAR#	.74**
Age (years)	-.41**
Weight (kg)	-.53**
BMI (kg/m ²)	-.80**
%Body Fat (%)	-.85**
WC (cm)	-.73**
WHR	-.88**
rHR (bpm)	-.56**
rSBP (mmHg)	-.62**
rDBP (mmHg)	-.56**
HRR-1 (bpm)	.82**
HRR-2 (bpm)	.86**
Pearson's correlation.#Spearman's correlation.** p-value ≤ 0.01 :highly significant.	
Table-2: Significantly correlated variables with six-minute walk distance among the studied subjects (n=40).	

ables statistically significant (Table 4(d),(e) and (f)), model (d) had the largest adjusted R^2 (96.23%). In this also, only WHR among all the obesity indices was found included in the model with a uniquely contribution of 1.44% of the total variance (96.23%) in 6MWD over and beyond those contributed by HT, WT and PAR. However, in the equation with both general (%BF) and abdominal obesity indices (WHR), %BF contributed more unique variance out of the total variance (95.82%) in 6MWD than WHR (4% vs 1.44%), after controlling the overlapping effect of HT, PAR, WHR and each other (Table 4(e)).

In all the models, height uniquely accounted for the largest share of the total variance in 6MWD (exception: Table 4(g) and (h)), even though it was not a significant correlate of 6MWD (Table 2). This was followed by weight, except in Table 4(f) and (g); and PAR. Among the HRR variables, only HRR-2 was found included in the regression equations in which it contributed uniquely and significantly .36% and 1.44% of the total variance in 6MWD after controlling the overlapping effect of other independent variables, including

Cut-off		Parameters (Mean±SD)					
		6MWD (m)	HRR-1 (bpm)	HRR-2 (bpm)	rHR (bpm)	rSBP (mmHg)	rDBP (mmHg)
BMI (Kg/m ²)	≤22.9 (n=9)	694.33±31.71	21.44±1.81	43.33±1.73	80.89±3.79	121.33±7.21	79.78±5.70
	≥23 (n=31)	620.77±49.52	19.00±1.39	39.13±2.64	84.71±5.07	125.94±4.97	81.61±4.42
	p-value	<.001**	<.001**	<.001**	.04*	.03*	.31
	≤24.9 (n=17)	682.59±30.67	20.88±1.76	42.35±2.12	81.76±5.09	121.53±6.84	79.06±4.53
	≥25 (n=23)	603.87±44.59	18.57±1.04	38.39±2.44	85.39±4.49	127.39±3.16	82.78±4.30
p-value	<.001**	<.001**	<.001**	.02*	.004**	.01**	
%BF (%)	≤25 (n=22)	675.41±31.84	20.59±1.68	41.82±2.20	82.36±4.88	122.27±6.45	79.91±4.64
	>25 (n=18)	590.78±39.97	18.28±.89	37.94±2.51	85.67±4.72	128.11±2.32	82.78±4.45
	p-value	<.001**	<.001**	<.001**	.04*	.001**	.05*
WC (cm)	<90 (n=8)	701.38±25.28	21.50±1.93	43.50±1.77	80.25±3.49	121.00±7.63	79.75±6.09
	≥90 (n=32)	621.31±48.81	19.06±1.41	39.22±2.65	84.75±4.99	125.88±4.90	81.56±4.36
	p-value	<.001**	<.001**	<.001**	.02*	.03*	.34
	<102 (n=28)	660.86±39.79	20.14±1.72	41.18±2.36	83.00±5.16	123.71±6.10	80.07±4.63
	≥102 (n=12)	582.42±47.61	18.17±1.11	37.50±2.91	85.83±4.28	127.67±3.89	83.83±3.95
p-value	<.001**	.001**	<.001**	.1	.05*	.02*	
WHR	<0.9 (n=14)	690.71±26.13	21.36±1.60	43.00±1.66	80.71±4.36	120.29±6.74	78.71±4.81
	≥0.9 (n=26)	608.58±44.31	18.58±.95	38.50±2.34	85.54±4.60	127.38±3.19	82.54±4.18
	p-value	<.001**	<.001**	<.001**	.003**	.002**	.01**

Unpaired t-test. *p-value≤0.05:significant; **p-value≤0.01:highly significant.SD=Standard Deviation

Table-3: Comparison of six-minute walk distance, heart rate recovery, resting heart rate and blood pressure among the studied subjects based on various cut-off values of obesity indices.

Sl. No.	Regression equations	Adjusted R ² (%)	Semi-Partial correlation R ² (%) for significant predictors	F-value (df)	p-value
(a)	6MWD=-232.29+5.77(HT)-2.13(WT)+24.59(PAR)-299.81(WHR)+3.46(HRR-2)+1.05(rHR)	96.54	HT(12.96),WT(2.89), PAR(2.25),WHR(1), HRR-2(.36)	182.20** (6,33)	<.001
(b)	6MWD=-230.47+5.76(HT)-2.12(WT)+24.62(PAR)-299.98(WHR)+3.46(HRR-2)+1.05(rHR)-.03(Age)	96.43	HT(11.56),WT(2.56), PAR(2.25),WHR(1), HRR-2(.36)	151.46** (7,32)	<.001
(c)	6MWD=-37.73+5.84(HT)-2.26(WT)+24.42(PAR)-330.59(WHR)+1.46(HRR-2)	96.25	HT(12.96),WT(3.24), PAR(2.25),WHR(1.21)	201.15** (5,34)	<.001
(d)	6MWD=10.52+6.06(HT)-2.4(WT)+26.87(PAR)-358.84(WHR)	96.23	HT(16.81),WT(4.41), PAR(3.61),WHR(1.44)	249.65** (4,35)	<.001
(e)	6MWD=329.83+3.66(HT)-3.15(%BF)+25.77(PAR)-364.32(WHR)	95.82	HT(14.44),%BF(4), PAR(3.24),WHR(1.44)	224.46** (4,35)	<.001
(f)	6MWD=293.15+4.66(HT)-557.22(WHR)-1.61(WT)+4.43(HRR-2)	93.74	HT(10.89),WHR(4.41), WT(1.96),HRR-2(1.44)	147.05** (4,35)	<.001
(g)	6MWD=-421.21-5.57(WT)+8.31(HT)+1.01(Age)	78.41	WT(56.25),HT(47.61)	48.23** (3,36)	<.001
(h)	6MWD=429.66-5.67(Age)+2.44(HT)	20.06	Age(15.21)	5.89** (2,37)	.006

Multiple linear regression. ** p-value≤0.01:highly significant.df=degree of freedom.

Table-4: Regression models for predicting six-minute walk distance (m).

rHR (Table 4(a),(b) and (f)).

Hence, HT, WT and PAR were the most important significant variables for predicting 6MWD. The obesity indices (WHR and %BF) per se only contributed very small unique variance of the total variance in 6MWD.

DISCUSSION

Our study showed highly negative association of 6MWD

with obesity indices (Table 2), which was also reported earlier.⁶ Among the many causes of reduced 6MWD associated with increased adiposity include relative decrease in skeletal muscle strength and cardio-respiratory capacity, and increase in walking-gait inefficiency and prevalence of co-morbid conditions which might be hindrance to walking.¹⁷ In our study, only WHR and %BF were found as the significant predictors of 6MWD among all the obesity indices, even though the unique variances they contributed out of the to-

tal variance in 6MWD were relatively small (Table 4(a)-(f)). Instead the significant unique contribution of HT, WT and PAR were much higher (Table 4(a)-(g)). It is obvious from our study that decreasing weight, WHR and %BF would result in improving six-minute exercise performance (Table 4), and hence appropriate interventions should be directed in this regard.

There was also highly significant negative correlation of 6MWD with age, resting heart rate and blood pressure in our study (Table 2). Similar finding was also reported earlier.¹⁸ Our study also indicated that subjects with more obesity indices also had higher resting heart rate and blood pressure (Table 3). The association of higher resting heart rate and blood pressure with increased adiposity was reported earlier,¹⁹ and might be due to increase in sympathetic activity, total blood volume, cardiac output, peripheral vascular resistance and renin-angiotension-aldosterone activity.^{20,21}

In our study, those who reported higher physical activity, as indicated by PAR¹², were also found to have more 6MWD (Table 2 and 4). Hence increased involvement in regular physical activity and exercise is advised. There was also highly significant positive correlation between 6MWD and HRR variables (Table 2). Similar finding was reported earlier.²² Our study also showed that HRR-1 and HRR-2 were highly significantly lower among the studied subgroups with increased obesity indices (Table 3). The association of lower heart rate recovery with increased adiposity was also reported earlier.⁷

In our study, Table 4(d) regression model accounted for 96.23% of the total variance in 6MWD. All the predictors in this equation were statistically significant also. Earlier study in healthy North Indian adult males reported an equation with age and height as predictors, explaining 63.9% of total variance in 6MWD.⁹ Similar equation in our study had adjusted R² of only 20.06% (Table 4(h)). Similarly, another study in healthy Indians, reported a male specific equation with weight, height and age as predictors, having R² of 28.8%.¹⁰ Similar equation in western healthy adult males, accounting for 40% of the variance in 6MWD, was also reported.¹¹ In our study, the equation with weight, height and age accounted for 78.41% of the total variance in 6MWD (Table 4(g)). However, generalization of the regression equations generated in this study for obtaining non-exercise 6MWD for healthy North Indian adult males should be avoided. The sample size of our study was relatively less. Neither the sample was chosen randomly from all strata of the society or age or physical activity groups, nor other appropriate blinding method used to avoid bias. Our study was confined to an age group of 28-40 years, consisted only of males who performed regular modest physical activity of 10-30 min per week (PAR=2)¹² to heavy physical exercise of less than 30 min per week (PAR=4).¹² Nevertheless, our study did highlight important anthropometric and other predictors of six-minute exercise performance, and served the foundation

platform for future large scale study in this field which addressed our shortcomings.

CONCLUSION

6MWD had significant negative correlation with age, weight, obesity indices, resting heart rate and blood pressure; and positive correlation with heart rate recovery and physical activity. Among the subjects, those who were having increased obesity indices had lower 6MWD, heart rate recovery; and higher resting heart rate and blood pressure. The equation $6MWD=10.52+6.06(HT)-2.4(WT)+26.87(PAR)-358.84(WHR)$ accounted for 96.23% of the total variance in 6MWD.

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Role of Computed Tomography and Magnetic Resonance Imaging in Orbital Tumors with Histopathological Correlation

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ABSTRACT

Introduction: CT and MRI when performed separately or in combination, will complement each other and provide exact diagnosis. Aim of the study was to evaluate efficacy of CT in orbital tumors and role of MRI to assess the nature, anatomical extent, morphology and aid in decision making for choice of treatment, and to correlate with histopathological diagnosis.

Materials and methods: It is a prospective study of CT and MRI evaluation of Orbital tumors with histopathological correlation was conducted on 35 patients with a suspicion of having orbital lesion.

Results: 17 were male and 18 were female patients. Mild female preponderance is seen with Maximum number of the patients was under 9 years. Proptosis is the most common clinical presentation noted in 26 cases (74.3%). The most common tumor in the adult age group was Optic nerve meningioma and in the pediatric group was retinoblastoma, MRI can better differentiate the pseudotumor from lymphoma, by showing the involvement of tendinous part of extraocular muscles, orbital fat stranding and reactive inflammation of sclera. In all the tumors, involving the optic nerve, MRI clearly showed the extent of the lesion and morphology. Except in one case, diagnosis in all the other cases was correlating with histopathological diagnosis.

Conclusion: CT and MRI when performed in combination will complement each other and provide correct diagnosis. MRI was superior to access nature, anatomical extent and morphology. Diffusion weighted image and apparent diffusion coefficient offer a useful additional parameter that can differentiate malignant tumours from benign lesions with high sensitivity and specificity.

Key words: Diffusion-weighted imaging, Apparent diffusion coefficient, Orbital tumors

lesion and intracranial extension.¹ Extra orbital diseases involving the orbit are also well delineated.

CT provides quicker scans, is able to image bone directly, and shows the presence of calcification better. Multidetector CT is now able to provide isotropic multiplanar imaging which has increased its ability to localize the site of orbital lesions.

MRI has advantages over CT in its superior soft tissue contrast, its ability to image the orbit and intracranial structures free of beam hardening artefacts from the skull base, dental fillings, and its lack of ionizing radiation. Selection of appropriate MRI imaging protocols and use of the correct surface coils is important depending on clinical question.² Use of gadolinium contrast enhancement and fat suppression aids in disease detection and characterization.

Hence this study is done to evaluate efficacy of CT in orbital tumors and role of MRI to assess the nature, anatomical extent, morphology and aid in decision making for choice of treatment, and to correlate with histopathological diagnosis

MATERIALS AND METHODS

This prospective study of CT and MRI evaluation of Orbital tumors with histopathological correlation was conducted on 35 patients at Osmania General Hospital/Osmania Medical College, Hyderabad and also patients referred from Sarojini Devi Eye Hospital, which is attached to our hospital, with a suspicion of having orbital lesion.

Inclusion Criteria

Patients who presented with proptosis, white reflex or mass around the orbits or clinically, fundoscopically suspected to have intraocular or retrobulbar lesion were selected and studied.

The patients included in the study had complaints of pain in

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INTRODUCTION

Diagnosis of orbital lesions is often not clear even after thorough clinical examination. In earlier era this dilemma would necessitate an exploratory orbitotomy in order to determine the diagnosis. With advent of CT and MRI, these have become the procedures of choice in arriving at a diagnosis. The clarity of presentation of orbital structures by CT and MRI have prompted investigations into detailed multiplanar anatomy of orbit. Tumor margins and inflammatory processes are so clearly needed that one can place the lesion in specific compartments and accurately determine the extent of the

the eye, redness of eye, proptosis, white reex and restriction of ocular movements.

Exclusion Criteria

Patients with recent history of trauma, patients with presence of foreign body, patients with claustrophobia and patients having metal implants are excluded from the study. A detailed history was taken from each patient followed by clinical examination and findings were tabulated. Basic investigations like blood and urine analysis were done in all patients.

Patient Preparation

All patients were advised at least three hours of fasting prior to the examination, Children who were not cooperative were sedated by giving oral Phenergan or IV diazepam. A thorough clinical examination was done with particular attention to the lesion in orbit. Contrast studies performed by injecting 60% or 76% Urograffin calculated at a dose of 300mg/kg body weight as a single bolus injection.

Imaging

Computed Tomography imaging was performed and following were used. Kilovoltage 120kv, Tube current 150Ma axial and coronal thin sections of 3mm slice thickness with no interslice gap were taken, FOV 25cm, matrix 512 _ 512. Omnipaque contrast media was for contrast enhanced scans. MRI was performed on a 1.5 Tesla electromagnet (GE Company). The primary pulse sequences included T1 and T2WI using spin echo and gradient echo techniques. T1 weighted images were obtained with a TR of 600 msec. and TE of 30msec. T2W1 were obtained with a TR of 2740msec. and TE of 85msec. Images were obtained with a multislice technique using a slice thickness of 5mm, interslice gap of 6mm, FOV of 220 240mm and a matrix size of 512 _ 512.

MRI Orbit Protocol

- Coronal STIR Orbits
- Coronal T2/T1 Fat Saturated Orbits
- Axial T2 Fat Saturated Orbits
- Axial T1 Orbits
- Sagittal T2 Fat Sat orbits (Parallel to optic nerve)

POST CONTRAST \MRI Orbit Protocol"

- POST axial T1 Brain
- POST coronal T1 Fat Sat
- POST axial T1 Orbits

Majority of these patients underwent surgery and their histopathology report was taken. The imaging morphology was correlated with histopathological features.

Image Analysis

On the basis of involvement of globe, intraconal or extra-

conal or arising from muscle/ from orbital wall, expansion of bony orbit, destruction of bone, calcification, attenuation, extension of the lesion and enhancement, the tumors are characterized.

RESULTS

The study Role of Computed Tomography and Magnetic Resonance Imaging in the evaluation of Orbital tumors with histopathological correlation was conducted on 35 patients. of 35 patients, 17 were male and 18 were female. Slight female preponderance is seen in my study. Age of patients range from 2 years to 70 years. More number of patients lie in 0-9 year group than in any other age group. Out of 35 cases, most common tumor in the adult age group was Optic nerve Meningioma (6 cases), followed by Pseudotumor (4 cases), cavernous hemangioma (2 cases), lymphoma (2 cases), Vascular malformations (2 cases), frontal mucocele (1 case, which is mimicking like a primary orbital

Age	Males	Females
0-9	3	6
10-19	3	4
20-29	0	0
30-39	1	5
40-49	2	2
50-59	5	1
60-69	2	0
70-79	1	0

Table-1: Demographic distribution

Diagnosis	Number of Cases
Cavernous Hemangioma	2
Retinoblastoma	4
Capillary Hemangioma	3
Pseudotumor	4
Lymphoma	2
Epidermoid	1
Optic Nerve Meningioma	6
Optic Nerve Glioma	3
Schwannoma	1
Rhabdomyosarcoma	3
Venolymphatic Malformation	2
Metastasis	1
Mucocele	1
Melanoma of Choroid	1
Lacrimal gland tumor	1
Clinical Picture	
Proptosis	26
Defective Vision	20
Diplopia	4
Motility Disturbance	5
Pain	11
Signs of Inflammation	9
White Reflex	4

Table-2: CT and MRI Diagnosis

	Benign	Malignant
Extraocular Musclce Involvement		
Present	7	6
Absent	16	6
Optic Nerve Involvement		
Present	9	7
Absent	14	5
Bone Changes		
Present	2	5
Absent	21	7
Calcification		
Present	2	4
Absent	21	8

Table-3: Involvement of other sites

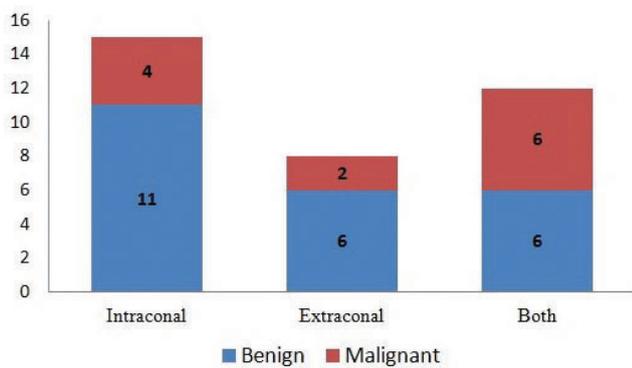


Figure-1: Location of tumor

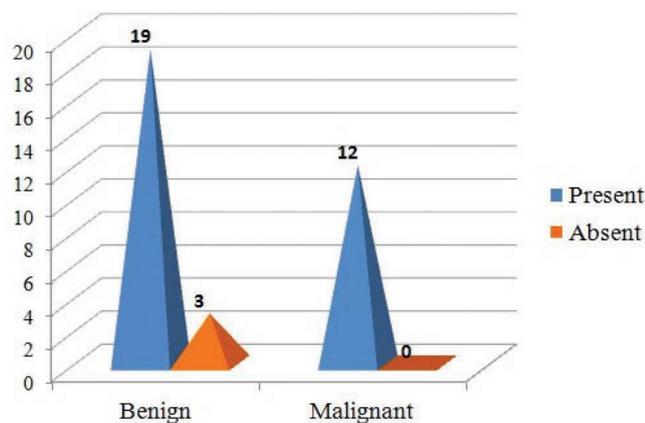


Figure-2: Contrast Enhancement

tumor, resulting in severe proptosis), malignant melanoma of choroid(1 case), lacrimal gland mixedtumor(1 case) and 1 case of schwannoma. In the paediatric age group, cases with Retinoblastoma (4 cases) were maximum in number followed by capillaryhemangioma (3 cases), optic nerve gliomas(3 cases), Rhabdomyosarcomas (3 cases), 1 case of epidemoid and 1 case of orbital metastasis fromEwing’s sarcoma of left tibia. Majority of the patients (26 patients) presented with proptosis

Out of 35 cases, 23 cases were of benign tumors and 12 cases were of malignant tumors. In benign cases, 6 cases were extraconal, 11 cases were intraconal and 6 cases were both

intraconal and extraconal in location. In malignant cases, 2 cases wereextraconal, 4 cases were intraconal and 6 cases were both intraconal andextraconal in location.

9 cases with benign lesions, 7 cases with malignant lesions are showing optic nerve involvement. Bone changes are observed in 2 cases with benign tumors and in 5 cases with malignanttumors.

7 cases with benign lesions, 6 cases with malignant lesions are showing extraocular muscle involvement. Calci_ cation is observed in 4 cases with malignant lesions, 2 cases withbenign lesions. All cases with malignant tumors, 20 cases with benign tumors show Contrast enhancement.

DISCUSSION

Wide varieties of tumors are known to occur in the orbit. Vascular, lymphoid, nervous, and mesenchymal structures are all normally found within the orbit and may give rise to primary orbital tumors. Primary lacrimal gland tumors of lymphoid and epithelial cell origin also cause orbital masslesions. Orbital tumors are comparatively rare, constituting only about one percent of the cases among the patients admitted to the eye departments.

The study was done on 35 patients of whom contrast was given in 34. Orbital tumors were analyzed based on clinical, ophthalmologic and Computed tomography, Magnetic resonance imaging. Patients presented with proptosis, suspected to have orbital mass were included in the study. Surgery was done in required patients and correlated with histopathological diagnosis.

In our study, the age group of patients ranges from 2 to 70 years. 17 were male and 18 were female patients. Mild female preponderance is seen in my study. More number of patients lie in 0-9 year group than in any other age group. Proptosis is the most common clinical presentation observed in 26 cases. This is comparable to the study of Simona Dunarintu et al³ in which exophthalmia was the most important clinical symptom found in 95 cases (62.91%) also correlates with previous studies.⁴

The most common tumor in the adult age group in our study was Optic nerve meningioma (6 cases), with a female to male ratio 3:2. The age range is 30-40 years. All of the patients underwent surgery. One case showed peripheral calcification. This is comparable to the study of Wilson and Grossniklaus⁵, reviewed around 4,563 cases of orbital lesions and the most common tumor in their study was meningioma followed by cavernous hemangioma, lymphoma. Simona Dunarintu et al³ studied 151 patients with age between 1-82 years. They classified of the orbital tumors into primitive orbital tumors 114 (75.49%), propagated secondary orbital tumors 33(21.95%) and secondary metastatic orbital tumors 4 (2.64%). The most frequent histopathological type of primitive orbital tumors in their study was meningiomas (14.56%).

We have encountered 4 cases of Pseudotumor, patients of the age above 50 years with female to male ratio 1:3. One case

had history of trauma and three cases are of idiopathic etiology. All the four cases showed involvement of extraocular muscles with its tendinous part and orbital fat stranding. This is supported by Guy J. Ben Simon et al.⁶ study that orbital fat involvement and fat stranding was noticed only in inflammatory lesions. Diffusion weighted imaging has an important role in differentiating between inflammatory and malignant lesions. Diffusion restriction is usually seen in malignant lesions but not seen in inflammatory lesions. One case of Pseudotumor is showing restriction on diffusion weighted imaging. This is correlated with the study done by Roshdy N et al.⁷ For one case, we performed ultrasound guided FNAC which is in favor of pseudotumor. All patients responded good with steroids and were in continuous follow up.

Cavernous hemangioma was diagnosed in two male patients with age between 45 to 50 years. The study by Alfred and Char et al⁸ found that 70% of their patients with cavernous hemangiomas were women with a mean age of 41 years at the time of diagnosis. Our cases showed no restriction on diffusion weighted imaging in both the cases. This is in contradiction to the study done by Roshdy N et al⁷ (2010) in which they noticed diffusion restriction in one case.

One case of lymphoma was diagnosed in male patient of age 50 years. The patient underwent surgery and was advised chemotherapy. Imaging showed round lobulated mass, molding to adjacent structures, and a wedge shaped enlargement of the lacrimal gland. Both of them were isointense on T2 WI. This is supported by the study done by Polito et al.⁹ One case of Lymphoma misdiagnosed as Pseudotumor on imaging which was showing restriction on diffusion weighted imaging.

One case of schwannoma was diagnosed in a 17 year female patient, and showed bone remodeling which is better depicted on CT. MRI clearly delineated superior rectus muscle separate from the lesion. Two cases of venolymphatic malformations were diagnosed in 30- 35 year females which is uncommon in this age group. One patient had both superficial and deep components. She had recurrence because of presence of both the components. This is supported by the study done by Root man et al.¹⁰

One case of frontal mucocele was diagnosed in a 70 year male with proptosis mimicking orbital tumor. Sinus expansion was noted and signal is hyperintense on T1, isointense on T2 WI due to mucinous content. This is the only case of para orbital mass extending into orbit which we have come across. One case of malignant melanoma of choroid was diagnosed in 48 year female which is hyperintense on T1, hypointense on T2WI. One case of lacrimal mass diagnosed as mucoepidermoid carcinoma based on calcifications and bony changes later proven to be mixed malignant tumor on histopathology.

Among pediatric tumors, most common tumor was retinoblastoma. 4 cases were seen in patients with age less than 5 years. This finding is identical to the study done by SushmaVashisht et al.¹¹ One case showed bilateral involvement,

one case showed infiltration of optic nerve and extension up to suprasellar region, two cases are unilateral in presentation. All of these showed calcification, a unique feature of retinoblastoma, and are depicted well on CT. The extent of Optic Nerve Involvement is better demonstrated on MRI.

Three cases of capillary hemangioma were diagnosed in female children of age below 10 years. After a period of observation, two of them showed gradual regression of the tumor. One case lost follow up. Three cases of rhabdomyosarcoma were diagnosed in patients of age between 4 and 12 years with female to male ratio 2:1. Bone involvement was noticed in all cases.

Optic nerve gliomas diagnosed in 3 male children of age below 10 years. Histopathology revealed grade 1 stage in two cases and grade 2 stage in one case. One case of epidermoid cyst of lateral orbital wall detected in a 11 year old boy. It is showing restricted diffusion on DWI. One case of metastasis from Ewing's sarcoma of tibia detected in 11 year old female. Bone destruction with intracranial extension is observed with large soft tissue component.

Out of 35, 23 cases were benign, in which 19 cases did not show restriction on DWI. 12 cases were malignant and all of them showed restriction. This is identical to the study done by Roshdy N et al⁷, who studied twenty patients with orbital soft tissue masses. Histopathologically, 14 cases had benign lesions whereas the remaining six had malignant lesions. On DWIs, 57% of benign lesions appeared hypointense indicating free diffusion. All (100%) malignant tumors appeared hyperintense indicating restricted diffusion and showed low ADC values.

CONCLUSION

In our study the age group includes from 2 to 70 years. 17 were male and 18 were female patients. Mild female preponderance is seen in my study. Maximum number of the patients was under 9 years. Proptosis is the most common clinical presentation noted in 26 cases (74.3%). The most common tumor in the adult age group was Optic nerve meningioma and in the pediatric group was retinoblastoma, MRI can better differentiate the pseudotumor from lymphoma, by showing the involvement of tendinous part of extraocular muscles, orbital fat stranding and reactive inflammation of sclera. In all the tumors, involving the optic nerve, MRI clearly showed the extent of the lesion and morphology. Except in one case, diagnosis in all the other cases was correlating with histopathological diagnosis. DWI (diffusion-weighted imaging) and ADC offer a useful, reliable, safe and non-invasive imaging parameter that can be used for the differentiation of malignant tumors from benign lesions with high sensitivity and specificity.

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A Study of the Spectrum of Congenital Malformations in Neonates Admitted in the Neonatal Unit of the Pediatric Department of Government Medical College Srinagar

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ABSTRACT

Introduction: Congenital abnormalities play a major role in mortality and morbidity of children. The treatment and rehabilitation of these children can be very costly, hence the need to identify the causative and risk factors and prevent them early wherever possible. Objectives of the study were to study the spectrum of congenital abnormalities in neonates admitted in the special newborn care unit and to identify any risk factors associated with the occurrence of these abnormalities

Material and method: This was a prospective observational study conducted in the Pediatric Department of Govt Medical College Srinagar. The diagnosis of congenital abnormality was based on a detailed physical examination and relevant investigations. A detailed history including the antenatal history and possible risk factors, was sought on a pre designed proforma.

Results: Out of 4987 admissions during the study period 145 neonates had one or more congenital abnormalities. Musculoskeletal system defects accounted for majority of the cases 20.8% (n=41), followed by GIT 17.7% (n=35), CVS 16.75% (n=33), genitourinary 10.65% (n=21), CNS 8.1% (n=16) and others 16.24% (n=32). Congenital anomalies were more common in males, premature and low birth weight babies and babies born to mothers >30 years of age.

Conclusion: Musculoskeletal system was most commonly affected in our study. Prematurity, LBW, male gender, advanced maternal age were associated risk factors for congenital malformation in neonates.

Keywords: Congenital anomaly, risk factors, newborns, genetic, environmental, multi-factorial

gestation) is the vital period of life for the normal development of organs. Any insult within that period may result in congenital abnormalities. It can further be argued that interventions within this period targeted at preventing insults (or removing the effect of insults) to the developing foetus will reduce the likelihood of an abnormality developing. For instance, it is known that folic acid supplementation helps in the prevention of neural tube defects especially in the first trimester. It is however observed that better maternal care and improved standards of living have little effect on the overall frequency of congenital malformations^{4,5}

Congenital abnormalities can be classified into four descriptive categories on the basis of, location into external or internal birth defects, health impact into major or minor birth defects, clinical presentation into isolated or multiple birth defects and on the basis of pathogenesis into malformations, deformations, disruptions and dysplasias.

Congenital abnormalities play a major role in mortality and morbidity of children. However the treatment and rehabilitation of these children can be very costly, hence the need to identify the causative and risk factors and prevent them early wherever possible. The birth of an infant with major malformations whether diagnosed antenatally or not evokes an emotional parental response. Early recognition of anomalies is important for planning and care. Parents are likely to feel anxiety and guilt on learning of the existence of a congenital anomaly in the child and require sensitive counselling.

Prevalent studies of congenital anomalies are useful to establish baseline rates, to document changes over time and to identify clues to etiology. They are also important for health services planning and evaluating antenatal screening in populations with high risk. The study is also important as it may help to raise the awareness of surgical pediatric intervention and to emphasize the loss of babies with congenital abnor-

INTRODUCTION

Birth defects are abnormalities of body structure or function that occur during intrauterine life, can be identified prenatally, at birth or later. Sometimes also called as Congenital anomalies, Congenital abnormalities or Congenital malformations.¹ The etiology of congenital abnormality may be genetic (30-40%) or environmental (5-10%). Among the genetic causes chromosomal abnormality makes upto about 6%, single gene disorders about 7.5% and multifactorial factors 20-30%. In about 50% of cases, the cause is not known.^{2,3} Early intrauterine period (between the 3rd and 8th week of

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malities.

We are not aware of any study of this nature from Kashmir province in general. In addition since no work has been done on the pattern of presentation of congenital abnormalities in newborns in the area, this study [A hospital based prospective study of the spectrum of congenital abnormalities among neonates of Kashmir province admitted in neonatal unit] was designed to bridge this gap. It was hoped that this would add to the body of knowledge available on these disorders and may stimulate further research in the area on this subject.

Aims and objectives of the study were to study the spectrum of congenital abnormalities seen among the neonates admitted in the special newborn care unit and to determine the various birth and maternal characteristics and to identify any risk factors which may be associated with the occurrence of these abnormalities.

MATERIALS AND METHODS

This study [A hospital based prospective observational study of spectrum of congenital abnormalities among neonates of Kashmir province admitted in neonatal unit] was conducted over a period of one year from 1st April 2013 to 31 March 2014 in the special newborn care unit of the Pediatric Department of Government Medical College Srinagar. All the neonates admitted were included in the study. The diagnosis of congenital abnormality was based on a detailed physical examination of the neurological, cardiovascular, respiratory, abdominal and musculoskeletal systems along with relevant investigations e.g X-Ray chest/abdomen for diaphragmatic hernia, ultrasound examination for renal abnormalities, echocardiography for congenital heart disease and karyotyping for chromosomal disorders (wherever indicated).

A detailed history including the antenatal history, history of exposure to teratogens/drugs, history of consanguinity, maternal age, parity, type of delivery, gestational age, maternal illness and congenital abnormality was sought on a pre designed proforma. The congenital anomalies were classified according to the International Statistical Classification of Diseases and Related Health Problems 10th Revision⁶

Multiple congenital anomalies were grouped depending upon whether those anomalies qualified as a specific syndrome or not. If they qualified as a specific syndrome they were categorized into that syndrome. If two systems were involved, both systems were recorded. When multiple anomalies of a system were present, they were counted as separate.

RESULTS

Out of 4987 admissions during the study period 145 neonates had one or more congenital abnormalities. Out of these 109 had a single anomaly and 36 had multiple anomalies. Musculoskeletal system defects accounted for majority of the cases 20.8% (n=41), followed by gastrointestinal 17.7% (n=35), CVS 16.75% (n=33), genitourinary 10.65% (n=21),

CNS 8.1% (n=16) and others 16.24% (n=32).

Among the musculoskeletal abnormalities CTEV was the most common malformation (n=21). In the GIT cleft palate was most common (n=15). VSD was the most common cardiovascular anomaly (n=13). In the genitourinary system ambiguous genitalia were most frequent (n=10) and in the nervous system congenital hydrocephalus was most common (n=5).

Among the syndromes Down Syndrome was predominant (n=15), followed by Pierre Robin Sequence (n=7).

MUSCULOSKELETAL/Q65-Q79/41

Congenital Malformation	ICD Code	Number
CTEV	Q66	17
POLYDACTYLY	Q69	8
SYNDACTYLY	Q70.9	4
AMC	Q74.3	1
LIMB REDUCTION	Q71	2
DDAO	Q79.9	2
FACIAL ASYMMETRY	Q67.0	1
CDH	Q79	2

GASTROINTESTINAL/Q35-Q45/35

CLEFT PALATE	Q35	15
CLEFT LIP	Q36	12
TEF	Q39.1	2
CHPS	Q40	2
Imperforate anus	Q42.3	1
INGUINAL HERNIA	Q45.9	2
MACROGLOSSIA	Q38.2	1

CIRCULATORY/Q20-Q28/33

VSD	Q21	13
PDA	Q25	4
DTGA	Q20.3	4
TOF	Q21.3	3
ASD	Q21.1	3
AV canal defect	Q21.2	2
TAPVC	Q26.2	2
HLHS	Q23.4	1
TRICUSPID ATRESIA	Q22.4	1

NERVOUS SYSTEM/Q00-Q07/16

CONG. HYDROCEPHALUS	Q03	5
MENINGOCELE	Q05	4
MICROCEPHALY	Q02	4
ANENCEPHALY	Q00	1
CHOROID PLEXUS CYST	Q04.6	1
ENCEPHALOCELE	Q01	1

GENITOURINARY/Q50-Q64/21

AMBIGUOUS GENITALIA	Q52/55	11
UNDESCENDED TESTIS	Q53	6
HYPOSPADIAS	Q54	3
RENAL AGENESIS (u/l)	Q60	1

EYE EAR FACE NECK/Q10-Q18/19

MICROOPHTHALMIA	Q11.2	2
CONGENITAL ECTROPION	Q10.1	2
PRE AURICULAR TAG	Q17	8
MICROTIA	Q17.2	2
LOW SET EARS	Q17.4	5

OTHERS/SYNDROMES/Q80-99/32

DOWNS SYNDROME	Q90	15
EDWARDS SYNDROME	Q91	1
THORACOPHAGUS	Q99	1
APERT SYNDROME	Q87	1
LAMELLAR ICTHYOSIS	Q80.2	5
HEMANGIOMA	Q82.5	2
PIERREROBIN Sequence	Q87	7

Among 145 neonates 89/61.37% were males and 56/38.62% were females. LBW neonates were 85 (58.62%) and further distribution in weight category revealed that 51 (35.17%) were between 2.5kg to 4kg and 9 (6.2%)>4kg. Regarding gestational age, 76 (52.41%) were preterm, 55 (37.93%) full-term and 14 (9.65) post-term. Besides, 84 (57.93%) neonates were born by lowersection Caesarean Section (LSCS) and 61 (42.06%) by simple vaginal delivery (SVD). Maternal age parameters revealed that 64 (44.13%) mothers were above 30 years, 24 (16.55%) 25-30 years, 20 (13.79%) 20-25 years, and 37 (25.51%) below 20 years.

DISCUSSION

Prevalence rate of Congenital Malformations in our study was 2.9%. True prevalence of Congenital Malformations depends upon many factors like place of study nature of sample, ethnicity, geographical distribution and socioeconomic status. That is why, any two studies are never comparable in the strict sense of the term. Worldwide it is 3-7% but varies from country to country, prevalence from Nigeria⁷ has been reported as 2.7%, Oman⁸ 2.46%, Bahrain⁹ 2.7% and India¹⁰ 1.5%.

In this study, the most common system involved was the musculoskeletal system (20.8%), GIT (17.7%), CVS (16.7%). These findings were comparable to the studies conducted by other investigators in India, Kuwait¹¹, Saudi Arabia¹² and Iran.^{13,14,15} Some studies, however, recorded a higher incidence of CNS and CVS malformations followed by GIT and musculoskeletal system.¹⁶

In our study, the rate of CMs outnumbered in males compared to females and was consistent with a study from Brazil (59 % male and 41% in females).^{17,18} Another study In India also reported that CMs were more common in males than females (2.1:1 ratio). It was also consistent with results of other studies.

The incidence of CMs in our study was higher in pre-term babies compared to the full-term ones. It represented the Phenomenon of Nature's Selection and was consistent with results of a study from Brazil (67% pre-term and 33% term)¹⁷,

and others but in contrast with another study which reported tendency of anomalies more common in Pakistan in term neonates.¹⁹

Association of LBW with increased incidence of anomalies was found in our study and was in accordance with result of other studies in Saudi Arabia, India[20, 21]. We also had LSCS preponderance as the mode of delivery which was consistent with earlier results.

Maternal age's association with congenital anomalies is considered an important factor. Our study revealed that mothers above 30 years of age had high incidence of producing malformed babies. It was in accordance with earlier studies. One Pakistani study has reported the highest (80.6%) incidence in 20-40 years age group.

High incidence of CM among gravida 2 or more than primi-gravida was reported by our study and was similar to earlier reports. It indicates that the incidence of CM increases as the birth order increases. Likewise H/O maternal illness was associated with congenital anomalies in 54.4% of neonates and this association is well supported by studies done earlier. Folic acid supplementation was absent in 13 cases, among them one was a case of meningocele. None of the mothers was a smoker nor was their h/o alcohol intake during pregnancy

LIMITATIONS

In terms of limitations, the current study was based on a hospital neonatal unit and, as such, is not representative of the situation in the community at large. Besides, the hospital did not have paediatric neurosurgical facilities and many cases of CNS/surgical are likely to have been missed.

CONCLUSION

CMs are not rare in our set-up and MS was the most commonly affected system in our study. Prematurity, LBW, male gender, , advanced maternal age were associated risk factors for CMs in neonates. Knowledge of incidence and pattern of CMs are important to plan preventive strategies at different levels by healthcare providers for better outcome of these neonates

ABBREVIATIONS

ASD	Atrial septal defect
AMC	Arthrogryposis multiplex congenita
CDH	Congenital diaphragmatic hernia
CHPS	Congenital hypertrophic pyloric stenosis
CM	Congenital Malformation
CNS	Central nervous system
CTEV	Congenital talipesequinovarus
CVS	Cardiovascular system
DDAO	Deficiency of Depressor AnguliOris
DTGA	Dextro transposition of great arteries

GIT	Gastrointestinal tract
HLHS	Hypoplastic left heart syndrome
ICD	International classification of diseases
LBW	Low birth weight
LSCS	Lower segment caesarian section
PDA	Patent ductus arteriosus
SGA	Small for gestational age
TAPVC	Total anomalous pulmonary venous connection
TEF	Tracheoesophageal fistula
TOF	Tetrology of Fallot
VSD	Ventricular septal defect

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Comparative Assessment of the Effectiveness and Safety of Sertaconazole Cream Versus Terbinafine Cream Versus Luiliconazole Versus Clotrimazolecream in Patients with Tineacurris

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ABSTRACT

Introduction: Dermatophytosis is an infection of keratinized tissues, epidermis and its appendages hair and nails. Topical treatment of dermatophytosis has advantages like targeting the site of infection which minimizes systemic side effects, and enhanced efficacy of treatment. Topical therapy is also considered to improve patient compliance. So to assess the effectiveness and safety of sertaconazole cream versus terbinafine Cream versus luliconazole versus clotrimazolecream in patients with a form of dermatophytosis i.e. tineacurris (dermatophytosis of groin and adjacent areas).

Material and Method: A randomized, open-label, cohort study was performed over a period of 18 months, from January 2014 to June 2015.

Results: The study was continued till 30 participants in each group were available for analysis; a study population of 120 participants was achieved. Age group obtained in this study was indeed ranged from 18 years to 50 years. There were 64 (53.3%) males and 56 (46.7%) female participants in this study. The participants were randomized into four study groups: (A) Sertaconazole, (B) Luliconazole, (C) Terbinafine, (D) Clotrimazole.

Conclusion: Response to the topical monotherapy with and sertaconazole 2%, luliconazole 1%, terbinafine 1% and clotrimazole 1% cream was safe and well tolerated in the treatment of tineacurris. Treatment with sertaconazole 2% cream and luliconazole 1% cream was early in the onset with tolerable side-effects.

Keywords: Dermatophytosis; tineacurris; sertaconazole; luliconazole; terbinafine; clotrimazole; effectiveness.

close to 25% of world's population, making them most frequent form of infection.² Also, these infections are common in tropics and may reach epidemic proportions in geographical areas with hot and humid climatic condition, or with population overload, or with living conditions characterized by poor hygiene.^{3,4} Topical treatment of dermatophytosis has advantages like targeting the site of infection which minimizes systemic side effects, and enhanced efficacy of treatment. Topical therapy is also considered to improve patient compliance.⁵

Commonly available topical antifungals are Allylamines (Terbinafine), Imidazoles (Bifonazole, Clotrimazole, Econazole, Ketoconazole, Miconazole, Sertaconazole, Tioconazole, luliconazole), Morpholine derivative (Amorolfine HCl), Polyenes (Nystatin, Amphotericin B, Natamycin), Pyridone derivative (Ciclopiroxolamine) and Thiocarbamate (Tolnaftate).⁶

In our setting clotrimazole, terbinafine, sertaconazole and luliconazole are most commonly used topical antifungal agents. So a study was planned to compare relative efficacy of these four agents when given as single topical therapy.

Clotrimazole blocks sterol synthesis by interfering cytochrome p-450 dependent enzyme, lanosterol 14 α -demethylase which catalyses conversion of lanosterol to ergosterol. Clotrimazole is well tolerated drug, with isolated reports of erythema, burning, irritation, stinging, peeling, blistering, edema, pruritus and urticaria at the site of application.⁶

Terbinafine is an allylamine which inhibit the enzyme squalene epoxidase, one of the steps in synthesis of ergosterol. It is well tolerated drugs; rarely pruritus, irritation, burning, tingling, dryness at the site of application have been reported.⁶

INTRODUCTION

Dermatophytosis is an infection of keratinized tissues, epidermis and its appendages hair and nails. Mycotic agents belonging to three genera, *Epidermophyton*, *Microsporum* and *Trichophyton* are implicated in dermatophytosis. The dermatophytosis causes superficial infections because they produce keratinases, which degrade the keratin and thus are restricted to part of skin containing this protein. These infections are also known by misnomer 'tinea infections'.¹ The prevalence of fungal infections of skin has increased rapidly, affecting approximately 40 million people across the globe; prevalence of dermatophytosis has been estimated to affect

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Sertaconazole induces inhibition of 14α -demethylase and also binds to nonsterol cell membrane lipid, leading to altered membrane permeability and leakage of intracellular content. Sertaconazole has excellent safety records, however rare cases of allergic contact dermatitis have been reported.⁶ Luliconazole belongs to azole class, inhibits lanosterol demethylase finally decrease fungal cell wall component ergosterol. Side effects are very rare comparable to placebo. Pruritus, burning, tingling at the site of application have been reported.⁶

Objectives

Comparative assessment of the effectiveness and safety of sertaconazole cream versus terbinafine Cream versus luliconazole versus clotrimazole cream in patients with tinea cruris.

METHOD AND MATERIAL

A randomized, open-label, cohort study was performed at Out-Patient facility of Department of Dermatology, Venereology and Leprosy of Mahatma Gandhi Memorial Medical College and associated Maharaja YashwantRaoHolkar Hospital, Indore, India; over a period of 18 months, from January 2014 to June 2015.

Study protocol was approved by Institutional Ethics Committee prior to initiation of the study.

Consenting patients affected with only tinea cruris of age ranging from 18 years to 50 years were recruited in this study. We have taken only single variant of dermatophytosis, as the efficacy of any topical medication varies with site of involvement. This group had been chosen on the basis of results of several studies, that has found the age group of 21–50 years to be most affected with dermatophytosis.^{1,7,8} Only patients with Positive mycological confirmation by positive KOH test and positive lactophenol blue test were included, same were performed at the completion of study period to ascertain mycological cure. To remove inter-observer bias the KOH test and grading of clinical parameters were read by independent observer only (by authors SK and BS, respectively).

Patients with other body site involvement, patients who had received topical and oral antimycotic therapy two weeks and four weeks, respectively, prior to initiation of the study were excluded. Also patients who were on any kind of immunosuppressive therapy were excluded. Participants with known history of hypersensitivity to study drugs, or with superadded bacterial infection, or pregnant and lactating female, or immunocompromised patient and chronically ill patients were also not recruited.

All the participants in the study were subjected to the following detailed personal and clinical history recording, past and present medical history, past and concomitant drug history. Routine blood examination was done to rule out diabetes or any other co-morbid condition in selected cases. The study

medication was dispensed to the subject following randomization, provided all inclusion and exclusion criteria were satisfied. The patients were instructed to apply the cream thinly to the affected area.

Participants were randomized with the help of table of random numbers in to four groups containing 30 participants each. Group A, had received sertaconazole 2% cream applied twice daily for four weeks; while group B had luliconazole 1% cream applied once daily for two weeks. Group C had 30 patient on terbinafine 1% cream applied twice daily for two weeks and group D had 30 patient clotrimazole 1% cream applied twice daily for four weeks. At the end of treatment phase there was a follow up phase at the end of two weeks, where patients were reassessed clinically and mycologically. Primary efficacy was based on clinical and mycological assessment of tinea lesion at base line, at the end of treatment phase and follow up phase two week following completion of treatment. Clinical assessment was based on the proportion of patients with symptoms and signs of tinea lesions namely pruritus, erythema and desquamation, and graded as none (0), mild (1), moderate (2) and severe (3) depending on intensity. Mycologic assessment was based on KOH mounting for dermatophytes.

Secondary efficacy was assessed on the basis 'Physician Global Assessment' based on three criteria- successful treatment outcome (clinical cure + negative mycology), clinical success (symptomatic relief + clinical cure) and clinical failure (no clinical and mycological improvement), at end of 'Treatment Phase' and 'Follow-up Phase'.

Safety and tolerability was assessed by monitoring treatment related adverse events at each visit.

Patients who failed to follow up for two consecutive visits were considered as being lost to follow up was not included in the analysis.

Medicines

The sertaconazole cream was a gift from Glenmark-Gracewell, India; in the form of their market product Onabet Cream. The supply of luliconazole cream was a gift from Ranbaxy, India; in the form of their market product Lulifin Cream. Terbinafine was obtained as a gift from Abbott, India; in the form of their market product Tyza Cream. Whereas clotrimazole was made available through hospital pharmacy supply.

STATISTICAL ANALYSIS

All randomized patients who received study medication and completed the study were included for analysis. The difference in change in clinical assessment of pruritus, erythema, vesicle and desquamation. Mycological assessment by scraping of skin scales and examination in 10% KOH mount and physician global assessment, within and between the groups were analyzed using Chi-square test. Categorical variable was expressed in actual numbers and percentage,

and compared using Fisher’s exact test and intra group comparison performed using paired t-test. Two tailed $p < .05$ was considered as statistically significant.

RESULTS

The study was continued till 30 participants in each group were available for analysis; a study population of 120 participants was achieved. Age group obtained in this study was indeed ranged from 18 years to 50 years. There were 64 (53.3%) males and 56 (46.7%) female participants in this study. The participants were randomized into four study groups: (A) Sertaconazole, (B) Luliconazole, (C) Terbinafine, (D) Clotrimazole. Baseline characteristics of the study participants have been presented in table 1. The groups were balanced with respect to baseline characteristics.

Clinical Efficacy results

Changes in Pruritus [table 2]: At the end of treatment phase, the resolution of pruritus was seen in 93% of patients in sertaconazole group and 100% in luliconazole group, respectively; however complete resolution of pruritus occurred in both groups at the end of follow up phase. In terbinafine and clotrimazole groups, resolution of pruritus was not complete and only 73% in terbinafine group and 33% in clotrimazole

group were able to show resolution in pruritus at the end of follow up phase. The reduction in pruritus in luliconazole or setaconazole groups were significantly more than clotrimazole group. Reduction in terbinafine although less but no significant relation was found when compared to rest of the groups.

Changes in Erythema [table 3]: in sertaconazole group, at the end of treatment phase and at the end of follow up phase, the resolution of erythema was 73% and 100%, respectively; these parameters were exactly similar in luliconazole group. Terbinafine and clotrimazole appears to be less effective in reducing erythema when compared with sertaconazole/luliconazole.

Changes in desquamation [table 4]: in sertaconazole group, at the end of treatment phase and at the end of follow up phase, the resolution of erythema was 83% and 100%, respectively; again these parameters were exactly similar in luliconazole group. Terbinafine and clotrimazole appears to be less effective in reducing desquamation when compared with sertaconazole/luliconazole. In terbinafine group mild desquamation persisted in 33% participants, whereas it was persistent in 87% of participants in clotrimazole group. Sertaconazole and luliconazole, both had significantly level of change in desquamation proportions compared to clotrimazole.

Characteristics	Sertaconazole	Luliconazole	Terbinafine	Clotrimazole
Male	17	12	16	11
Female	13	18	14	19
Age in years (SD)	31.01 (7.7)	33.9 (8.1)	30.2 (7.0)	34.7 (4.9)
Proportion patients with moderate and severe erythema	80%	83%	80%	77%
Proportion patients with moderate and severe pruritus	77%	77%	77%	77%
Proportion patients with moderate and severe desquamation	57%	57%	57%	63%
KOH positive	100%	100%	100%	100%

SD: standard deviation; KOH: potassium hydroxide mount for microscopic identification of dermatophytes.

Table-1: Baseline characteristics of study population n=120

Pruritus Score	Sertaconazole			Luliconazole			Terbinafine			Clotrimazole		
	Base-line	End of treatment	Follow up	Base-line	End of treatment	Follow up	Base-line	End of treatment	Follow up	Base-line	End of treatment	Follow up
None	0	28	30	0	30	30	1	20	22	0	9	10
Mild	7	2	0	7	0	0	6	10	8	7	16	15
Moderate	12	0	0	13	0	0	13	0	0	12	3	5
Severe	11	0	0	10	0	0	10	0	0	11	2	0

Table-2: Comparison of changes in proportion of patients with pruritus

Erythema Score	Sertaconazole			Luliconazole			Terbinafine			Clotrimazole		
	Base-line	End of treatment	Follow up	Base-line	End of treatment	Follow up	Base-line	End of treatment	Follow up	Base-line	End of treatment	Follow up
None	0	22	30	0	22	30	0	19	21	0	15	18
Mild	6	8	0	5	7	0	6	11	9	7	11	11
Moderate	18	0	0	20	1	0	17	0	0	17	4	1
Severe	6	0	0	5	0	0	7	0	0	6	0	0

Table-3: Comparison of changes in proportion of patients with erythema

Desqua- mation Score	Sertaconazole			Luliconazole			Terbinafine			Clotrimazole		
	Base- line	End of treat- ment	Follow up									
None	0	25	30	1	25	30	0	10	20	1	7	4
Mild	13	5	0	12	4	0	13	20	10	10	15	26
Moderate	6	0	0	6	1	0	9	0	0	11	8	0
Severe	11	0	0	11	0	0	8	0	0	8	0	0

Table-4: Comparison of changes in proportion of patients with desquamation

Physician global assessment

Physician Global Assessment at end of 'Treatment Phase', the 'Successful Treatment Outcome' was 100% in sertaconazole group and luliconazole group as compared to terbinafine (70%) and clotrimazole (35.3%).

Mycologic assessment

At baseline all patients had positive KOH test for Dermatophytes. At end of 'Treatment Phase' and 'Follow-up' Phase, all patients showed negative mycological assessment (negative KOH test).

Safety assessment

All the medicines were well tolerated with mild application site adverse drug reactions (ADR). No severe adverse events were reported, no participants from the study discontinued due to ADR and no case of non-compliance to the therapy was reported. Burning sensation was reported in two participants each in sertaconazole, luliconazole and terbinafine groups.

DISCUSSION

In the present study, all the four study drugs showed significant reduction in signs and symptoms (*pruritus*, *erythema*, *vesicles* and *desquamation*) of tinea infections as compared to baseline. Sertaconazole and luliconazole were found to be equally effective, whereas clotrimazole was least effective among the four groups. Jerajani et al,⁹ Chandana T et al¹⁰ and A Tamil Selvan et al¹¹ have found sertaconazole to be more effective than luliconazole and terbinafine, in terms of reduction in pruritus, erythema, vesiculation and desquamation. However in all of these studies luliconazole was found close to sertaconazole in terms of efficacy. A meta-analysis had shown efficacy and safety rates for 2-week treatment of 1% luliconazole were nearly the same as those for 4-week treatment of the 2% sertaconazole; however author notes whether 2% sertaconazole has more excellent antifungal activity than 1% luliconazole, requires further trials for verification.¹¹

In view of lesser efficacy of clotrimazole compared to others, it would have been better to find antifungal susceptibility comparison of clotrimazole versus sertaconazole or luliconazole or terbinafine, however such data is lacking; particularly in literature available from India.

at the end of follow-up phase complete mycological cure

(100%) was observed with all the therapies which confirmed absence of recurrence and relapse of tinea corporis, our results are in accordance with Jerajani et al⁹ and Khan H et al.¹² In the present study, all three treatments were well tolerated and found to be safe. Burning sensation was reported in two participants each in sertaconazole, luliconazole and terbinafine groups, however none were considered serious.

The results of this study are likely to be confounded by the study design as it was an open labeled (non-blinded) study with smaller sample size. Also, the therapy duration was different for all the treatment drugs. However since most the clinical trials conducted with sertaconazole and luliconazole employed a four week and two week study design, respectively, so our study also employed similar duration of therapy. Furthermore, diagnosis of tinea corporis was purely on the basis of clinical examination and microscopic finding of KOH mount. We did not identify the causative organism for the tinea cruris by culture sensitivity.

CONCLUSION

Response to the topical monotherapy with and sertaconazole 2%, luliconazole 1%, terbinafine 1% and clotrimazole 1% cream was safe and well tolerated in the treatment of tinea cruris. Treatment with sertaconazole 2% cream and luliconazole 1% cream was early in the onset with tolerable side-effects. However treatment with luliconazole cream appears more convenient due to shorter course of application as well as once a day frequency. Our study suggests sertaconazole 2% cream and luliconazole 1% cream to be equally safe and effective, whereas it was surprising to observe least performance of the clotrimazole cream.

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Internal Fixation of Middle Third Clavicle Fractures

P. Ramesh Vyravan¹, B. Nellaiyappan², M. Mohankumar³

ABSTRACT

Introduction: Clavicle is the bone which connects the axial and appendicular skeleton. It's the first bone to ossify. The integrity of clavicle is essential for proper function of shoulder. Hence clavicle fractures have to be fixed for better functioning of the same side shoulder.

Materials and methods: The aim is to study the functional and radiological outcome of mid third clavicle fractures treated by internal fixation. We had 57 cases. Allman classification was used to classify the fracture. The period of the study was between 2009 – 2013. The implant used was 3.5 mm reconstruction plate. The cases were followed up regularly at the intervals of 6, 12, 18 and 24 weeks. X ray was taken immediate post op and during every follow up. Post operatively evaluated using constant and Murley scoring system.

Results: Total number of cases were 57. Among the 15 non unions which were operated 9 were post traumatic and rest were natively treated with traditional bone setters. Complications are three plate failures, one sub-acute infection and two cases with stiff shoulder.

Conclusion: Ambulatory treatment of fracture with arm support while maintaining satisfactory and acceptable alignment of fracture is the mainstay of treatment today. Clavicle fractures with indications give good results with operative treatment.

Keywords: Clavicle fracture, Midthird, Surgical Fixation, Open reduction and internal fixation, Reconstruction plate

INTRODUCTION

Clavicle fractures are the most common long bone fractures. There is still controversy whether they should be operated or treated non operatively. Clavicle fractures if occurs in children can be treated conservatively. But in active adults treating them operatively gives better outcomes. Also it reduces the post treatment complications like shoulder arthritis if treated conservatively.¹

Some important anatomic features of clavicle are 1) Clavicle is the first bone to ossify. 2) Only long bone lying horizontal. 3) Only long bone with two primary centres. 4) Only long bone with membranous ossification. 5) It is subcutaneous throughout. 6) Only structure crossing it is supraclavicular nerve, occasionally piercing it.² 7) Only bone of shoulder girdle forming synovial joint with the trunk.³

During evolution man evolved from quadrupeds like monkeys. As evolution advanced man started walking with using the both front limbs for activities other than walking. Hence

he has to train in such a way that the upper limbs have to reach the space in front, back or all round and grasp objects. For this requirement he needs a support of the limb so that the specialized functions can be performed unhindered. That stability and ability to perform the specialized and normal day today activities by the upper limbs is given by the clavicles. Because clavicle is a bone which supports the appendicular skeleton and also connects axial to the appendicular skeleton.

Clavicle fractures have deforming forces which make it very difficult to reduce the fracture closed and even if able to reduce it will very difficult to maintain reduction. In middle third fractures the medial fragment will be displaced superiorly by the pull of sterno mastoid muscle and posteriorly. The lateral fragment pulled inferiorly and anteriorly due to the weight of the shoulder.¹

Lateral third clavicle fractures rarely need surgical treatment because they heal well due to presence of intact ligaments and periosteal sleeve. But certain clavicle fractures of lateral end need surgical treatment if they are associated with floating shoulder, ipsilateral poly trauma, multiple rib fractures and bilateral clavicle fractures. Our study is able to convincingly prove that operative treatment is the best treatment option for clavicle fractures.

MATERIALS AND METHODS

The aim is to study the functional and radiological outcome of mid third clavicle fractures treated by internal fixation. Initially the cases were evaluated fully and x ray were taken. We included all the middle third clavicle fractures based on Allman classification. All man classification divides the clavicle fractures into three broadly as lateral end, medial end and middle third fractures. Middle third fractures are sub divided into undisplaced, displaced and comminuted.

The study was a prospective study from 2009 to 2013. Total-

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ly 86 cases were selected. Using the exclusion criteria (Table 2) we excluded cases with cervical spondylosis, peri-arthritis shoulder, frozen shoulder, diabetes mellitus and head injury patients who are not fit to be operated immediately. The cases were evaluated fully. X ray of the affected side clavicle was the routine x ray and based on that we classify the cases. The absolute indications (Table 3) which we followed in our study are - fractures with neurovascular compromise, open fractures, poly trauma, fractures medial to coraco clavicular ligament, floating shoulder, multiple ipsilateral rib fractures, symptomatic nonunion, bilateral clavicle fractures. The relative (Table 3) indications include – displacement more than 1 cm, shortening more than 2 cm, cosmetic reasons mainly females and comminution. After that pre op evaluation and planning was done and surgical stabilization was performed. The patient was positioned in beach sir position in a radio-lucent table. The incision is anterior to the clavicle centering over the fracture site. Platysma was separated in deep dissection. We used a 3.5 reconstruction plate. The plate was contoured and applied superoirlly.¹⁰ X ray was taken immediate post op and and the limb was immobilized in arm sling. Light weight activities were allowed from post op day one. Heavy activities like lifting weights etc were discouraged till there is radiological union.

We followed up the cases at 6 weeks, 12 weeks, 18 weeks and 24 weeks. During every follow up we evaluated the patient clinically and radiologically. We used the Constant and Murley scoring system. The signs of union⁴ are if there is no pain at fracture site with fairly good range of motion in the affected side shoulder with no fracture line visible in x ray

RESULTS

Total number of cases 86. After applying exclusion criteria we had totally 57 clavicle fractures in 46 patients with 11 bilateral cases. Among these males were 31 and females were 15 and among the bilateral we had 8 males and 3 females. 29 cases were excluded. The excluded cases include cervical spondylosis –13, head injury –11, frozen shoulder –1, peri-arthritis shoulder– 4. Among the cases with proper indications nonunion were – 15, floating shoulder – 11, displaced >2cm – 11, bilateral – 9, SCV compression – 2, cosmetic like swelling – 3, Comminution – 5, shortening – 1.

All the patients were fixed with 3.5mm reconstruction plate of appropriate length. If needed plates were contoured. In comminuted fractures bone grafting was done. The plates were put in the superior aspect.¹⁰ Bone grafting was also done in nonunion cases. Both iliac and synthetic bone grafts were used. Mostly synthetic ones were used to reduce the morbidity of the patient. Among the 15 non unions which were operated 9 were post traumatic and rest were natively treated with traditional bone setters. Among the 11 floating shoulder patients 8 had both scapula fracture and ribs fracture and rest had scapula fracture alone. Among the 11 displaced fractures 6 had gross displacement with skin tether-



Figure-1: Pre operative Clavicle x ray AP view showing middle third displaced fracture; **Figure-2:** Post operative x ray AP view showing plate insitu with united fracture.

First bone to ossify in human
Only long bone lying horizontal
Only long bone with two primary centres
Only long bone with membranous ossification
It is subcutaneous throughout
Only structure crossing clavicle is supraclavicular nerve, also occasionally pierce it in middle
Only bone of shoulder girdle forming synovial joint with trunk
Table-1: Clavicle – Important facts

Shoulder of affected side having before trauma
- Cervical Spondylosis
- Peri Arthritis
- Frozen Shoulder
- Diabetes Mellitus
Also patients with head injury, non-co-operating patients
Table-2: Exclusion criteria

Fractures with NV compromise
Open fractures
Poly trauma
Fracture medial to coraco clavicular ligament
Floating shoulder
With multiple ipsilateral ribs fracture
Symptomatic non union
Bilateral clavicle fractures
Relative
More than 1cm displacement
More than 2cm shortening
Cosmesis, mainly females
Comminution
Table-3: Indications: absolute

ing. All the 3 cases with cosmetic reasons were females and all were initially treated non operatively. The complications are three plate failures, one sub-acute infection and two cases with stiff shoulder.

DISCUSSION

We had excellent result of 79%, good result in 9%, fair result in 6%, and poor result in 6%. In our series 45 patients had excellent outcome. At the end of 12 weeks they had excellent clinical and radiological union and on clinical examination the patients had excellent to normal shoulder movements on

the affected side. They were able to do their daily activities without any morbid disability. By reviewing literature we found good union will be achieved in 95% of cases.^{6,7,8,9}

We had 5 cases of non-union that is 9 %. By reviewing the literature we found that the non-union rate is found to be between 0.1% to 15%.^{4,5} The reason for non-union is among the five cases three were comminuted, one was implant failure and one sub clinical infection. The patient with sub clinical infection was treated with antibiotics and then plate was removed and refixed with bone grafting. Among the three implant failures one was due to stress raisers at the fracture site and the one due to plate breakage.

We had one more implant failures in whom the plate was broken at the fracture site because of sports injury who when playing had a fall on the affected side again within 8 weeks of first fall. During follow up he had excellent union but because of impact of the injury might have caused the breakage. All the broken plates were removed and re fixation done with bone grafting.

According to literature the delayed union rate is 2.7% in middle third fractures.⁴ In our series the delayed union rate is 3 % that is in one case in our series. The reason for delayed union is there is one plate hole over the fracture site and hence acted as a stress raiser. The patient was followed up upto 20 weeks and treated with arm sling and rest to the limb and the fracture united un eventfully at the end of 19 weeks.

CONCLUSION

Clavicle is an essential continuity between axial and appendicular skeleton. For proper use of upper limbs the stability was provided by the clavicle on either side. When there is no stability bio mechanically there will be difficulties of the upper limbs. Hence proper and anatomic reduction and restoration of normal stability of the affected side limb is essential. Traditionally clavicle fractures were treated conservatively with rest to the limb and strapping. By these options they unite uneventfully but the same side shoulder will be affected and resulting in pain and disability because the length of the clavicle could not be restored by these conservative options.

So the individuals will be having morbid disability. The clavicle which is an essential support for us to perform our daily activities hence can be treated operatively better with the advanced options available.

Middle third clavicle fractures with good indications if treated by operative fixations give excellent result.¹

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Outcome Analysis of Intertrochantric Fracture Treated with Dynamic Hip Screw in Rural Population

Ranjith Rajasekeran¹, Vignesh Jayabalan², Ganesan Ganesan Ram³

ABSTRACT

Introduction: Trochanteric fractures are devastating injuries that commonly affect the elderly and have a tremendous impact on the health care system and society in general. The aim of this study is to assess the functional outcome of trochanteric fractures treated with dynamic hip screw in rural population.

Materials and Method: Prospective study of forty patients of trochanteric fractures who underwent dynamic hip screw fixation during January 2012 to January 2015. We used Boyd and Griffin classification to classify the fractures. Functional assessment was done using Kyle's criteria. Minimum follow up was one year.

Results: Excellent and good results were obtained in twenty-nine cases out of total of forty cases comprising of 72.5%. Fair and poor results were obtained in eleven cases constituting 27.5%.

Conclusion: Operative treatment is the best modality in managing trochanteric fractures. Patients from rural background come late for surgery and their expectation levels following surgery are very high because of the need to squat for toilet purpose and sit crossed legged for sitting on the floor.

Keywords: Intertrochanteric fracture, Dynamic hip screw, Rural population, Kyle's criteria

INTRODUCTION

Trochanteric fractures are devastating injuries that commonly affect the elderly and have a tremendous impact on the health care system and society in general.¹ About three or four decades back, trochanteric fractures were considered as a terminal event of life especially in the elderly because of prolonged immobilization leading to fatal complications like pulmonary embolism, renal impairment and bed sores. Nowadays Trochanteric fractures are adequately treated by modern surgical modalities with excellent results with hardly any residual deformity.² The aim of this study is to assess the functional outcome of trochanteric fractures treated with dynamic hip screw in rural population.

MATERIALS AND METHOD

Prospective study of forty patients of trochanteric fractures who underwent dynamic hip screw fixation during January 2012 to January 2015. The inclusion criteria were patients

with intertrochanteric fracture above fifty years treated with dynamic hip screw with atleast one year follow up. The patients included were manual labourers, farmers and unskilled labour force. The exclusion criteria were subtrochanteric fractures and intertrochanteric fractures treated by modalities other than dynamic hip screw, skilled labourers. We used Boyd and Griffin classification to classify the fractures.³ Functional assessment was done using Kyle's criteria.⁴ Minimum follow up was one year. Two patients had Colle's fracture, 1 patients had inf. Pubic ramus fracture, 1 Patients had L1 Compression fracture with no neurological deficit as associated injuries.

Anteroposterior and lateral x-rays were taken of the affected hip. All data regarding the mode of injury and other particulars were recorded in a detailed proforma, which was exclusively prepared for the study. Associated medical co-morbidities involving cardiac, respiratory and renal systems were assessed by cardiologist, pulmonologist and nephrologist and due care was given to minimize the surgical risk. All patients underwent surgery either under regional or spinal anaesthesia. Cefuroxime 1.5 gm was the antibiotic of our choice.

Patients were nursed post-operatively in the orthopedic ward unless they needed intensive care treatment in which case they were retained in surgical ICU for 48-72 hours and then brought to the orthopedic ward. The Romovac suction drain was removed in 48 hours. Patients were mobilized nonweight bearing from second postoperative day.⁵ Patients were given chest physiotherapy, quadriceps and hip exercises by the physiotherapist during the postoperative period. Patients were discharged on 5th postoperative day and Sutures were removed on 14th post-operative day.

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Gradual ambulation with partial weight bearing was started around 6-8 weeks when the patient could do active straight leg rising. Postoperative x-rays were taken at 6 weeks, 12 weeks, 6 months and one year and then during yearly follow up.

RESULTS

Results as per Kyle's criteria were tabulated in table 1. In this Study of 40 patients, there were 28 males constituting 70% and 12 females constituting 30%. In this Study there were twenty cases of road traffic accidents, ten cases of trivial fall and five cases of fall from height. Complication was tabulated as per table 2.

DISCUSSION

The operative management consists of fracture reduction and stabilization of the fractures allowing early mobilization thereby minimizing the complications of recumbences. Such early mobilization following surgical fixation is preferred by most of the authors in preference to conservative treatment, which increase the morbidity and mortality.

In our study of 40 patients, there were 28 Males comprising 70% and 12 Females comprising 30%. This is comparable to the Indian series that show a male preponderance as in Chacko et al⁶ and Sethi et al⁷ series. In the reported series by T.S.Sethi⁷ the percentage of trivial fall has been as high as 77% indicating probably that elderly people comprise the majority of cases in their study. In our series only 25% of cases had sustained trochanteric fractures due to trivial fall. In our series, road traffic accidents were the main cause of injury comprising 62.5% of cases. In our study, type II fractures comprised the majority of cases with an incidence of 55% (22 cases).

In the present study, the over all excellent and good result were obtained in twenty nine cases out of total of forty cases comprising an incidence of 72.5%. Fair and poor results were obtained in eleven cases with an incidence of 27.5%. Poor results were obtained in three cases out of forty cases with an incidence of 7.5%. Results of our study are consistent with that of other authors. Babhulkar et al⁸ has showed excellent and good results, in more than 90% of cases in a series comprising of 70 cases. Our results have been inferi-

or compared to Babhulkar Series because patients from our series have come from a rural background and have come for surgery after trying other modalities of treatment thereby delaying the definitive treatment. Results of other foreign authors as recorded in literature are far superior then our study. Sitting and squatting for toilet purposes are activities of daily living in our patients, which vitiates excellent to good results in our study. In our study of 40 cases, there were 1 case with superficial infection (2.5%) which respondent to antibiotics, there were 2 case (with implant cutout (5%) and 1 patient had coxavara deformity (2.5%). Our results were comparable to that of Chatterjee et al.⁹

CONCLUSION

Road traffic accidents are also becoming a common cause of trochanteric fractures. Operative treatment is the best modality in managing trochanteric fractures. Patients from rural background come late for surgery and their expectation levels following surgery are very high because of the need to squat for toilet purpose and sit crossed legged for sitting on the floor.

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S. No.	Result	No. of Cases	Percentages
1	Excellent	11	27.5%
2	Good	18	45 %
3	Fair	08	20 %
4	Poor	03	7.5 %
5	Total	40	100.00 %

Table-1: Results as per Kyle's Criteria

Complication	No.of Cases
Superficial Infections	1
Implant Cutout	2
Coxavara Deformity	1

Table-2: Complications

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Surgical Treatment of Supracondylar Femoral Fractures

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ABSTRACT

Introduction: In today's fast paced world high energy trauma is common. Supracondylar femur fractures are one of the common fractures encountered. The distal femur has wide medullary canal, thin cortex and often associated with comminution. Management of these supracondylar femoral fractures is a challenge to orthopaedic surgeons. Still there is controversy in the correct line of management to be selected. The surgeons will face difficulties in restoring the anatomical alignment and joint congruity.

Materials and methods: Between Jan 2009 to Jun 2014, 26 distal femoral fractures treated with supracondylar nail. 2 pts lost for follow-up. Of the remaining 24 fractures, 19 were closed fractures 5 were of open fractures. Average age was 54 yrs (20 to 84 yrs). 60 % of pts were older than 50 yrs of age. AO classification was used for these fractures (A type: 14, C type: 10). Open nailing was done in 6 cases (4 for nonunion, 2 for failed DCS). Bone grafting was done in 4 patients.

Results: Average follow-up was 14 months (6 - 24 months). Wt bearing was allowed depends on the progression of union radiologically and clinically. Functional assessment was done using a scale developed by Sanders et al for distal femoral fractures. 23 fractures healed well and 1 pt had nonunion. Average healing time was 16 to 18 weeks. 1 pt had malunion, 1 pt had infection at the fracture site, which went on for good union (grade IIIb compound). Knee stiffness was found in 4 cases (<60 degrees).

Conclusion: Supracondylar nail provides stable fixation in a region of femur where a widening canal, thin cortices, and poor bone stock make fixation difficult. The retrograde supracondylar nail is an excellent alternative to lateral fixation devices for supracondylar fractures of femur.

Keywords: Supracodylar, Femoral, Knee stiffness

INTRODUCTION

Supracondylar femoral fractures are the fractures that occur within 7.5 to 9 cm¹ proximal to the articular surface of knee joint. These fractures predominantly occur in two patient populations: a younger male group with high energy injuries and an older osteoporotic female group with low violence injuries. Treatment of these fractures has long been a controversial issue. Watson Jones noted that "few injuries present more difficult problems than Supracondylar fracture of femur".

The problems in these fracture when they are surgically treated are, reduction and fixation of multiple fragments (of-

ten in Osteoporotic bone) restoration of alignment in three planes and equal limb length. Once all these are attained with good restoration of articular surface, stiffness may remain a problem. A complaint patient is required for early supervised mobilization and range of movement exercises.

In 1967 Neer et al² published a review of 110 supracondylar fractures treated with traction, casting, and several types of internal fixation. They concluded that these fractures were not suitable for internal fixation because of high incidence of wound complications, nonunion and knee stiffness. The methods of internal fixation in these patients, however, were not sufficient to eliminate postoperative immobilization. As implants and surgical techniques improved during the next 20 years, more success with surgical treatment was attained. In the 1980's several series reported on the treatment of supracondylar femoral fractures with lateral fixation devices. Various implants available for the usage are DCS, Condylar blade plate, Supracondylar buttress plate. All these implants need a large exposure and possible risk of soft tissue damage and devascularisation of fragments, increased chance of infection, stiffness of knee and the need for Bone grafting in more than 1/3rd of patients.

Supracondylar fractures tend to collapse into varus. During application of a blade plate or condylar screw the shaft of the femur is often pulled laterally, displacing the line of wt bearing lateral to the anatomic axis of the condyles. This often leads to varus displacement of the distal femur in elderly female patients, leads to fixation failure with screws and plates cutting out of the soft bone.

In 1990 Green SL³, Seligson D, Henry SL 1st reported the use of GSH nail for Supracondylar fracture. The advantage of intramedullary device is that it aligns the femoral shaft with condylar fragments, reduce the varus moment at the fracture site, possibility of closed procedure reduces the chance of infection and stiffness of knee joint. They advised this technique for comminuted / intraarticular fractures of distal femur and in cases of failed lateral fixation technique.

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MATERIAL AND METHODS

Between January 2009 to June 2014, 26 supracondylar fractures were treated with supracondylar nailing. 2 patients lost for follow up. The age range was 20 to 84 years (average 54 years). Male to female ratio was 14:10. 14 patients are older than 50 years. 8 patients are younger than 50 years. 20 fractures were closed and 4 were open, of which 2 are Grade II and another 2 are Grade IIIb.

The fractures were classified according AO classification: The breakup is 14 were extra articular fracture. Among these - A1: 6, A2: 4, A3: 4. 10 were intraarticular fracture. Among these - C1: 6, C2: 2, C3: 2.

Open nailing was done in 6 patients and closed nailing was done in 18 pts. 4 pts were operated for nonunion of supracondylar fracture due to initial native treatment. 2 pts had implant failure with DCS which needed removal of DCS and supracondylar nailing. 4 pts needed bone grafting in this series. Average blood loss was 300 – 400 mg in open nailing. Average surgical time was 1 ½ - 2 hrs. Follow-up period was 6 months- 24 months. Patients were mobilized on the 3rd postoperative day with support and toe touch wt bearing. Knee mobilization encouraged from 2nd POD. Progressive weight bearing allowed depending on the radiological and clinical evidence of healing. Patients were followed up regularly in 6 weeks interval till union and good ROM was obtained.

RESULTS

Functional assessment was performed using a scale developed by Sanders⁴ et al for distal femoral fractures. Average healing time was 16 – 18 weeks. We has Implant failure in 1 patient with distal screw breakage, Infection in 2 patients, Malunion in two 2, Nonunion in 1, Knee stiffness in 4 cases who had ROM < 60°, shortening of 3 cm in 3 patients. Our study had average ROM 90 – 110 degrees. We used Sanders et al rating scale. We had excellent in 6 cases, good in 12 cases, fair in 4 cases and poor in 2 cases. Among the cases A type had excellent to good results in 12 out of total 14 cases. C type had excellent to good results in 6 out of 10. In 2 patients the distal locking screws missed the nail because of poor targeting device. Patellar impingement noticed in 2 patients, one patient had gross restriction of ROM of less than 30 degrees

DISCUSSION

All fractures except one in the present study healed in 16 to 18 weeks. Previous studies using lateral screw and plate fixation report similar times to healing, but 25% to 35% needed bone grafting because of delayed union or non unions. In our study 4 patients needed Bone grafting because of non union of supracondylar fractures due to initial native treatment

which was treated with supracondylar nail. Several rating system for supracondylar fracture exists. Sanders⁴ et al rating system (Table 1) was chosen because it emphasis the most important patient outcome factor pain and knee ROM. Patients with

Function	Result	Points
Range of motion - Flexion		
>125	Excellent	6
100 – 124	Good	4
90 – 99	Fair	2
<90	Poor	0
Extension		
0	Excellent	3
<=5	Good	2
6-10	Fair	1
>10	Poor	0
Deformation - Angulation		
0	Excellent	3
<10	Good	2
10-15	Fair	1
>15	Poor	0
Shortening (cm)		
0	Excellent	3
<1.5	Good	2
1.5 – 2.5	Fair	1
>2.5	Poor	0
Pain		
None	Excellent	10
Occasional or with changes in weather, or both	Good	7
With fatigue	Fair	5
Constant	Poor	0
Walking ability		
Unrestricted	Excellent	6
>30 minutes to <60 minutes	Good	4
<30 minutes	Fair	2
walks at home, is confirmed to wheelchair, or is bedridden	Poor	0
Stair climbing		
No limitation	Excellent	3
Holds rail	Good	2
One stair at a time	Fair	1
Elevator only	Poor	0
Return to work (A or B)		
A. Employed before injury		
Returned to pre injury job	Excellent	6
Returned to pre injury job With difficulty	Good	4
Altered full time job	Fair	2
Part time job or unemployed	Poor	0
B. Retired before injury		
Returned to pre injury lifestyle	Excellent	6
Needs occasional help	Good	4
Needs assistance at home with Activities of daily living	Fair	2
Moved in with family or Nursing home	Poor	0
Excellent: 36-40 points; Good: 26-35 points; Fair: 16-25 points; Poor: 0 -15 points		
Table-1: Sanders scoring system		



Figure 1 and 2: Pre-operative X-rays Showing Comminuted Fracture of Supracondylar Femur- AP and Lateral

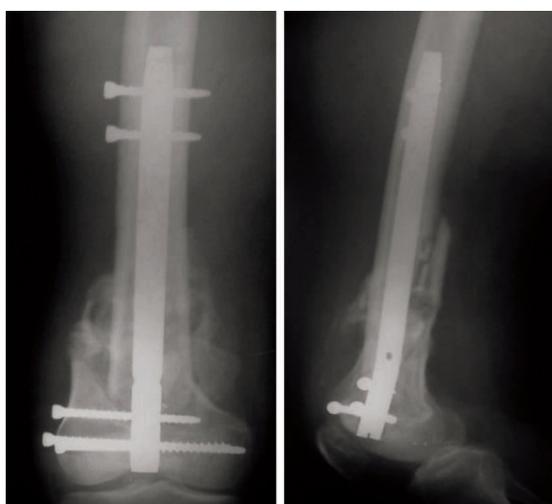


Figure 3 and 4: Post-operative X-rays Showing Implant insitu with good fracture healing in reasonable alignment

preexisting osteoarthritis can lead to lower scores despite acquiring pre injury knee status. 4 patients had poor Knee ROM. 2 with distal migration of nail and in 2 pts because of adhesions both intraarticular and extra articular due to open reduction of the fracture and extensive comminution of fragments which prevented early mobilization.

3 patients had 2 cm shortening which did not affect the overall function of the limb. Infection was found in 1 patient who had a Grade III B compound fracture, which was initially stabilized with external fixator and wound debridement and later converted to nail.

Malunion occurred in 1 patient where the nail got rotated during insertion with a femoral shaft fracture near the proximal end of the nail which was treated conservatively with a POP. This patient had gross knee stiffness along with angular and rotational malunion. He had a poor score of 14.

Nonunion occurred in 1 patient who was obese with heavy smoking habit. He had failure of DCS for supracondylar fracture which needed removal of the implant and converted to SC nail with bone grafting. This patient had nonunion at

the fracture site, and he refused further surgery. He had a poor score of 10.

2 patients had nail migration distally in to the joint. One case was C2 fracture, in which the articular fracture was not fixed properly and the nail got migrated anteriorly through the fracture site impinging the patella and caused restriction knee ROM. One patient because of distal screw breakage and nonunion of the fracture site, the nail migrated into the joint. Both of them refused further surgery for removal of the nail.

We found excellent to good results in 18 pts (75%). Out of 14 A type fractures 12 had excellent to good results, 2 had fair and no poor results. Out of 10 C type fracture 6 had excellent to good results, 2 had fair and 2 had poor results.

Richard Gellman⁵ et al (CORR: 1996: 332) in their study on 26 supracondylar femoral fractures treated with SC nail. They had 4 excellent, 15 good, 2 fair and 2 poor results. One pt needed bone grafting in their series. They found that supracondylar nail gives good functional outcomes comparable to lateral fixation devices with significantly less soft tissue dissection. Danziger MB et al in their study on 23 supracondylar fractures managed with SC nail, they had 94% excellent to good results at an average of 3.3 months.

Ingman⁶ A et al developed an implant in which the distal (condylar) screws have a diagonal configuration so that the screws can be closer to the distal end of the nail, allowing more distal fractures to be fixed. It also utilizes the denser bone of the posterior condyles for more secure fixation in osteoporotic patients. The new implant was used for 24 extra-articular fractures and for 14 articular fractures. There was no significant difficulty with obtaining fixation in very distal fractures and in osteoporotic bone. All fractures united within 3 months except one which required a bone graft at 6 months. Average knee flexion at final follow-up was 101 degrees for extra-articular fractures and 106 degrees for articular fractures. Surgical exposure for nail placement requires significantly less periosteal stripping and soft tissue exposure than that of lateral fixation devices. The retrograde supracondylar nail is an excellent alternative to lateral fixation⁷⁻¹⁰ devices for supracondylar fractures of femur.

CONCLUSION

Supracondylar nail provides stable fixation in a region of femur where a widened canal, thin cortices, and poor bone stock make fixation difficult. We had excellent to good results in 18 pts (75%) and fair in 4 cases and poor in 2 cases. Orthopaedic surgeons experienced with intramedullary nailing will find the supracondylar nail a useful technique. The future prospect arthroscopically assisted method for the retrograde intramedullary nailing of supracondylar femoral fractures affords the potential benefits of intramedullary fixation of these fractures while avoiding the morbidity and complications associated with an arthrotomy.

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Dyslipidemia as an Early Harbinger of Erectile Dysfunction in Type 2 Diabetics

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ABSTRACT

Introduction: Sexual dysfunction is a common, underappreciated complication of diabetes. Men with diabetes tend to develop ED 10 to 15 years earlier than men without diabetes. As men with diabetes age, ED becomes even more common. Diabetes can damage the blood vessels and nerves that control erection. Hyperlipidemia may impair erectile function by affecting endothelial and smooth muscle cells of the penis. This study was undertaken to investigate the correlation between serum lipids and ED.

Material and method: 150 type 2 DM patients were enrolled for this retrospective study done at S P Medical College Bikaner. ED was diagnosed by using international index of ED (IIEF-5).

Results: The mean duration of DM was 2.84+1.99 in patient without ED and 8.94+6.36 in patient with ED that was statistically significant ($p < 0.001$). FBS and HbA1c were other parameters that were correlated significantly. The mean lipid profile TC, LDL, TG, HDL were 158.36+15.38 and 186.26+38.88; 97.06+16.98 and 119.33+31.94; 116.33+37.30 and 94.09+14.48; 50.18+7.05 and 44.08+8.13 respectively in patient without ED and with ED that were statistically significant ($p < 0.001$). However mean VLDL was 21.60+4.16 and 23.00+7.17; in patient without ED and with ED that was statistically insignificant.

Conclusion: ED almost always has an organic or mixed etiology. This often results in diabetic men reporting more severe ED when they present for treatment of this condition. Because men with diabetes value their erectile function highly, it is important that health care provider must encourage them to maintain good glycemic, blood pressure, and lipid control to minimize their risk of developing this complication.

Keywords: Impotence; Diabetics; Dyslipidemia; Erectile dysfunction.

culty with erectile function. Male sexual dysfunction among diabetic patients can include disorders of libido, ejaculatory problems, and ED. All three forms of male dysfunction can cause significant bother for diabetic patients and can affect their quality of life. While all three forms of male sexual dysfunction can be found among diabetic men, our study will focus on the most common form, ED, as this being the most predominant comorbidity affecting quality of life in diabetic patient. ED is defined as the inability to achieve or maintain an erection sufficient for satisfactory sexual performance¹; ED is highly prevalent in diabetic men² and is almost always organic in its etiology. Despite this, health care providers often do not specifically ask their male diabetic patients about sexual function. This results in considerable under diagnosis because patients are often reluctant or embarrassed to initiate discussion of these issues themselves. The causes of ED in men with diabetes are complex and involve impairments in nerve, blood vessel, and muscle function. To get an erection, men need healthy blood vessels, nerves, male hormones, and a desire to be sexually stimulated. Diabetes can damage the blood vessels and nerves that control erection. Therefore, even if patient has normal amounts of male hormones and has the desire to have sex, he still may not be able to achieve a firm erection.

Although the etiology of ED in patients with diabetes is often complex and can be caused by several mechanisms, organic vasculogenic factors appear to be the most frequent cause of ED in men with diabetes³ with some studies citing an incidence of up to 87% and even 90%⁴ in one of the studies. The pathogenesis of ED in diabetic patient may be linked to accelerated atherosclerosis.⁵ Hyperlipidemia may impair erectile function by affecting endothelial and smooth muscle cells of the penis. Among the metabolic abnormalities

INTRODUCTION

Sexual dysfunction is a common, underappreciated complication of diabetes. It is being estimated that about 35%-75% of men with diabetes will experience at least some degree of erectile dysfunction also called ED or impotence during their lifetime. Men with diabetes tend to develop ED 10 to 15 years earlier than men without diabetes. As men with diabetes age, ED becomes even more common. Above the age of 50, the likelihood of having difficulties with an erection occurs in approximately 50%-60% of men with diabetes. Above age 70, there is about a 95% likelihood of having some diffi-

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that commonly accompany diabetes are disturbances in the production and clearance of plasma lipoproteins. The lipid changes associated with diabetes mellitus are attributed to increased free fatty acid flux secondary to insulin resistance. In fact development of dyslipidemia may be a harbinger of future diabetes. A characteristic pattern, termed diabetic dyslipidemia, consists of low high density lipoprotein (HDL), increased triglycerides, and postprandial lipemia. This pattern is most frequently seen in type 2 diabetes and may be a treatable risk factor for subsequent cardiovascular disease and related comorbidities. It has been shown from numerous studies that dyslipidemia often is found in prediabetes, patients with insulin resistance but normal indexes of plasma glucose.⁶ Various trial of glucose reduction have confirmed that glucose control is the key to preventing microvascular diabetic complications. These trials have, however, failed to show a marked benefit of glucose control on macrovascular disease. Large vessel atherosclerosis is not a diabetes-specific disorder, yet it is worse in patients with diabetes; however, processes unrelated to diabetes must be the most important. For this reason it may not be surprising that treatment of these other processes, such as hypertension^{7,8} and hyperlipidemia⁹, appears to impact macrovascular disease more than does glucose control. This study was undertaken to investigate the correlation between serum lipids (cholesterol, LDL, HDL, triglyceride (TG) and erectile dysfunction (ED).

Ethnic statement

A written informed consent was obtained from each subject included in the study. Ethical approval for the study was obtained from the Ethical committee S P Medical College, PBM and A.G of hospitals Bikaner, Rajasthan prior to the commencement of the study.

Material and methods

Present study was conducted among the patient admitted to

Medicine Department PBM and A.G of Hospital, a tertiary care center of North West rajasthan from June 2014 to June 2015. Patients of age group 35-65 years diagnosed according to ADA revised criteria 2013 were included in the study. Patients who were seriously ill, known cases of type 1 DM, history of pelvic trauma or pelvic surgery, history of psychiatric disease, men with debilitating disease or having an unfavorable penile anatomy for sexual act were excluded from the study. A thorough clinical examination was conducted and the findings along with other demographic data were recorded on predesigned and pretested performa. History regarding duration and treatment of diabetes was noted. Patient's Compliance with the medication was also noted. Patients were also evaluated for the presence of sexual dysfunction, peripheral vascular disease and other macro and micro vascular complications.

The diagnosis of sexual dysfunction was done with following criteria:

- A sexually competent male must have desire for his sexual partner (libido).
- Be able to divert blood from iliac artery in to corpora cavernosa to achieve penile tumescence and rigidity (erection).
- Discharge sperm and prostatic/seminal fluid through urethra (ejaculation).
- Finally experience a sense of pleasure (orgasm).

Hypoceptive sexual disease (HSD) (according to DSM IV) was defined as persistently and recurrently deficient sexual fantasy and desire for sexual activity leading to marked distress or interpersonal difficulty. In male diabetics predominant disorder is of erectile dysfunction but HSD is also seen however in female diabetic the predominant form of sexual dysfunction is HSD. Local examination of genitalia was also performed to rule out any congenital deformity. Testis was felt for size and consistency, sensation over penis and bulbo-

Characteristics	ED	Mean	SD	SE	t	P
Age	Present(n=117)	53.28	6.52	1.04	4.089	<0.001
	Absent(n=33)	44.09	6.83	2.06		
Duration	Present(n=117)	8.94	6.36	1.02	3.118	0.003
	Absent(n=33)	2.84	1.99	0.60		
BMI	Present(n=117)	26.12	4.86	0.78	0.807	0.423
	Absent(n=33)	24.87	2.87	0.87		
WHR	Present(n=117)	0.94	0.03	0.05	1.982	0.053
	Absent(n=33)	0.92	0.03	0.09		
Systolic BP	Present(n=117)	145.23	18.03	2.89	2.442	0.018
	Absent(n=33)	131.27	10.48	3.16		
Diastolic BP	Present(n=117)	86.00	9.83	1.57	-0.219	0.828
	Absent(n=33)	86.73	9.39	2.83		
S Creatinine	Present(n=117)	1.20	0.55	0.08	0.549	0.586
	Absent(n=33)	1.09	0.62	0.19		
Fasting BS	Present(n=117)	153.69	46.52	7.45	2.046	0.046
	Absent(n=33)	123.18	30.52	9.20		
HbA _{1c}	Present(n=117)	8.53	1.78	0.39	3.050	0.004
	Absent(n=33)	6.66	1.79	0.54		

Table-1: Anthropometric and biochemical parameters in study group with and without erectile dysfunction.

cavernous reflex. ED was diagnosed by using international index of ED (IIEF-5).¹⁰ Other relevant evaluations were performed regarding evaluation of peripheral vascular disease and other micro as well as macrovascular complications.

Fasting blood samples were drawn for investigations such as FBS and lipid profile (total cholesterol, triglycerides, HDL and LDL). The fasting blood glucose and lipid profile were measured using spectrophotometry technique. The data obtained was tabulated on Microsoft Excel spreadsheet. Categorical data was expressed as rates, ratios and percentages. Continuous data was expressed as mean \pm standard deviation (SD) Pearson's Correlation coefficient (*r*) was used to assess the correlation between serum lipids and ED.

RESULTS

This study was conducted among 150 type 2 DM patients attending either OPD, diabetic clinic or was admitted to medicine ward. The baseline anthropometric characteristics of patients included in the study are shown in table 1. The mean age was 44.09 \pm 6.83 in patient without ED and 53.28 \pm 6.52 in patient with ED that was statistically significant ($p < 0.001$). The mean duration of DM was 2.84 \pm 1.99 in patient without ED and 8.94 \pm 6.36 in patient with ED that was statistically significant ($p < 0.001$). The mean BMI was 24.87 \pm 2.87 and 26.12 \pm 4.86 without and with ED respectively that was statistically insignificant. The mean SBP was 131.27 \pm 10.48 and 145.23 \pm 18.03 without and with ED respectively that was statistically significant ($p < 0.001$). The mean DBP was 86.73 \pm 9.39 and 86.00 \pm 9.83 without and with ED respectively that was statistically insignificant. The FBS was 123.18 \pm 30.52 and 153.69 \pm 46.52 without and with ED respectively that was statistically significant ($p < 0.046$). The mean HbA1c was 6.66 \pm 1.78 and 8.53 \pm 1.79 without

and with ED respectively that was statistically significant ($p < 0.004$). Prevalence and severity of ED is shown in table 2. Detailed analysis of the above table revealed that although the prevalence of ED increasing with age however contrary to increasing prevalence, the variation in severity of ED doesn't increase proportionately and varied according to individual characteristics. Correlation between serum lipids and ED is shown in table 3. The mean lipid profile TC, LDL, TG, HDL were 158.36 \pm 15.38 and 186.26 \pm 38.88; 97.06 \pm 16.98 and 119.33 \pm 31.94; 116.33 \pm 37.30 and 94.09 \pm 14.48; 50.18 \pm 7.05 and 44.08 \pm 8.13 respectively in patient without ED and with ED that were statistically significant ($p < 0.001$). However mean VLDL was 21.60 \pm 4.16 and 23.00 \pm 7.17; in patient without ED and with ED that was statistically insignificant.

DISCUSSION

Erectile dysfunction is one of the most common complications of diabetes and also one of the most underdiagnosed. It's a common misbelief of diabetic patients that ED is "in their heads" and that "their Doctor will dismiss any sexual problems they might bring up,"¹¹ it may be a relief for patients to learn that their ED is physical, related to their diabetes, and treatable.

In our present study, ED was present in about 78% of patients out of which 6% had mild ED, whereas 36% each were having moderate and severe ED. Various studies done previously had enumerated the prevalence of ED in DM patient from as low as 15% to as high as 90%.¹² This difference may be due to effect of other factor like age, duration of illness and associated complication. However despite this limitation it can be stated that ED is a very common problem affected as many as 75% of diabetics in some stage of life. In our study it was observed that prevalence of ED increase with increasing age. Prevalence increased from 20% from age group of <40 years to 100% in age group of >60 years. Most of the earlier studies have also reported significant correlation between ED and age. The effect of age on prevalence and severity of disease might be due to age related changes occurring in body as well as various other complications that may coexist in DM patient. Ultimately, it is the accelerated atherosclerosis which is common denominator for increased

Severity of ED	Erectile dysfunction	
	No of Patients	%
Absent	33	22
Mild	9	6
Moderate	54	36
Severe	54	36
Total	150	100

Table-2: Prevalence and severity of ED

Lipid Profile	ED	Mean	SD	SE	t	P
TC	Present(n=117)	186.26	38.88	6.23	2.312	0.025
	Absent(n=33)	158.36	15.83	4.77		
LDL	Present(n=117)	119.33	31.94	5.12	2.214	0.032
	Absent(n=33)	97.06	16.98	5.12		
TG	Present(n=117)	116.33	37.30	5.97	2.014	0.022
	Absent(n=33)	94.09	14.48	4.59		
HDL	Present(n=117)	44.03	8.13	1.30	2.278	0.027
	Absent(n=33)	50.15	7.05	2.13		
VLDL	Present(n=117)	23.00	7.17	1.15	0.616	0.541
	Absent(n=33)	21.60	4.16	1.25		

Table-3: Correlation between serum lipids and ED

prevalence of ED in DM patients. A significant correlation was also noted between duration of diabetes and ED. It was seen that with duration of diabetes <5 years the prevalence of ED was 56%, 92% with duration of 6-10 years and 100% with duration of disease >10 years. Almost similar results were noted by Mota et al in 2003.¹³ Although no direct correlation was observed between severity of ED and FBS however it was observed that as FBS increased so was the prevalence of ED. Some studies having larger no subjects such as that done by Thomas et al¹⁴ have also demonstrated a significant correlation between FBS and ED. Most significant finding of our study was the alarming dyslipidemia especially hypercholesteremia and raised LDL level in majority of patients having moderate to severe dyslipidemia irrespective of their duration and glycemic status of the patients. It was also noted that low level of HDL predisposes the patient to development of ED. Almost similar results were noted by Roumequere T et al.¹⁵

Some limitation of the study should be kept in mind while interpreting the results. Most important being the sample size. The results would be better and generalized with larger population sample. Secondly most of patient selected were from government hospital that belong to low-middle socioeconomic group. Improper dietary habits as well increased incidences of STDs are quite common that increase incidences of ED. Thus better outcome can be drawn by including patients from other sections of the society.

CONCLUSION

ED almost always has an organic or mixed etiology in diabetic men. This often results in diabetic men reporting more severe ED when they present for treatment of this condition. ED is a common complication of diabetes that affects patients' quality of life. While the etiology of this complication may be multifactorial in nature, it is clear that it usually has a strong organic component. Because men with diabetes value their erectile function highly, it is important that health care provider must encourage them to maintain good glycemic, blood pressure, and lipid control to minimize their risk of developing this complication. Moreover patients with dyslipidemia particularly hypercholesteremia, triglyceridemia or having lower values of HDL can be warned about the possible adverse effect on their quality of life as well as impending ED and other adverse outcomes including stroke as well as CV risk. Early monitoring and correction of dyslipidemia will not only improve the quality of life of DM patients but will also enable them to live a longer healthier life.

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The Mind-Body Connection: Cognitive Behavioural Therapy in Management of Temporomandibular Disorders

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ABSTRACT

Temporomandibular disorders (TMDs) can be defined as a heterogeneous collection of disorders marked by orofacial pain, masticatory dysfunction or both. TMDs can significantly impact the quality of life. The diagnosis and treatment of these disorders continue to perplex oral physicians. Current therapies for management remain only marginally successful and in some cases, they do not contribute to relief at all, raising the issue whether we are treating merely the symptoms of the disease and not the cause. The psychological component of this debilitating condition is frequently overlooked or ignored. The dynamic relationship between cognition and psychophysiological response is well proven. TMD patients show high rates of dysfunctional alteration and activity interference similar to other chronic pain syndromes. Cognitive Behavioral Therapy (CBT) is a modality that decreases maladaptive behavior and teaches adaptive coping. It has been shown to be effective in achieving a range of improvements in patients with chronic pain. In view of limitations of use of long term pain medication and TMJ surgery, a pragmatic approach seems to be inclusion of CBT as minimal intervention therapy for TMDs.

Keywords: Temporomandibular dysfunction, TMJ disorders, TMJ pain, Cognitive Behavioral Therapy, pain and cognition

INTRODUCTION

Temporomandibular disorders (TMDs) involve a group of symptoms associated with pain and dysfunction of the temporomandibular joint (TMJ) involving the masticatory system.¹ These disorders are also referred to as 'temporomandibular dysfunction', 'craniomandibular disorders' and 'mandibular dysfunction'. TMDs can be subdivided into muscular and articular categories. Differentiation between the two is sometimes difficult because muscle disorders may mimic articular disorders, and they may coexist. Symptoms range from mild pain and jaw dysfunction that may resolve over time to chronic conditions of intractable pain and limitations in jaw function that are severely debilitating.² A review of 18 epidemiologic studies found prevalence rates ranging from 16% to 59% for reported symptoms and 33% to 86% for clinical signs; a more recent meta-analysis of 51 prevalence studies registered even more extreme variations: 6% to 93% based on subjects' reports and 0% to 93% according to clinical assessments.³ Signs and symptoms of TMD are

in general more prevalent, more severe, and more long-lasting in women than in men, which to some extent may explain the preponderance of women among TMD patients.⁴

The pharmacological treatments tried in these patients include nonprescription pain relievers, anti-inflammatory agents, muscle relaxants, narcotic agents, antidepressants, anti-anxiety medications or surgical treatment methods. Non-pharmacological treatment has also been used as adjunct or monotherapy in patients (bite plane therapy, temporary or permanent occlusal therapy, orthodontic therapy, jaw exercises, thermal therapy, ultrasound therapy, transcutaneous electrical nerve stimulation (TENS) and acupuncture)⁵ Literature is replete with mention of cases which were refractory to all such treatment. Patients with TMD pain are similar to patients with other chronic pain syndrome, both including high rates of psychosocial dysfunction and activity interference.⁶ A number of other conditions occurred significantly more frequently among TMD affected individuals, including headaches, depression, fatigue, fibromyalgia, autoimmune disorders, sleep apnoea and gastrointestinal symptoms.⁴

To a large extent, these conditions remain poorly understood and there exists a plethora of approaches to diagnose and classify them. The RDC/TMD is a dual axis to assess and classify patients with TMD.⁷ The axis I measures physical diseases including persistent orofacial pain, limitations in mandibular range of motion, pain on masticatory muscle palpation and detectable sounds in the TMJ during jaw function, while axis II includes a 31-questionnaire to evaluate the psychological and psychosocial status of TMD patient, such as pain status variables, disability levels, depression and non-specific physical symptoms.

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Although, TMD is not a life threatening disease, the quality of life can be adversely impacted by the chronic nature of the pain. The psychological component of this debilitating condition is either overlooked by healthcare professionals due to preoccupation with treating the perceived etiology or ignored due to lack of familiarity with psychological assessment and counseling methods. The psychological co-morbidity has led to the question of whether treatment approaches need to be reformulated to adequately address this form of pain.

Cognitive Behavioral Therapy

Cognitive Behavioral Therapy (CBT) concerns with the psychological aspect of pain. CBT focuses on the interrelationships between cognition (emotion), actions (behaviors) and feeling(effect) and the role they play in a person's symptoms, functioning and quality of life.⁸ CBT works on the following principles: (1) The assumption that individuals feelings and behaviors are influenced by his or her thoughts; (2) The use of structured techniques to help individuals identifying and changing maladaptive thoughts and behaviors and (3) The emphasis on teaching skills that individuals can apply more liberally when facing problems. Researchers have demonstrated the effectiveness of cognitive behavioral skills training with TMD patients similar to conditions such as chronic back pain.⁹ Unfortunately CBT as therapy for TMD has not yet gained enough acceptance in clinical practice owing to lack of evidence in literature for its use. However, the complexity of this condition underscores the urgency to evaluate these domains rather than one that simply addresses the potential etiological mechanisms in a singular fashion. This article reviews the biopsychosocial moderation of chronic pain in TMDs and how CBT may be beneficial for effective management of this condition.

METHOD

Literature search was carried out using following keywords: Temporomandibular dysfunction, TMJ disorders, TMJ pain, Cognitive Behavioral Therapy, Pain and Emotion, Biopsychosocial perspective, chronic pain. Only articles published in English language were considered. A total of 100 articles were reviewed, out of which 40 were literature reviews, 41 were original studies and 19 were case reports.

DISCUSSION

The patient with temporomandibular joint dysfunction has been a part of dental practice for many years. Helkimo, a pioneer in TMD epidemiology, concluded that "symptoms of dysfunction of the masticatory system are more common than hitherto assumed. This implies that dentists in the future must interest themselves more than before for diagnosis and treatment of functional disturbances of the masticatory system in general practice."¹⁰ It is imperative to understand the pathophysiology of pain, transition from acute to chronic,

moderation by psychosocial factors and how it can be consequently managed by modifying them.

Biopsychosocial Model of Pain

Arguable the start of the modern era in chronic pain treatment began with the Gate Control Theory of pain (Melzack and Wall, 1965) which emphasized the importance of cognitive and effective as well as sensory influences on pain. The biopsychosocial model focuses on both disease and illness, with illness being viewed as the complex interaction of biological, psychological and social factors. The distinction between disease and illness is analogous to the distinction that can be made between nociception and pain. Nociception involves the stimulation of nerves that convey information about potential tissue damage to the brain. In contrast, pain is a subjective perception that results from the transduction, transmission and modulation of sensory information.¹¹

The biopsychosocial approach views pain and disability as a complex and dynamic interaction among physiologic, psychologic and social factors that perpetuate and may even worsen the clinical presentation. In stark contrast, the traditional biomedical approach assumes that symptoms have specific physical causes and attempts are made to eradicate the cause by rectifying the physical pathology or by cutting or blocking the pain pathways pharmacologically or surgically. Literature has consistently established that chronic pain can develop from the reinforcement of acute pain through operant conditioning. Feedback from the environment or social cues may facilitate or discourage engaging in pain behaviors.¹² It is suspected that the identification of psychological issues serves as an indicator that acute pain is becoming more chronic in nature.¹³

The biomedical approach traditionally has promised a cure or barring that, elimination of significant amount of pain. Currently though, there are no definitive cures for the most prevalent chronic pain syndromes. Holding out the promise for an elusive care adversely affects people with musculoskeletal pain because none currently exists. Rehabilitation rather than cure is the most appropriate therapeutic option.

Prevalance of co-morbid conditions

There has been a lot of research into recognizing a high rate of psychological co-morbidity in patients with TMJ dysfunction. Anxiety disorders represent a common syndrome comprised of both emotional and psychophysiological symptoms. Gatchel et al observed higher levels of anxiety among patients with acute TMD relative to those with chronic TMD. These and related findings underscore the notion that anxiety may represent a potential mechanism in the persistence of pain.¹⁵ Mood disorders including depression represent a common factor in chronic pain. Their presence influences numerous germane endpoints to pain patients including pain severity, pain-related disability, treatment response and quality of life. In one study, approximately 40% of TMD patients in their sample met criteria for clinical depression.¹⁶

Post-traumatic Stress Disorder (PTSD) is frequently observed in patients suffering from all forms of orofacial pain. Its prevalence is believed to be the second largest to depression and has been estimated to be around 10-30% in TMD. Gender differences have emerged from these data with females exhibiting a higher degree of TMD and PTSD symptoms compared to males. Consistent with other pain populations, the presence of PTSD in TMD increases the likelihood of a greater pain severity, lower pain threshold, poorer treatment outcomes, reduced functionality and a higher level of disability.¹⁷ Among acute TMD participants, those with multiple diagnoses (including MPDS) were more likely to report higher pain as well as more interference with daily activities due to pain relative to participants who did not have a TMD diagnosis.¹⁸ Other psychological constructs are also believed to influence pain symptoms. For example, stress burden has begun to receive increased attention as a pivotal variable in the manifestation and course of orofacial pain.¹⁹

Further, it underscores the potential etiological pathways in which pain emerges. For example, the presence of psychological distress may trigger muscular activity that eventually might elicit pain via mechanical pathways. The documented psychological co-morbidity also allows us to speculate that the processing of pain has been compromised by the same abnormal neurotransmitter imbalances observed in psychological disorders.²⁰

Pain and Cognition

Cognition refers to the subjects' ability to evaluate the significance of experience. It overlies the individuals learned behavior concerning the experience of pain. It may block, modulate or enhance the perception of pain. Proper manipulation of various environmental factors is required to help patient unlearn this behavior. In the initial stages of pain, the afflicted individual tends to believe that the sensation is directly associated with a particular cause or event (e.g. injury) and is temporary. However, upon the sustained presence of pain, the individual becomes aware of its permanence and adverse thoughts may develop.¹⁷ Individuals may fixate on the pain, which can create amplification of any pain stimulus that is experienced, a phenomenon known as 'Pain Catastrophization'.¹⁸ It is defined as dwelling on the worst possible outcome of any situation in which there is a possibility for an unpleasant outcome. It included three main psychological responses: (1) Rumination (2) Magnification (3) Helplessness. Somatization is a disposition or trait that manifests as the "tendency to experience and communicate somatic distress in response to psychosocial stress". Either of these traits can make it hard for the patient to cope with chronic pain and does lead to maladaptive behavior that makes it refractory in nature.

The increased attention to the role of cognitions in mood, anxiety and other psychological disorders sparked interest in incorporating cognitive therapy techniques into behavioral therapies for chronic pain. The techniques basically involve cognitive approaches such as¹⁹ (1) changing the patients'

conceptualization of pain management (2) changing self-defeating beliefs about pain (3) reversing the lifestyle affects of chronic pain and (4) help the patient set realistic goals. Behavioral strategies that can be instituted include: (1) encouraging the patient to test and extend his physical limits (2) encouraging the patient to carry out activities in spite of pain (4) encouraging 'Formal Relaxation' (5) help the patient set up a pain diary and (6) regular appointments with the professional for review.

Turk and colleagues hypothesized that patients who report emotional and physical difficulties would benefit more from a treatment that included cognitive therapy than from a similar comparison treatment that did not.²⁰ CBT, which encourages the patient to directly attend to and manage the pain problem may actually work less well for those high in somatization than a treatment that entails less focus on symptoms. Self-efficacy of the confidence to manage pain may also moderate treatment. Those with greater confidence in their ability to cope may more readily adopt and persist in the coping skills developed in CBT.²¹

In patients with TMD, somatization is related to more widely dispersed pain that is more severe and more difficult to localize and treat. It may be the case that the over concern with bodily symptoms interferes with the patients' ability to do the mental work. (e.g. reframing and problem solving) required by CBT.²² CBT may also be more effective than a more passive controlled treatment for those who demonstrate a "monitoring" coping style, i.e., the tendency to attend to threatening stimuli.^{23,24}

It appears that CBT works best for those who are best prepared to use it. It therefore, may be clinically useful to assess key constructs such as somatization, readiness and self efficacy to manage chronic pain and to add intervention components that will serve to increase readiness and boost self efficacy for managing TMD pain.

CONCLUSION

As reviewed above there have been quite a few studies that have examined treatment outcomes on TMJ disorders, most have major shortcomings in experimental design. Few systematic reviews of studies examining CBT in treatment of TMD specifically have been published. Integration of CBT into primary care settings offers much promise in both expanding application of CBT and improving outcomes. There is a clear and pressing need for well designed randomized control trials examining CBT in TMDs. Special attention must be paid to the following: (1) use of standardized diagnostic criteria for TMD such as RDC/TMD (2) adequate sample size for enhancing validity of results and (3) controlling of possible confounders. Ultimately, the testing of such a framework would allow researchers to determine whether the convergence of factors can lead to better integrative interventional approaches to treat the pain condition oftentimes perceived as treatment reticent.

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Effect of Gabapentin on Postoperative Pain, Nausea, Vomiting and Requirement of Analgesia in First 24 Hours in Patients Undergoing Laparoscopic Cholecystectomy Under General Anaesthesia - A Randomized Double Blind Placebo Controlled Study

Gopal Krishan¹, Rampal Singh², Karandeep Singh³, Malti Agarwal⁴, Lakhvinder Singh Kang⁵, Shaheen Begum⁶

ABSTRACT

Introduction: Postoperative pain, nausea, and vomiting are frequent and unpleasant adverse effects associated with anaesthesia and surgery. Objective of the study was to evaluate the effect of oral gabapentin on postoperative pain, nausea, vomiting and requirement of analgesia in first 24 hours (hrs) in patients undergoing laparoscopic cholecystectomy.

Materials and Methods: A total of 60 patients posted for laparoscopic cholecystectomy were included in this randomized double-blind placebo-controlled study. Patients were divided randomly into two groups (Group A and Group B) of 30 patients (n=30) each with the help of computer generated random number table. Group A patients received two doses of 300 mg gabapentin: first dose evening before surgery and second dose 2hrs before induction. Group B patients received matching placebo tablets of same size and shape as gabapentin tablets. All patients were observed for (pain measured by visual analogue scale, VAS), nausea, vomiting, need of opioids and antiemetics in first 24 hours postoperatively. In addition, Pulse Rate (PR), Non-Invasive blood pressure (NIBP); systolic blood pressure (SBP) and diastolic blood pressure (DBP) were analyzed pre and postoperatively.

Results: Both groups were comparable with respect to demographic profile ($p>0.05$). Change in PR and NIBP between the two groups were insignificant ($p>0.05$). Pain score in gabapentin group at 1,6,12 and 24 hours (hrs) postoperatively was significantly less than placebo group ($p<0.001$).

Conclusion: Administration of gabapentin evening before surgery and 2 hours before induction significantly decreased the incidence of postoperative pain, nausea, and vomiting.

Keywords: Laparoscopic cholecystectomy, gabapentin, postoperative pain, nausea, vomiting.

and is multifactorial. Although there are multiple definitions of pain, most experts agree that it is primarily a sensory experience.² There are two major components that contribute to postoperative pain, inflammatory and neuropathic pain. Both of these states share many common features and can be mitigated either jointly or separately.³ Opioids are the most popular analgesic agents used for the prophylaxis and treatment of postoperative pain. So, researches in this field are focused on finding new alternative drugs or drugs that can be combined with opioid to reduce the need for its use as opioids have many side effects.⁴ The other drugs currently used for treatment and prevention of PONV are prokinetics, dopaminergic antagonist, 5HT₃ antagonists, butyrophenones, anticholinergics, phenothiazines, antihistaminics, benzamides and steroids alone or in combination with other antiemetics.⁵⁻¹⁰

Gabapentin is an analogue of gamma aminobutyric acid and generally used as an antiepileptic agent.¹¹ It is used for neuropathic pain, diabetic neuropathy, postherpetic pain, and reflex sympathetic dystrophy.¹¹⁻¹³ It is an analgesic drug that can be affected directly by interaction with nociceptors in the central nervous system. Although the exact mode of its action is not known, gabapentin appears to have a unique effect on voltage-dependent calcium ions at the postsynaptic dorsal horns and may, therefore, interrupt the series of events that lead to experience of a neuropathic pain sensation.¹⁴ Gabap-

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INTRODUCTION

After laparoscopic cholecystectomy under general anaesthesia pain, nausea, and vomiting are the common complications which present a vexing challenge to anaesthesiologist. These symptoms have been reported in as many as 42%–72% of patients after laparoscopic cholecystectomy.¹ The etiology of postoperative nausea and vomiting (PONV) is complex

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entin is also effective in reducing the nausea and vomiting, which are induced by chemotherapy.¹⁵ There is evidence that tachykinin activity is a part of pathogenesis of chemotherapy induced emesis. Tachykinin neurotransmitter activity changes in response to gabapentin, which may be the possible mechanism. Therefore, the effects of tachykinin may be the mechanism leading to nausea reduction after surgery and chemotherapy.¹⁵

MATERIALS AND METHODS

This double-blind placebo-controlled study was conducted in the Departments of anaesthesia and critical care in Rohilkhand Medical College and Hospital, Bareilly. After approval from Institutional Ethical Committee, and written informed consent, total 60 patients were selected. The patients with uncontrolled diabetes mellitus, renal or liver diseases, concomitant diseases with nausea and vomiting, use of antiemetics in the 24hours before surgery, pregnancy, breast feeding, antidepressant use, and conversion from laparoscopic cholecystectomy to open cholecystectomy were excluded from the study. The primary outcome was the incidence of pain after laparoscopic cholecystectomy. The secondary outcome was the effect of gabapentin on postoperative nausea and vomiting. Patients were randomly divided into two groups using computer generated random number table. Group A patients received tablet gabapentin 300mg in the evening before surgery and 300mg, 2hrs before induction. Group B patients received a matching placebo (tablet) of same size and shape as gabapentin tablet. All patients were

induced with general anesthesia by using inj. Propofol (2mg/kg) and inj. Vecuronium bromide (0.1mg/kg). No analgesia or antiemetic was administered preoperatively.

The PR, SBP and DBP were measured preoperatively before induction and postoperatively after 1, 6, 12, and 24hrs in both the groups. Measurement of pain was done by using visual analogue scale, "VAS" (0-No pain, 10-Worst possible pain) in both the groups. Injection ondansetron and butorphenol were used as rescue antiemetic and analgesic medications, respectively, on as-and-when required basis postoperatively. The average number of analgesics and antiemetics used in first postoperative day i.e. for 24hours were calculated in both the groups.

STATISTICAL ANALYSIS

Statistical analysis was done by using paired and unpaired *t*-test. *P*-value <0.05 was considered as statistically significant and *p*<0.001 was considered as statistically highly significant.

RESULTS

A total of 60 patients were included in the study. All values were calculated in mean±SD. The mean age of patients receiving gabapentin (group A) was 36.0±5.05 years and in the placebo group (group B) was 37.0±5.95 years [Table.1]. The mean preoperative PR in groups A and group B was 80.5±2.54/minutes (min) and 84.7±3.19/min, respectively (*p*>0.05). The mean postoperative PR after 1, 6, 12, and 24hrs in gabapentin group (group A) was 87.7±2.91/min, 89.54±2.75/min, 82.4±1.94/min and 80.8±1.76/min, respectively, and in placebo group was 88.45±2.09/min, 85.2±1.97/min, 89.8±2.08/min, and 83.78±1.98/min, respectively. There were no statistically significant difference between the two groups (*p*>0.05). The preoperative SBP in gabapentin group and placebo group was 132.3±5.26 and 128.25±4.59 mmHg, (*p*>0.05). The postoperative SBP after 1, 6, 12, and 24hrs in gabapentin group was 129.7±3.54, 131.21±2.94,

Variables	Group A (n=30)	Group B (n=30)	<i>p</i> -value
Age (years)	36±5.05	37±5.95	0.78
Duration of surgery (minutes)	68±9.65	61±7.89	0.15
Duration of Anesthesia (minutes)	119±10.03	117±9.89	0.74

Table-1: Demographic profile

Parameters	Time of measurement				
	Preoperative	Postoperative			
		1hr	6hrs	12hrs	24hrs
PR/minute					
Group A	80.5±2.54	87.7±2.91	89.54±2.75	82.4±1.94	80.8±1.76
Group B	84.7±3.19	88.45±2.09	85.2±1.97	89.8±2.08	83.78±1.98
<i>p</i> -value	>0.05	>0.05	>0.05	>0.05	>0.05
SBP mmHg					
Group A	132.3±5.26	129.7±3.54	131.21±2.94	129.57±2.83	130.53±3.65
Group B	128.25±4.59	127.8±2.91	129.6±3.76	129.41±1.89	127.81±3.73
<i>p</i> -value	>0.05	>0.05	>0.05	>0.05	>0.05
DBP mmHg					
Group A	79.32±1.23	82.43±1.19	79.85±2.84	86.09±1.69	86.29±2.69
Group B	77.82±2.434	84.9±2.76	86.37±2.58	87.26±1.97	83.72±2.22
<i>p</i> -value	>0.05	>0.05	>0.05	>0.05	>0.05

Table-2: Change in Pulse Rate (PR) and Non-Invasive Blood Pressure (NIBP)

129.57±2.83, and 130.53±3.65 mmHg, respectively, and in placebo group was 127.8±2.91, 129.6±3.76, 129.41±1.89 and 127.81±3.73 mmHg, respectively. The preoperative DBP in group A and group B was 79.32±1.23 and 77.82±2.43mmHg, ($p>0.05$). The postoperative DBP after 1, 6, 12, and 24hrs in gabapentin group was 82.43±1.19, 79.85±2.84, 86.09±1.69, and 86.29±2.69 mmHg and in placebo group was 84.9±2.76, 86.37±2.58, 87.26±1.97, and 83.72±2.22 mmHg respectively. Intergroup SBP and DBP comparison was insignificant ($p>0.05$) [Table. 2].

Pain score was measured in both the groups using visual analogue scale (VAS), at 1,6,12 and 24hrs on first postoperative day. Pain score in gabapentin group and placebo group at 1,6,12 and 24hrs on first postoperative day was 6.12±1.05, 4.18±1.68, 2.49±1.03 and 0.36±0.45 and in placebo group were 8.17±1.25, 6.18±1.89, 4.17±1.09 and 1.37±0.95 respectively. Intergroup comparison was highly significant ($p<0.001$) [Table.3 figure.1]. Number of patients complaining vomiting were less in gabapentin group in comparison to placebo group ($p<0.001$) [Table. 4].

The average number of analgesics required on first postoperative day in gabapentin group and placebo group were 1.21±0.23 and 4.01±1.15 respectively; the comparison between the two groups was highly significant ($p<0.001$). The average number of antiemetics required on first postoperative day in gabapentin group and placebo group was 1.19±0.27 and 3.97±1.02 respectively. Intergroup comparison was highly significant ($p < 0.001$) [Table. 5].

DISCUSSION

Prevention and treatment of postoperative pain, nausea and vomiting are major challenges to anaesthesiologists in the post anaesthesia care unit (PACU). The present study was conducted to compare the effectsof oral gabapentin with placebo on postoperative pain, nausea, and vomiting in patients undergoing laparoscopic cholecystectomy. The mean age of patients in gabapentin and placebo group was 36±5.05 and 37±5.95 years respectively, which were comparable with previous studies by Soroushet *et al.*¹⁶ and Behdadet *al.*¹⁷ Vital signs such as PR, SBP,and DBP were assessed preoperatively and during first 24hrs after surgery at 1, 6, 12, and 24 hours. There was no significant difference between the two groups with respect to PR, SBP, and DBP. This is also observed by Behdad *et al.*¹⁷ proving that gabapentin did not alter pulse rate and blood pressure significantly at given doses. Pain score was significantly reduced on first postoperative day in the gabapentin group when compared with the placebo group. Our findings were consistent with the previous studies by Behdad *et al.*,¹⁷ Mohammadi *et al.*,¹⁸ Montazeri *et al.*¹⁹ and Dirks *et al.*²⁰ But it was not in accordance with the study by Bartholdy *et al.*²¹ where gabapentin had no effect on postoperative pain which can be due to ineffectiveness of gabapentin at low doses.

Prescribing gabapentin evening before surgery and before

Time after surgery (hours)	Group A (n=30)	Group B (n=30)	p-value
1	6.12±1.05	8.17±1.25	<0.001
6	4.18±1.65	6.18±1.89	<0.001
12	2.49±1.03	4.17±1.09	<0.001
24	0.36±0.45	1.37±0.95	<0.001

Table-3: Intensity of pain

Time after surgery (hours)	Group A (n=30)	Group B (n=30)	p-value
1	6	18	<0.001
6	2	12	<0.001
12	3	6	<0.001
24	0	1	<0.001

Table-4: Number of patients complaining vomiting

	Group A (n=30)	Group B (n=30)	p value
Rescue analgesia	1.21±0.23	4.01±1.15	<0.001
Rescue antiemetic	1.19 ± 0.27	3.97 ± 1.02	<0.001

Table-5: Requirement of number of analgesia and antiemetic

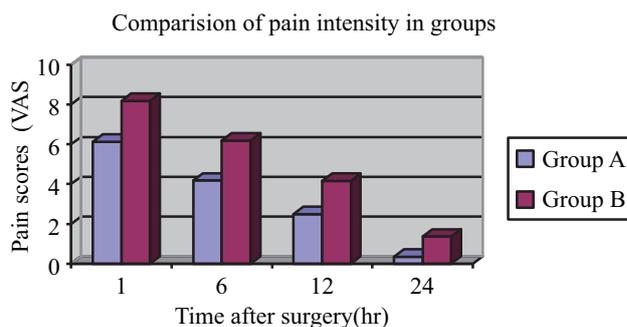


Figure-1: Comparison of pain scores (VAS) between two groups

induction resulted in decrease in average number of analgesics and antiemetics when compared with the placebo group in first 24hours postoperatively. This has been seen in previous studies by Soroush *et al.*,¹⁶ Pandey *et al.*²² and Khademi *et al.*²³ where gabapentin significantly reduced the incidence of postoperative nausea and vomiting and decreased the administration of antiemetics.

Like our study Rosarius *et al.*²⁴ used gabapentin 1200 mg orally, preoperatively to prevent postoperative pain after vaginal hysterectomy and noticed significant decrease in postoperative pain, nausea and vomiting. Turan *et al.*²⁵ also studied the use of oral gabapentin given preoperatively in patients of spinal surgery noticed significant reduction in incidence of nausea and vomiting compared to placebo. Furthermore Bashir *et al.* and Sharma *et al.* also reveals that gabapentin may prove to be effective in prevention of postoperative pain, nausea and vomiting.²⁶⁻²⁷

CONCLUSION

The use of gabapentin evening before surgery and 2hours before induction reduced the administration of postoperative

analgesics and antiemetics. However, additional studies are required to evaluate the magnitude of effect of gabapentin on postoperative pain, nausea, and vomiting.

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Acute Renal Failure in a Case with the Rare Bombay Blood Group

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ABSTRACT

Introduction: Bombay blood group is a very rare blood group. Individuals with the Bombay phenotype can receive only autologous blood or blood from another Bombay blood group. Transfusing other blood group to them can cause a fatal hemolytic transfusion reaction.

Case report: In this study, we report a case with the rare Bombay blood group that was misdiagnosed as the O blood group and developed a hemolytic transfusion reaction with acute renal failure and later completely recovered. This highlights the importance of typing in ABO blood grouping and standard cross-matching and performing standard pretransfusion laboratory tests in hospital blood banks in order to detect Bombay blood group.

Conclusion: Serum typing or reverse blood grouping along with O control cells and also antibody screening is the need of time.

Keywords: RBC-red blood cell, bombay blood group, transfusion reaction, acute renal failure

INTRODUCTION

Bombay phenotype is one of the rarest ABO blood groups. Blood group of an individual is determined by the antigen present on their surface. The antigens of ABO group (A, B, and H) consist of complex carbohydrate molecules. The expression of A and B antigens is determined by the presence of H antigen on precursor red blood cells. H antigen can be synthesized by H gene which is located on chromosome 19 and give rise to glycosyltransferase that add L-fucose to a precursor substance to produce H antigen on red cells. H antigen is an essential substance to A transferase or B transferase which are encoded by the ABO genes located on chromosome 9.¹ A and B transferases convert H antigen into either A or B antigens, respectively. Individuals with extremely rare Bombay phenotype fail to express H transferase. They cannot synthesize A or B antigens, and ABH antigens are absent from their red cells, regardless of their ABO blood group genotype.^{2,3} Since their red cells do not react with anti-A, anti-B, and anti-AB antisera, they can be recognized as the O blood group in cell typing. Their plasma contains anti-A, anti-B, and strong anti-H which can be hemolytic and is reactive with all blood types except the Bombay phenotype. As a result, individuals with the Bombay phenotype can only be safely transfused with autologous blood or other Bombay red cells

CASE REPORT

A 25-year-old woman was referred to our hospital with acute renal failure. Before admission to our hospital she was admitted to peripheral hospital and was diagnosed to have acute febrile illness and she was given blood transfusion with 'O' blood group.

During transfusion of O red blood cells in the peripheral hospital she developed nausea, restlessness, back pain, fever, and chills and latter after two days of blood transfusion her urine output decreased and she was referred to our hospital which is a tertiary referral hospital for kidney diseases. After admission to our hospital she was evaluated and was found to have mismatched transfusion reaction – unconjugated bilirubin was raised, indirect coombs test was positive, serum haptoglobin was low (<0.27gm/l), and serum LDH was raised. In reverse typing, her serum showed strong agglutination with O group control cells. The results of antibody identification showed the presence of a strong antibody which reacted with all panel cells through a wide thermal range with a negative autocontrol and she was diagnosed to have Bombay blood group. she had severe renal failure with a serum creatinine of 7.7, and calculated GFR<10 and she was oliguric. she was given eight sessions of hemodialysis and one blood transfusion with Bombay blood group was given since she had severe anaemia with hemoglobin of 5.4 and found to have iron deficiency anaemia. She completely recovered from renal failure within 25 days and her discharge serum creatinine was 0.9.

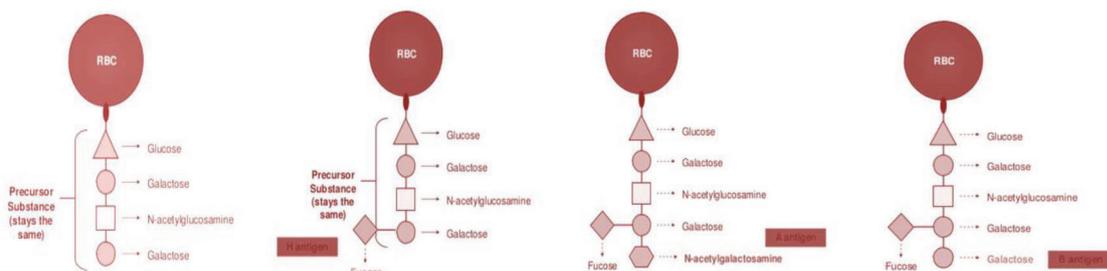
DISCUSSION

The Bombay phenotype was first explained in 1952 in India.^{1,4} The incompatibility of Bombay blood group with several O blood group donors has been explained. The prevalence of Bombay phenotype is very common in India (1:10,000)

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Structure of precursor RBC with initial H antigen formed by addition of fucose molecule. 'A' blood group with A antigen formed with N-acetylglucosamine addition and will have few H antigen. 'B' blood group with B antigen formed by adding galactose and will have few H antigen. AB blood group will have both A and B antigen and with were less H antigen. 'O' blood group have only H antigen. Persons with Bombay phenotype blood group will have no H,A,B antigen. But they will have anti-A, anti-B anti-H antibodies hence they will have incompatibility with all blood group transfusion except they are compatible only with another Bombay phenotype blood group.

Concentration of H antigen in various blood group is as follows, $O > A_2 > B > A_2 B > A_1 > A_1 B$

compared to other population like 1:10⁶ in Europe^{1,4}, in Caucasian with an incidence of one in 250,000.^{1,4} Individuals with the Bombay phenotype are easily misdiagnosed as the O blood group in cell typing because no A or B antigen on RBC surface and because of the presence of strong anti-H in their plasma, if they receive blood group O red cells or any other blood group red cells except the Bombay group, they may develop an acute hemolytic transfusion reaction. This reaction can cause acute renal failure or disseminated intravascular coagulation (DIC) which is associated with high morbidity and mortality rates.

CONCLUSION

Hence in order to decrease transfusion reaction in patient with Bombay blood group, serum typing or reverse blood grouping along with O control cells and also antibody screening in every blood bank should be done.

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Syndromic Approach to Diagnosis of Viral Thrombocytopenic Fever

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ABSTRACT

Introduction: Acute febrile illness with thrombocytopenia is quite common in the tropics. Most of them have a benign course with nonspecific symptoms. Dengue polymerase chain reaction (PCR) and viral cultures are expensive, time consuming and not feasible in all cases, especially in resource limited settings. Hence, in this study we have compared the clinical diagnosis of dengue illness according to CDC 2009 guidelines syndromic approach along with serological tests used routinely in the diagnosis of dengue.

Materials and methods: A total of 100 patients, admitted to our hospital during June 2015 to August 2015, with history of fever (>98.8 F), body ache and thrombocytopenia (platelets < 1.5 lakhs/cumm), were enrolled in the study. A careful history was taken followed by relevant systematic examinations. The patients who were tested positive for malarial parasite, chikungunya, leptospira or hanta virus, were excluded. After excluding other causes of fever and thrombocytopenia, 83 patients were classified according to CDC 2009 definition of dengue.

Results: We found that NS-1 and IgM were positive in 40% and 6.8% of the cases respectively in patients having dengue without warning signs in whom the mean duration of illness was 3 days. The same tests were found positive in 35.5% and 38.4% respectively in the category of patients who had warning signs where mean duration of illness was 6.5 days.

Conclusion: We concluded that the milder varieties of dengue illness should be managed according to CDC 2009 guidelines with a syndromic approach, after ruling out diseases with specific treatments such as malarial, leptospiral and rickettsial infections.

Keywords: Dengue, NS-1, polymerase chain reaction, CDC

INTRODUCTION

Acute febrile illness is extremely common in the tropics. The causes can range from treatable serious illnesses like falciparum malaria and leptospirosis to benign illnesses like non hemorrhagic dengue fever. Dengue is the most prevalent mosquito-borne viral disease; it is estimated that over 390 million dengue virus infections occur annually throughout the world.¹ Symptomatic dengue virus infection can present with a wide range of clinical manifestations ranging from fever to life-threatening shock syndrome or multiple organ dysfunction.² Since there is no specific antiviral treatment available, timely and early diagnosis plays an important role in patient management and implementation of control

measures.³ There are several reasons why early and accurate diagnosis of dengue is important. First, it can help in patient management by directing clinical attention to the appearance of major warning signs of severe or even life threatening complications. Second, an accurate dengue diagnosis prevents unnecessary and expensive antibiotic usage. Third, prompt diagnosis of index cases can facilitate mosquito control measures in the community, so as to reduce further transmission. Lastly, the expanded use of accurate dengue diagnostics provides important data on the epidemiology and health burden of dengue in the community; and in doing so, it helps inform and guide public health policies, especially when dengue vaccines and anti-virals are under development.⁴ In 2009, Centre of Disease Control had given its definitions for clinical diagnosis of dengue fever and the illness is clinically stratified as Dengue without warning signs, Dengue with warning signs and Severe Dengue.

Dengue without warning signs

Fever and any two of the following - Nausea, vomiting, Rash, Aches and pains, Leukopenia, Positive tourniquet test.

Dengue with warning signs

Dengue as defined above with any of the these - abdominal pain or tenderness, persistent vomiting, clinical fluid accumulation (ascites, pleural effusion), mucosal bleeding, lethargy, restlessness, liver enlargement > 2 cm; Laboratory: increase in HCT concurrent with rapid decrease in platelet count.

Severe Dengue

Dengue with at least one of the following criteria:

- Severe Plasma Leakage leading to:
 - Shock (DSS)
 - Fluid accumulation with respiratory distress
- Severe Bleeding as evaluated by clinician

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- Severe organ involvement
 - Liver: AST or ALT \geq 1000
 - CNS: impaired consciousness
 - Failure of heart and other organs

The diagnostic approach to Dengue can be syndromic or very specific. The interpretation of dengue diagnostic tests, adapted from Dengue and Control (DENCO) study, is as follows:

Highly suggestive

One of the following

1. IgM + in a single serum sample
2. IgG + in a single serum sample with a HI titre of 1280 or greater.

Confirmed

One of the following – 1) PCR+ 2)Virus culture+ 3) IgM sero-conversion in paired sera 4) IgG sero-conversion in paired sera or four-fold IgG titer increase in paired sera.

The utility of antigen detection tests such as NS1 antigen in diagnosis of dengue infection is not yet determined.

AIM AND OBJECTIVES

Aims and objectives of the study was to evaluate the diagnostic utility of syndromic approach in the management of milder forms of dengue fever, as defined by CDC 2009.

MATERIAL AND METHOD

A total of 100 patients, admitted to our hospital during June 2015 to August 2015, with history of fever (>98.8 F), body ache and thrombocytopenia (platelets <1.5 lakhs/cumm), were enrolled in the study. A careful history was taken followed by relevant systematic examinations. History of an intake of alternative forms of medicine such as papaya leaf extracts, which is very popular in this area, was also taken. However the exact amount of the extract and its concentration could not be quantified. The following investigations were done: Complete blood count, dengue serology (NS1 antigen, IgM and IgG antibodies), malarial parasite, malarial antigen test, IgM leptospira, IgM chikungunya; hanta virus serology in some cases when suspected; and serum procalcitonin when sepsis was suspected. The patients who were tested positive for malarial parasite, chikungunya, leptospira or hanta virus, were excluded. Patients suspected to be having haematological disorders were excluded from the study. After excluding other causes of fever and thrombocytopenia, 83 patients were classified according to CDC 2009 definition of dengue. They were divided into two groups – Group 1 included patients without warning signs and Group 2 included patients with the warning signs. Patients with severe dengue (CDC 2009) were excluded from the study. The clinical symptoms, signs and the laboratory parameters were studied in each group. We compared the syndromic approach based clinical diagnosis with the dengue serological tests, there by inferring the usefulness of these tests in the diagnosis of early dengue.

STATISTICAL ANALYSIS

Continuous variables were summarized employing mean and standard deviation and categorical variables were presented using frequencies and percentages. Chi square test was used to compare differences in proportions for categorical variables. *P* value less than 0.05 was considered as statistically significant. Data was entered and analysed using SPSS software (Version 20).

RESULTS

83 patients admitted to the medical wards were enrolled according to CDC 2009 definition of Dengue. Table-1 summarizes the clinical features of the patients at presentation.

Among the 70 patients who presented with vomiting prior to hospitalization, 60 (90%) patients gave history of consuming papaya leaf extract.

Patients were divided into two groups – Dengue fever without warning signs (Group-1) and dengue fever with warning signs (Group-2).

44 patients had Dengue fever without warning signs (Group 1) and 39 patients had dengue with warning signs (Group 2). The mean duration of illness in the first group was 3.2 days, and 6.5 days in second group. (Table-2). The mean platelet count at admission was 80,000 in group 1 and 45,000 in group 2. Mean packed cell volume (PCV) in group 1 was 40 % and that in group 2 was 48%. In the first group, 18 patients (40%) had NS-1 positive status and 3 patients (6.8%) tested IgM-positive for dengue. The remaining 19 patients (43.18%) were NS-1, IgM and IgG negative. In the second group, 14 patients (35.5%) tested positive for NS-1 antigen and 15 patients (38.4%) tested positive for IgM Dengue. 3 patients tested positive for IgG. 10 patients (25.6%) did not test positive for NS-1 or IgM.

We also compared the clinical profile between the patients who were seropositive and seronegative for dengue.(Table-3)

DISCUSSION

In this study we observed that dengue NS-1 was tested positive in 40% of the cases and IgM tested positive in 6.8% of the cases of early dengue (mean duration of illness 3.5 days).

Symptoms	Number of patients
Fever	80 (96.38%)
Arthralgia	75 (90.36%)
Headache	63 (75.9%)
Vomiting	70 (90%)
Pain abdomen	35 (42.16%)
Bleeding manifestations	06 (7.22%)
Diarrhoea	10 (12%)
Lab parameter	MEAN
Leucocyte count	3500/MM ³
Lowest platelet count	22,000/MM ³
Hematocrit	48

Table-1: Clinical features of the patients at presentation

	Mean duration of illness (days)	NS-1 positive	IgM positive
Dengue fever without warning signs	3.20	18 (40%)	3 (6.8%)
Dengue fever with warning signs	6.50	14 (35.5%)	15 (38.4%)

Table-2 Mean duration of illness and dengue NS-1 and IgM positivity

Clinical parameter	Dengue seropositive (N=53)	Dengue seronegative (N=30)	P value
Vomiting	42 (79%)	28 (93%)	0.12
Pain abdomen	20 (38%)	15 (50%)	0.11
Headache	34 (64%)	29 (97%)	0.091
Hypotension	2 (4%)	3 (10%)	0.21
Bleeding manifestation	4 (7.5%)	2 (6.7%)	0.35
Lowest platelet count	18000/mm ³	21000/mm ³	0.98
Hematocrit	48	46	0.76

Table-3: Comparison of clinical profile between dengue seropositive and seronegative groups

43% of patients did not test positive with both the tests in the early phases of dengue. In the second group, the mean duration of illness was 6.5 days. NS-1 tested positive in 35.5% of cases and IgM tested positive in 38.4% of cases.

52.2% of patients after 3 days of fever and 26% of patients at the end of 6 days of fever, tested negative for the commonly used serological tests such as NS1 antigen, IgM and IgG antibodies. When the clinical features, duration of hospital stay, the lowest platelet count and hematocrit values were compared between the seropositive and seronegative groups, no significant difference was found. The supportive treatment as well as the complications were similar in the two groups. The specificity and sensitivity of the serological tests do not seem to be uniform across various studies. According to the study conducted by Wang et al (2010) in South Korea, NS-1 was tested positive in 64% of patients with acute infection.⁸ In another study by Kassim et al (2011) in Malaysia, 32.2% of their patients tested positive for NS-1 antigen while, 40.9% were positive for IgM.⁹ Therefore, based on the results of these serological tests, patients should not be missed in the setting of dengue epidemics in resource limited areas. Chatterji et al (2011) suggested that WHO 1997 definition can be used to exclude dengue and NS-1 strip test can be used to confirm dengue.¹⁰ In our study, we also observed that there was no statistical significance in the presentation and clinical profile of the patients between seropositive and seronegative group. The syndromic approach incorporating the clinical definitions as per CDC should be used even if the serological results are negative after excluding common causes of fever in the region.

CONCLUSION

The clinical diagnosis based on syndromic approach is more appropriate in milder forms of thrombocytopenic fevers rather than trying to establish an exact guideline based diagnosis in appropriate geographical location and season (after rainfall) in the setting of primary care after ruling out diseases like malaria, leptospirosis and rickettsial infections. The unusually high prevalence of vomiting persisting for 2-3 days is probably related to the consumption of herbal treatments like papaya leaf extracts in the local population.

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A Study of Differences in Lipid Profile in Patients on Conservative Treatment and Hemodialysis

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ABSTRACT

Introduction: The magnitude of the problem has become more apparent as patients survive longer on maintenance hemodialysis. Coronary artery disease is seen in 26% of dialysis patients. Objective of the study was to note the differences in lipid profile in patients on conservative treatment and hemodialysis.

Material and Methods: A hospital based prospective study was carried out among 70 patients at Kasturba Medical College Hospitals and from Wenlock Government Hospital, Mangalore, from April 2001 to December 2003. Lipid profile of all patients was carried out.

Results: Among the 35 patients who were on conservative treatment 20 patients showed normal lipid profile, 15 patients showed abnormal lipid profile. Out of the 35 patients who were on dialysis, 26 patients showed abnormal lipid profile fraction and 9 showed normal lipid profile. This was statistically significant ($P=0.007$).

Conclusion: Because the lipid abnormalities in chronic renal failure accelerate the progression of the renal failure and predispose to atherosclerosis, it is worth while detecting and treating hyperlipidemia in these patients.

Keywords: Lipid profile, Patients, Hemodialysis

INTRODUCTION

The magnitude of the problem has become more apparent as patients survive longer on maintenance hemodialysis. Coronary artery disease is seen in 26% of dialysis patients.¹

In chronic renal failure the most prevalent lipid disorders are hypertriglyceridemia and decreased HDL concentration, LDL levels are usually normal or marginally increased. LDL isolated from uremic patients is a poor ligand for the LDL apoB receptors.²

The most accepted theory of atherogenesis postulates that lipoprotein taken from blood stream are taken by macrophages in the sub endothelial space leading to formation of cholesterol engulfed cells (foam cells) and they trigger a series of events leading to formation of atherosclerotic plaque.³ The arterial narrowing that follows impairs the blood supply to several organs heart, brain, kidney etc.

Therefore this study was planned to note the differences in lipid profile in chronic renal failure patients on conservative treatment and hemodialysis.

MATERIAL AND METHODS

Study was conducted in Kasturba Medical College Hospitals and from Wenlock Government Hospital, Mangalore with the Sample size of 70 patients. Study period was from April 2001 to December 2003.

Exclusion criteria: Known cases of diabetes and nephrotic syndrome and those patients who were not willing to participate in the study.

Laboratory procedures

1. Serum Triglyceride estimation

This was determined by the fully enzymatic U-V method as per the details shown in the system.

Test Principles

Triglycerides are hydrolysed by lipase to glycerol and free fatty acids. Glycerol is phosphorylated by ATP in the presence of glycerol kinase to glycerol-3-phosphate (G-3-P) which is oxidized by the enzyme glycerol 3-phosphate oxidase (G-P-O) producing hydrogen peroxide. Hydrogen peroxide so formed reacts with 4-aminoantipyrine/ 3,5 dichloro-2-hydroxy benzene sulfuric acid to give a red coloured complex which is read at 510 nm (500 – 530 nm). Normal value: 65-165 mg/dl.

2. Serum Total cholesterol estimation

This test was done on a method based on *Libermann – Burckhard reaction calorimetric method*.

Principle: Cholesterol esterase (CHE) hydrolyses cholesterol ester. Free cholesterol is oxidized by the cholesterol oxidase (CHO) to Cholest-4-En-3-one and hydrogen peroxide. Hydrogen peroxide formed reacts with 4-aminoantipyrine and phenol in the presence of peroxidase (POD) to produce pink colour. Normal cholesterol value: 150 – 250 mg/dl

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3. HDL – Cholesterol estimation

This involves two steps, precipitation and cholesterol estimation of the HDL – fraction by a modification of the method described by Burstein et al.

Principle: Chylomicrons, VLDL, and LDL were precipitated by adding phosphotungstic acid and magnesium ions to the sample. Centrifugation of the precipitant levels only the HDL in the supernatant (centrifugation done at 4000 rpm for a minimum of 30 minutes). The supernatant was separated out and its cholesterol content was determined enzymatically.

Normal values: Males: 35 – 55 mg/dl
Females: 45 – 65 mg/dl

In patients with high triglyceride values

The HDLc estimation was done after dilution of serum (1:1) with isotonic saline and the resultant cholesterol value of HDL was multiplied by 2. This was done to prevent the erroneous values of HDLc due to impaired sedimentation of the precipitate in a serum with high triglyceride concentration.

4. LDL-Cholesterol estimation

LDL cholesterol as calculated by using a standard WHO approved formula based on total cholesterol, triglyceride and HDL – cholesterol values.

Normal values: upto 150 mg/dl.

5. VLDL – Cholesterol

VLDL was calculated using the formulae: VLDL = Triglyceride level divided by 5.

		Normal	Abnormal	Total
Conservative	Count	20	15	35
	%	57.1	42.9	100
Dialysis	Count	9	26	35
	%	25.7	74.3	100
Total	Count	29	41	70
	%	41.4	58.6	100

$X^2 = 7.124$; $p = 0.007$ hs

Table-1: List of CRF patients who are managed conservatively and on maintenance hemodialysis

Lipid Profile	Group	N	Mean	Std. Deviation	t	P value
T. cholesterol	Renal fail	35	193.91	47.45	1.35	P = .181 ns
	Dialysis	35	209.00	45.87		
Triglycerides	Renal fail	35	141.77	65.59	3.71	P = .001 vhs
	Dialysis	35	195.82	55.70		
HDLc	Renal fail	35	39.34	7.67	3.66	P = .001 vhs
	Dialysis	35	33.85	4.43		
LDLc	Renal fail	35	126.21	48.46	0.90	P = .371 ns
	Dialysis	35	135.97	41.96		
VLDLc	Renal fail	35	28.35	13.11	3.71	P = .001 vhs
	Dialysis	35	39.16	11.14		
HDL/TC	Renal fail	35	0.21	6.78E-02	2.95	P = .004 hs
	Dialysis	35	0.17	5.60E-02		

Table-2: Lipid profile in chronic renal failure patients on conservative treatment and hemodialysis

In the absence of chylomicrons only three forms of lipoproteins are present in the sera – VLDL, LDL and HDL.

Since VLDL is the primary triglyceride carrying form in the fasting stage, its concentration can be approximated by dividing the amount of plasma triglyceride by 5 (based on the triglyceride to cholesterol ratio of VLDL).

Apart from the above mentioned trichemical assays, the other investigations set out in the proforma were carried out whenever necessary.

Age and sex wise distribution of serum lipids and lipoproteins were calculated with standard deviation. The correlation co-efficient was used to measure the association.

RESULTS

Total 70 cases of chronic renal failure patients were taken. Among the 35 patients who were on conservative treatment 20 patients showed normal lipid profile, 15 patients showed abnormal lipid profile. Out of the 35 patients who were on dialysis, 26 patients showed abnormal lipid profile fraction and 9 showed normal lipid profile. This was statistically significant ($P = 0.007$).

TC: The total cholesterol values in hemodialysis patients are increased as compared to patients on conservative treatment, 209.00 ± 45.87 and 193.91 ± 47.45 respectively. However this is statistically not significant ($P = 0.181$).

TG: There is significant rise in TG levels of hemodialysis patients as compared to patients on conservative treatment, 195.82 ± 55.70 and 141.77 ± 65.59 respectively. This is statistically highly significant ($P = 0.001$).

HDL: The HDL cholesterol levels are lower in hemodialysis patients as compared to patients on conservative treatment 33.85 ± 4.43 and 39.34 ± 7.67 respectively. This is statistically highly significant ($P = 0.001$).

LDL: The LDL cholesterol values are higher in hemodialysis patient as compared to patients on conservative management 126.21 ± 48.46 and 135.97 ± 41.96 respectively. However this is not statistically significant ($P = 0.371$).

VLDL: The VLDL cholesterol level in hemodialysis patients are increased as compared to patients on conservative treatment 39.16 ± 11.14 and 28.35 ± 13.11 respectively. This

is statistically highly significant ($P=0.001$).

HDL/TC: The HDL/TC ratio in hemodialysis patients is decreased, as compared to patients on conservative treatment, $0.17 \pm 5.60E-02$ and $0.21 \pm 6.78 E-02$ respectively. However this is statistically significant ($P=0.004$).

DISCUSSION

The results of comparative study of lipid profile in chronic renal failure patients on conservative treatment and hemodialysis showed increase triglyceride and VLDL levels and decrease in HDL levels were seen in hemodialysis patients compared to patient on conservative treatment. But total cholesterol, LDL was not raised significantly. HDL/TC ratio was decreased in hemodialysis patients.

Out of 70 CRF patients 35 patients were on continuous hemodialysis and 35 were on conservative management. The patients who were on hemodialysis were suffering from chronic renal failure from long time compared to patients on conservative management. Probably that might have contributed to increase number of lipid abnormalities in those patients.

The dialysate glucose, acetate buffer, heparinization in hemodialysis contributed to aggravation of hyperlipidemia.⁴ Glucose and acetate primarily contribute to aggravation of the hyperlipidemia.

Heparinization can deplete lipoprotein lipase (LPL) stores, hepatic triglyceride lipase (HTGL) and also inhibit LCAT.⁵ In this study triglycerides were markedly elevated in hemodialysis patients as compared to patients on conservative treatment and this was statistically significant ($P=0.001$).

Monzani et al., in their study showed hemodialysis patients had general worsening of the lipoprotein profile with elevated APO-E levels and indirect evidence of remnant accumulation. PTH did not have any significant influence on lipoprotein pattern. Increased insulin levels during HD might partly account for high triglyceride of these patients.

The results point to elevated Apo CIII, reduced Apo CII / Apo CIII and Apo E/ APO CII ratios as typical features of uremic hyperlipidemia and show that a defective triglyceride removal is the major pathogenic mechanism of uremic high triglyceride.

Hemodialysis treatment generally seems to worsen the lipid and Apo lipoprotein pattern observed in predialytic stage of CRF.⁷ M. Senti et al in their study on patients with CRF on HD had high triglyceride levels.⁶ Increased serum triglyceride levels have been well documented in patients on chronic maintenance hemodialysis.^{7,8}

HDL levels were significantly low in dialysis patients as compared to patients on conservative treatment and this was statistically significant ($P=0.001$). M. Senti, et al., their study of CRF patients on HD showed low HDL levels.⁶

Morena Marion, et al., in their study on hemodialysis patients states that hemodialysis patients are exposed to several

atherogenic factors resulting from qualitative and functional lipid abnormalities, including triglyceride rich particles, increased susceptibility to LDL oxidation and finally impairment of HDL protective effects.

The results suggest that qualitative abnormalities such as an impairment of HDL associated enzymes are associated with a decrease of HDL levels during hemodialysis.

Hence in addition to the known impairment of reverse cholesterol transport, the reduction of HDL protective capacity against oxidative stress could be involved in the development of HD induced atherosclerosis.⁹

The VLDL levels in chronic renal failure on hemodialysis were increased significantly compared to patients who were as conservative treatment. This increase was statistically significant ($P=0.001$).

J. Pedro-Botet in his study showed increased levels of VLDL fractions in hemodialysis patients. The possible rise of hypertriglyceridemia and changes in VLDL composition as risk factor for coronary heart disease remains a matter of dispute.¹⁰

The total cholesterol is marginally raised in hemodialysis patients as compared to patients on conservative management and it is not statistically significant ($P=0.181$). The LDL cholesterol was not raised significantly in dialysis patient as compared to patient on conservative management ($P=0.371$). It is statistically not significant.

The HDL/TC ratio is low in hemodialysis patients as compared to patients on conservative treatment ($P=0.004$) it is statistically significant.

Shah et al., showed low values of LDL cholesterol and total cholesterol in dialysis patients.⁴ DC Wheeler stated increased LDL cholesterol and hypercholesterolemia seen in hemodialysis patients.¹¹ According to King W. Ma, hypercholesterolemia rarely occurs in uremic and dialysed patients.¹²

CONCLUSION

On comparison of chronic renal failure patients on hemodialysis and patients on conservative treatment there is significant rise in triglycerides and VLDL cholesterol levels, however HDL cholesterol level were found to be significantly lower in hemodialysis patients as compared to patients on conservative treatment.

The significant rise in triglyceride and VLDL concentrations is the cause for increase cardiovascular abnormalities in CRF patients. Significant reduction in HDL and HDL / TC ratio are the important predictive indices for the risk of developing coronary artery disease in all groups of patients with chronic renal failure. This may be major contributory factor for enhanced atherogenesis in these patients.

Finally because the lipid abnormalities in chronic renal failure accelerate the progression of the renal failure and predispose to atherosclerosis, it is worth while detecting and treating hyperlipidemia in these patients.

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A Comparative Study of Induction of Labor with Intravaginal Misoprostol and Oxytocin

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ABSTRACT

Introduction : The maternal complications associated with premature rupture of membranes in term pregnancies are risk of cord prolapsed, infection and an unfavourable cervix for induction. Objective of the study was to compare vaginally administered misoprostol with intravenous oxytocin for induction of labor in women with premature rupture of membranes.

Material and Methods: The present study of induction of labor was carried out on 200 cases of pregnant women with premature rupture of membranes at which included: Group I: Intravaginal misoprostol (25 mcg): 100 cases and Group II: Oxytocin infusion group: 100 cases

Results: Multiparous women responded to induction quickly than nulliparous women. The caesarean section rate was double in the oxytocin group. The incidence of incoordinate uterine action was more in the oxytocin group when compared to the misoprostol group. The mean birth weight did not differ significantly in the two groups. No significant difference was found in the maternal morbidity pattern between the two groups.

Conclusion: The present study shows that intravaginal misoprostol can be used safely and effectively in women with premature rupture of membranes at term. The patient can be ambulatory without intravenous drip.

Keywords: Oxytocin, misoprostol, induction of labor

INTRODUCTION

Premature rupture of membranes at term is defined as spontaneous rupture of membranes after 37 weeks of gestation and before the onset of regular painful contractions. It occurs in approximately 10% of pregnancies. The latent period is the time interval between the rupture of membranes to the onset of labor. It varies on a host of factors like the presence or absence of infection, multiple pregnancy, polyhydramnios and to some extent the gestational age.¹

The average incidence of premature rupture of membranes is 10% of all pregnancies, but it varies from 2-18%.¹ Approximately 60-80 and of these cases of premature rupture of membranes occur in term pregnancies.² Membranes from pregnancies associated with premature rupture of membranes are less elastic than normal chorioamniotic membranes.³ Membranes that rupture prematurely may have different mechanical properties, such as decreased thickness and elasticity, decreased collagen synthesis and increased collagen-

olysis, compared with membranes that do not rupture prematurely.^{4,5}

The maternal complications associated with premature rupture of membranes in term pregnancies are risk of cord prolapsed, infection and an unfavourable cervix for induction. The latter is associated with a high incidence of dysfunctional labor, chorioamnionitis, and increased rate of caesarean section, postpartum hemorrhage and endomyometritis. Bruschi⁶ found an increasing incidence of maternal morbidity with increasing length of the latent period. 1.7% upto 24 hours increasing to 8.6% over 48 hours on term premature rupture of membranes patients.

Sacks and Baker quoted the incidence of maternal morbidity to be 1.3% when the latent period was less than 24 hours and 4.8% when it was longer than 24 hours. Lehberz and associates used prophylactic antibiotics and found the post partum morbidity to be significantly reduced in patients with term premature rupture of membranes. In the entire literature reviewed there were only 69 maternal deaths associated with premature rupture of membranes. It is apparent from the literature that the primary cause of death in almost all cases was sepsis.¹

Perinatal mortality is mainly due to sepsis and respiratory distress. In a study of premature rupture of membranes, the neonatal mortality was reported as 6.7% of which 55% was due to infection.⁷

The risk of neonatal infection after premature rupture of membranes is increased with prematurity and the presence of chorioamnionitis, especially if there was a prolonged interval between the first vaginal examination and delivery. The duration of draining prior to the onset of labor has not been shown to be significant in the development of neonatal sepsis though there is a risk of chorioamnionitis. The volume of amniotic fluid remaining after premature rupture of membranes is of importance as it possesses antibacterial activity. Neona-

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tal infection may manifest as septicaemia (4.9%), meningitis (3.4%), pneumonia (4.8%), pyoderma (3.6%), umbilical sepsis (3%) and conjunctivitis (23.1%).⁷

MATERIAL AND METHODS

The present study of induction of labor was carried out on 200 cases of pregnant women with premature rupture of membranes at which included:

Group I: Intravaginal misoprostol (25 mcg): 100 cases

Group II: Oxytocin infusion group: 100 cases

Women with cephalo pelvic disproportion, parity more than 5, post caesarean pregnancy, any moderate or severe pre existing medical disease such as cardiovascular disease or chronic renal failure, malpresentation, evidence of chorioamnionitis as determined by temperature > 100.4 degree F and the presence of uterine tenderness or foul smelling amniotic fluid, active herpes simplex infection, placenta previa or unexplained vaginal bleeding, any contraindication for the use of prostaglandin such as glaucoma or sickle cell disease or bronchial asthma were excluded from the study.

Misoprostol group

In the misoprostol group, 25 mcg of misoprostol was placed in the posterior fornix. Fetal heart rate were monitored every half an hour. The dose was repeated every 3 hours and was continued in the active phase of labor also till the patient delivered. The induction was stopped if the patient developed hyper stimulation or fetal distress.

The progress of labor was followed by a partogram. If there was no response even with 8 doses of misoprostol or on any evidence of fetal distress, it was considered as failed induction and LSCS was done.

The uterine contractions were monitored for any tachy systole, hypertonus and hyper stimulation syndrome.

Oxytocin induction group

Induction of labor was done with intravenous oxytocin drip after assessing the initial Bishop score and pelvic assessment.

Five units of syntocionon was added to 500 ml of 5% dextrose in primigravidae or 2.5 units of syntocionon in case of multigravidae was stated as IV drip. The drip rate was started with 6 mu/min inprimis and 4 mu/min in multis over a period of an hour until the patient developed three regular contractions in a period of 10 minutes and each contraction lasting for about 40-50 seconds with a period of relaxation in between, the maximum dosage of oxytocin given was upto 20 mu/min.

Clinical monitoring of patient was done as follows:

1. Hourly blood pressure and pulse rate
2. Two hourly temperature recording
3. Fetal heart rate every 15 minutes in the first stage and every five minutes in the second stage.
4. Uterine contractions, their intensity, frequency and du-

ration by external palpation.

If there was progress in labor, the induction with oxytocin was continued till delivery. If no response to induction was seen or any complications developed, the induction was stopped and an LSCS was done.

If the induction resulted in a vaginal delivery of a healthy child either naturally or helped out with forceps or vacuum extraction, it was a successful induction.

Failed induction was defined as no appreciable change in the cervix after eight hours of adequate uterine contractions or as no progressive increase in cervical dilatation after more than two hours in the active phase of labor.

The following observations were made and compared between the two groups.

1. Induction to delivery interval.
2. Mode of delivery
3. Maternal side effects
4. Neonatal side effects
5. Neonatal outcome
6. Success and failure rates
7. The patients in both the groups were kept in the hospital for one week after delivery for observation.

RESULTS

Table 1 shows induction delivery interval in nulliparous and multiparous women in both the groups. Nulliparous women: 56% of cases delivered within 9 hours and 88.8% of cases delivered within 12 hours in the misoprostol group. In the oxytocin group only 41% of cases delivered within 9 hours and 82% delivered within 12 hours. After 12 hours the effect was almost same in both the groups indicating response of uterus to prostaglandin is quicker than oxytocin.

Multiparous women: 83% of cases delivered within 9 hours in the misoprostol group and 67% delivered within 9 hours in the oxytocin group. After 9 hours, the effect was almost the same in both the groups. The mean induction delivery interval was 3.7 hours in the misoprostol group and 7.5 hours in the oxytocin group. Multiparous women responded to induction quickly than nulliparous women.

92% misoprostol treated women delivered vaginally ad 84%

Induction delivery interval	Misoprostol group		Oxytocin group (n = 58)	
	Nulliparous women (n = 54)	multiparous women (n = 46)	Nulliparous women (n = 58)	multiparous women (n = 42)
> 3 hours	2 (4%)	4 (9%)	2 (3%)	4 (10%)
3-6 hours	4 (7%)	28 (61%)	6 (10%)	8 (19%)
6-9 hours	24 (44%)	6 (13%)	16 (28%)	16 (38%)
9-12 hours	18 (33%)	6 (13%)	24 (41%)	10 (24%)
> 12 hours	6 (11%)	2 (4%)	10 (17%)	4 (9%)

Table-1: Induction delivery interval in nulliparous and multiparous women

oxytocin treated women delivered vaginally. 8% misoprostol treated women underwent caesarean section and 16% oxytocin treated women underwent caesarean section which shows that the caesarean section rate was double in the oxytocin group.

Table 3 shows that in the misoprostol group the maternal side effects were minimal when compared with the oxytocin group. The incidence of chorioamnionitis, fetal heart rate variations and puerperal pyrexia were similar in both the groups. The incidence of incoordinate uterine action was more in the oxytocin group when compared to the misoprostol group.

Table 4 shows the neonatal outcome in both the groups. The mean birth weights, the Apgar scores < 7 at 1 and 5 minutes and the percentage of infants requiring admission to NICU were similar in the two groups.

The neonatal complications were similar in both the groups. Meconium aspiration was more in the misoprostol group and jaundice in the oxytocin group.

DISCUSSION

The use of vaginal misoprostol reduced the duration of labor in the nulliparous women. No patient in the misoprostol group required oxytocin for augmentation of labor. This is in contrast to Wing et al study.⁸

No case of hyper stimulation was seen in the misoprostol group. Tachysystole was observed in two cases of oxytocin group and one case in the misoprostol group, in contrast to the studies of Sanchez R et al.⁹ The present study showed that low dose vaginal misoprostol is associated with lower rate of tachysystole and hyper stimulation. This finding was in accordance with Wing et al study.⁸

Post partum hemorrhage was observed in 4% of the oxytocin group. In the misoprostol group two cases had small cervical lacerations, leading to PPH of about 750 ml, which were sutured. The overall blood loss was reduced in the misoprostol group. Very few investigations have studied the incidence of PPH following induction with oral prostaglandin.¹⁰ They found no case of PPH in PGE₁ induced group as compared to 6 (12%) cases in oxytocin group.

The maternal and perinatal outcome was similar in both the groups. This is similar to the study of Wing et al⁸ and Sanchez R et al.⁹

The rate of forceps delivery was more among oxytocin group in the present study, the main indication being fetal distress in the 2nd stage of labor.

The mean birth weight did not differ significantly in the two groups which is similar to the study by Wing et al.⁸

The vaginal misoprostol was well tolerated in all cases and no patient developed nausea, vomiting or diarrhea. In the oxytocin group there were complications like thrombophlebitis and drip reaction.

No significant difference was found in the maternal morbidity pattern between the two groups. This finding is similar to that of Hannah ME et al.¹¹

Mode of delivery	Misoprostol group (n = 100)	Oxytocin group (n = 100)
Spontaneous	84	70
Vacuum extraction	4	4
Low forceps	4	10
Caesarean section	8	16

Table-2: Mode of delivery in the misoprostol and oxytocin group

Complications	Misoprostol group (n = 100)	Oxytocin group (n = 100)
Gastrointestinal	0	0
Drip reaction	0	3
Hyper stimulation	0	2
Tachysystole	1	2
FHR variations	10	12
Chorioamnionitis	1	2
Puerperal pyrexia	2	2
Thrombophlebitis	0	4

Table-3: Comparison of complications in the two groups

Neonatal outcome	Misoprostol group (n = 100)	Oxytocin group (n = 100)
Apgar < 7		
1 min	8	14
5 min	2	04
Mean Birth weight (kg)	2.7	2.85
Neonatal infection	1	1
Admission to NICU	6	10

Table-4: Comparison of neonatal outcome in two groups

neonatal complications	Misoprostol group (n = 100)	Oxytocin group (n = 100)
Birth asphyxia	8	10
Meconium aspiration	10	8
Jaundice	2	4

Table-5: Comparison of neonatal complications in two groups

CONCLUSION

The present study shows that intravaginal misoprostol can be used safely and effectively in women with premature rupture of membranes at term. The patient can be ambulatory without intravenous drip.

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A Study of Serum IgE Levels among Children of 6 Months to 5 Years of Age Group

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ABSTRACT

Introduction: Sometimes the immune system reacts unnecessarily vigorously against otherwise harmless environmental agents, allergens. These over reactions are termed hypersensitivity reactions and fall into four subgroups, type's I-IV, depending upon the mechanism behind the action. The type I hypersensitivity reactions are mediated by allergen specific IgE and are responsible for the clinical manifestation of atopic allergies, such as hay fever, food allergies, exzema, asthma and anaphylaxis, parasitic infections. Objective of the study was to study of serum IgE levels among children.

Material and Methods: Ethical clearance was obtained from Kamineni Hospital Ethics Committee. This was a Hospital based prospective observational study. Approximately 99 children (OP and IP) 6 months to 5 years of age, visiting Kamineni Hospital, LB Nagar, Hyderabad with recurrent respiratory tract illnesses meeting defined inclusion and exclusion criteria were enrolled in the study after taking an informed consent and approval of institutional ethical committee. All patients were subjected to detailed questionnaire. A thorough clinical examination was done. Blood samples were collected and total serum IgE levels were determined.

Results: Out of 99 children with RRTI studied, 48 had elevated serum IgE levels. Almost similar number of children with RRTI i.e. 51 had normal serum IgE levels. Serum IgE levels were significantly higher (66.07%) in males as compared to females (25.58%) with p value of 0.0003 ($p < 0.05$). The elevation of serum IgE levels was 48.48% in children (48 out of 99 children). It was noticed that, the number of children suffering from RRTI and the number of children with elevated serum IgE levels increased with increasing age. There was significant increase in serum IgE levels from 10% in infancy to 64.10% in 49-60th month with significant p value of 0.001.

Conclusion: This study showed increasing number of children with recurrent respiratory tract illness and serum IgE levels with increasing age.

Keywords: Serum, Children, IgE

lation is estimated at 2-2.5 days.⁴

Asthma is a chronic inflammatory disorder of the airways involving many cells and cellular elements. The inflammation causes swelling and narrowing of the airway restricting the capability of air to pass through to the lung tissue. The swelling and narrowing of the airways cause recurrent episodes of coughing, wheezing, breathlessness and chest tightness.¹ Sometimes the immune system reacts unnecessarily vigorously against otherwise harmless environmental agents, allergens. These over reactions are termed hypersensitivity reactions and fall into four subgroups, type's I-IV, depending upon the mechanism behind the action. The type I hypersensitivity reactions are mediated by allergen specific IgE and are responsible for the clinical manifestation of atopic allergies, such as hay fever, food allergies, exzema, asthma and anaphylaxis, parasitic infections.

MATERIAL AND METHOD

Ethical clearance was obtained from Kamineni Hospital Ethics Committee. This was a Hospital based prospective observational study. Approximately 99 children (OP and IP) 6 months to 5 years of age, visiting Kamineni Hospital, LB Nagar, Hyderabad with recurrent respiratory tract illnesses meeting defined inclusion and exclusion criteria were enrolled in the study after taking an informed consent and approval of institutional ethical committee. All patients were subjected to detailed questionnaire. A thorough clinical examination was done. Blood samples were collected and total serum IgE levels were determined.

Inclusion criteria

1. Age group > 6 months to < 5 years
2. Children with symptoms of recurrent respiratory tract infections defined as (at least one of the following should be met

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- a. > 6 respiratory infections per annum
- b. > 1 respiratory infections per month involving upper airways from September to April
- c. > 3 respiratory infections per annum involving lower airways

Exclusion criteria

1. Age less than 6 months and more than 5 years
2. Congenital heart disease
3. Cerebral palsy
4. Proven immunodeficiency disorder

Sample size: 99 children and Study period was from 1st March 2013 to 28th February 2014.

Investigations: Standard methods were used to draw the blood samples. The collected blood sample was transported immediately to laboratory. Serum IgE levels were measured by chemiluminescence method.

Statistical method used: Chi square test, Pearson coefficient analysis and other appropriate statistical methods.

RESULTS

The present study was undertaken to determine the correlation of serum IgE levels among children. A total of 99 children were included in the study. Out of 99 children, 48 had elevated serum IgE levels and 51 had normal serum IgE levels.

Out of 99 children with RRTI studied, 48 had elevated serum IgE levels. Almost similar number of children with RRTI i.e. 51 had normal serum IgE levels.

Serum IgE levels	RRTI	%
Elevated	48	48.48
Normal	51	51.52

Table-1: Association between serum IgE levels and recurrent respiratory tract infections (RRTI)

Sex	Elevated serum IgE levels	Normal serum IgE levels
Male (n = 56)	37 (66.07%)	19 (33.92%)
Female (n = 43)	11 (25.58%)	32 (74.41%)
Total (n = 99)	48	51

Table-2: Elevated serum IgE levels and Gender

Age group (months)	No. of RRTI children	No. of children with elevated serum IgE levels	% age with elevated IgE levels	P value
1-12	10	1	10%	0.12
13-24	14	3	21.4%	0.30
25-36	16	9	56.25%	0.07
37-48	20	10	50%	0.24
49-60	39	25	64.10%	0.001
Total	99	48	48.48%	

Table-3: Elevated serum IgE levels and age

Serum IgE levels were significantly higher (66.07%) in males as compared to females (25.58%) with p value of 0.0003 ($p < 0.05$).

The elevation of serum IgE levels was 48.48% in children (48 out of 99 children). It was noticed that, the number of children suffering from RRTI and the number of children with elevated serum IgE levels increased with increasing age. There was significant increase in serum IgE levels from 10% in infancy to 64.10% in 49-60th month with significant p value of 0.001.

DISCUSSION

In the present study, the number of boys with elevated serum IgE levels was more than girls, which was statistically significant ($p = 0.0003$). Similar results were seen in the studies done by Satwani et al⁵ (65%) and Borish L et al⁶ (66.5%). The factor responsible for this results could be that, the boys are more exposed to the outdoor activities, hence, increased chances of getting exposed to respiratory infections and allergens.

The number of children with elevated serum IgE levels significantly increased with increasing age with p value 0.01. This is in accordance with the study conducted in Greek children, by Petridou et al⁷, in children aged 1 month to 14 years, total serum IgE levels increased by almost 80% per year until 5 years of age. Similarly in a study by Johnson et al⁸ (USA), 60% increase in serum IgE levels was observed from birth to 4 years of age. Hamid Habib et al⁹ too had significantly increased serum IgE levels with increasing age with p value 0.001.

Serum IgE levels were significantly elevated (78.04%) in children who were weaned off earlier (before 6 months of age) with p value of 0.01. Similar results 60% elevation of serum IgE levels with early weaning was seen in the study by Satwani H et al⁵ with p value of less than 0.01 and little less, 50% elevation of serum IgE levels with early weaning were seen in Wright AL et al¹⁰ with p value of less than 0.005.

IgE appears to function as an enhancer of immune responses against antigens that are present at low concentrations. Intravenous administration of small protein antigens together with antigen specific IgE can induce antibody responses that are more than 1000 fold higher than those induced by antigen alone.¹¹ The response to IgE/antigen is strictly antigen specific, but not isotype specific, as it involves upregulation of IgM, IgG1, IgG2a as well as IgE responses. The proposed mechanism behind IgE mediated enhancement is endocytosis of IgE/antigen complexes via CD23 by B cells and presentation of antigen peptides to antigen specific T cells.¹¹ The ability of IgE to augment responses under suboptimal conditions is suggestive of a physiological function in early responses.¹¹ This together with the comparatively high turnover rate of IgE in serum, raises questions regarding the positive value of IgE. Does IgE function as a door keeper scanning the antigen repertoire of the environment and pre-

paring the individual for potentially harmful pathogens?¹² A rapid turnover may serve to adequately prepare the individual to deal with its present environment. Furthermore, surgery and other forms of tissue injury, such as burns and heart attacks, characteristically evoke a transient rise in serum IgE levels.^{13,14,15,16,17} Serum IgE levels appear to rise shortly after surgery, peak by day five and then decline again.^{14,17}

CONCLUSION

Elevated serum IgE levels were found in 48.48% of children with recurrent respiratory tract illness. Male to female ratio in recurrent respiratory tract illness with elevated serum IgE levels was 3.4:1. This study showed increasing number of children with recurrent respiratory tract illness and serum IgE levels with increasing age.

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A Study to Compare Efficacy of The Supraclavicular (Sc BPB) and Axillary (Ax BPB) Brachial Plexus Block

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ABSTRACT

Introduction: Surgical anaesthesia of upper limb can be obtained by neural blockade of brachial plexus. We can approach the brachial plexus at any point, right from the level of the nerve roots to that of isolated peripheral nerves. Supraclavicular approach is the most widely used method. When there is inability to use this approach due to local pathology or posture etc, the Axillary approach is another alternative, which is safe and easy to perform. Objective of the study was to compare the Supraclavicular and Axillary approaches using peripheral nerve stimulator.

Material and Method: In this study, 60 patients of ASA physical status grade I and II, scheduled to undergo operative procedures of upper extremity below distal end humerus were randomly divided into two groups, Sc BPB group and Ax BPB group, 30 patients in each group.

Results: Sc BPB group showed a longer duration of analgesia. Muscle relaxation was adequate in 90% of cases in both the groups. In Sc BPB group 6 % while in Ax BPB group 10 % cases had nerve sparing. Difference between both the groups was statistically insignificant. Accidental vessel puncture was seen in 10 % (3) cases in Sc BPB group while in Ax BPB group no complications were seen. No incidence of haematoma formation or pneumothorax was seen. No other complications were seen in either group.

Conclusion: Onset of action in Supraclavicular approach is faster than Axillary approach though both the techniques for brachial plexus block are safe and simple to perform due to easy surface landmarks. In both the groups motor action starts earlier than sensory

Key words: operative procedures, upper extremity, humerus

Though it is like old wine in new bottle, present study is designed to compare the Supraclavicular and Axillary approaches using peripheral nerve stimulator. The comparison is in terms of safety, nerve sparing, onset and duration of anaesthesia, and acceptability of the procedure by the patient and surgeon.

MATERIAL AND METHOD

In this study, 60 patients of ASA physical status grade I and II, scheduled to undergo operative procedures of upper extremity below distal end humerus were randomly divided into two groups, Sc BPB group and Ax BPB group, 30 patients in each group.

Inclusion Criteria

- Age limit 15-75 years
- Indoor cases
- Both emergency and planned operations
- The patients who were able to follow the instructions and were likely to cooperate for the operation were selected.

Exclusion Criteria

- Patients with hypersensitivity to local anaesthetic agents.
- Patients with neurological disturbances / personality disorders / mental illness.
- Patients with bleeding disorders
- Patients with skin infection.
- Patient's refusal for regional anaesthesia.
- Patients with full stomach

Technique

Supraclavicular approach for Brachial Plexus block

Method: Supraclavicular block was performed by single

INTRODUCTION

Surgical anaesthesia of upper limb can be obtained by neural blockade of brachial plexus. We can approach the brachial plexus at any point, right from the level of the nerve roots to that of isolated peripheral nerves.¹

Supraclavicular approach is the most widely used method. When there is inability to use this approach due to local pathology or posture etc, the Axillary approach is another alternative, which is safe and easy to perform.²

Earlier when these methods were performed with the parathesia technique the failure rates may be high. Now with the advent of peripheral nerve stimulator, localization of nerves has become easier and failure rates have dropped down.³

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injection technique of Kulenkampff with peripheral nerve stimulator.

Axillary approach for Brachial Plexus block

Method: Axillary block was performed by Winnie's technique, by single injection with peripheral nerve stimulator.

Operative conditions: The operative conditions like diagnosis, operative procedure, whether traumatic / non-traumatic, planned / emergency were recorded. The site of operation, bony / soft tissue involvement, use of traction / tourniquet, duration of operation were recorded.

The nerves were tested by the mnemonic of four P's^{2,3}

4 P's	Patient action	Nerve checked
Push	Extend arm with triceps	Radial
Pull	Flex arm with biceps	Musculocutaneous
Pinch	Fifth digit	Ulnar
Pinch	Index finger	Median

RESULTS

Table 1 shows the distribution of cases as per the requirement and duration of tourniquet / traction. Tourniquet was required in 31.66% (19 of 60) and traction in 41.66 % (25 of 60) cases. The tourniquet time (Mean \pm SD) was 81 \pm 31 min in Sc BPB group and 64 \pm 18 min in Ax BPB group. The traction time (Mean \pm SD) was 108 \pm 98.48 min and 27 \pm 38 min in Sc BPB and Ax BPB groups respectively.

Table 2 show the mean values of various parameters of the block action in the study cases. The onset of sensory action was 7.1 \pm 4.11 and 9.23 \pm 4.30 (Mean \pm SD) min in Sc BPB and Ax BPB groups respectively. The difference observed was statistically insignificant ($p > 0.05$). Onset of motor block (Mean \pm SD) was 7 \pm 4 min in Sc BPB group and 8.83 \pm 4.06 min in Ax BPB group. The difference observed was statistically insignificant ($p > 0.05$). In our study the onset of motor action was earlier than sensory action in both the groups. The difference observed was statistically insignificant ($p > 0.05$).

The onset of complete sensory blockade (Mean \pm SD) in Sc BPB group was 12.62 \pm 5.24 and 17.74 \pm 4.69 min in Sc BPB and Ax BPB groups respectively (z value = 3.98 and p value < 0.01). The mean onset of complete motor blockade in Sc BPB group was 13 \pm 5.58 and 17.74 \pm 4.69 min in Sc BPB and Ax BPB groups respectively (z value = 3.56 and p value < 0.01). The onset of complete sensory and motor blockade was early (on an average 5.12 min) in Sc BPB group as compared with Ax BPB group that was statistically significant.

Duration of analgesia was 849 \pm 249.49 and 756 \pm 187 min in Sc BPB and Ax BPB groups respectively. The difference between the two groups was statistically insignificant ($p > 0.05$).

Tables 3 – 4 C show the anaesthesia details of the two groups. Muscle relaxation was adequate in 90 % (27 of 30) and nerves were spared in 10 % (3 of 30) of patients in both the groups. Radial nerve sparing was observed in 6.66 % (2 of 30) and 10 % (3 of 30) in Sc BPB and Ax BPB group respectively. Ulnar nerve sparing was seen in 3.33 % (1 of 30) in Sc BPB group. Difference between both the groups was statistically insignificant.

Sedation was required in 10% (3 of 30) and 20 % (6 of 30) of patients in Sc BPB and Ax BPB group respectively. General anaesthesia was required in 10 % (3 of 30) in either group.

Table 5 shows the complications encountered in this study series. In Sc BPB group 10 % (3) cases had accidental vessel puncture while in Ax BPB group no complications were seen.

Table 6 shows that the procedure was acceptable both by the patients and surgeons in 100 % of cases in either group.

Discussion:

In the present study tourniquet was required in 31.66% (19 of 60) and traction in 41.66 % (25 of 60) cases. The tourniquet time (Mean \pm SD) was 81 \pm 31 min in Sc BPB group and 64 \pm 18 min in Ax BPB group. The traction time (Mean \pm SD) was 108 \pm 98.48 min in Sc BPB and 27 \pm 38 min in

Parameter	Sc BPB (N=30) (%)	Ax BPB (N=30) (%)	Total
Torniquet	15 (50%)	04 (13.33%)	19 (31.66%)
Torniquet time (min) (mean \pm SD)	81 \pm 15.5	64 \pm 18	
Traction	04 (13.33)	21 (70)	25 (41.66)
Traction time (min) (mean \pm SD)	108 \pm 49.24	27 \pm 38	
None	11 (36.66)	05 (16.66)	16 (26.66)
Total	30	30	60

Table-1: Distribution of cases as per use and duration of tourniquet / traction

Parameters	Sc BPB (N=30) (Mean \pm SD)(min)	Ax BPB (N=30) (Mean \pm SD)(min)	Z value	P value
Onset of sensory of action	7.1 \pm 4.11	9.23 \pm 4.3	1.96	NS
Onset of motor action	7 \pm 4	8.83 \pm 4.06	1.75	NS
Complete sensory blockade	12.62 \pm 5.24	17.74 \pm 4.69	3.98	< 0.01
Complete motor blockade	13 \pm 5.58	17.74 \pm 4.69	3.56	< 0.01
Duration of analgesia	849 \pm 249.49	756 \pm 187	1.63	NS

($z > 1.96$, $p < 0.01$ significant; NS: Non significant)

Table-2: Comparison of block action

Muscle relaxation	Sc BPB (n=30) (%)	Ax BPB (n=30) (%)
Adequate	27 (90%)	27 (90%)
Inadequate	03 (10%)	03 (10%)
Total	30	30

Table-3: Distribution of cases as per muscle relaxation

Nerve	Sc BPB (n=30) (%)	Ax BPB (n=30) (%)	Total (n=60) (%)
Musculocutaneous Nerve	0	0	0
Radial nerve	2 (6.66%)	3 (10%)	5 (8.33%)
Median nerve	0	0	0
Ulnar nerve	1 (3.33%)	0	1 (1.66%)
Total	3 (10%)	3 (10%)	6 (10%)

Table-4: Distribution of cases showing nerves spared

Complications	Sc BPB (n=30) (%)	Ax BPB (n=30) (%)	Total (n=60) (%)
Vessel puncture	3 (10%)	0	3 (5%)
Pneumothorax	0	0	0
Others	0	0	0
None	27 (90%)	30 (100%)	57 (95%)
Total	30	30	60

Table-5: Distribution of cases showing complications

Satisfaction (yes)	Sc BPB (n=30) (%)	Ax BPB (n=30) (%)	Total (n=60) (%)
Surgeon	30 (100%)	30 (100%)	60 (100%)
Patient	30 (100%)	30 (100%)	60 (100%)

Table-6: Distribution of cases showing satisfaction of surgeon and patient

Ax BPB group.

In our study in case of Supraclavicular block gentle massage of the area was done to make uniform spread. In Axillary block, distal pressure was maintained and arm adducted after the drug injection. This may be the reason for no musculocutaneous nerve sparing. All the patients with effective block in both groups tolerated tourniquet / traction well.

Our results are comparable with studies of Bennet Abraham⁴, Alon P. Winnie⁵, Ababou A⁶ who had used similar technique for axillary block in their study and had found that digital pressure and adduction of arm after giving drug improved the success rate.

In the present study the onset of sensory block was 7.1 ± 4.11 (Mean \pm SD) min in Sc BPB and 9.23 ± 4.30 min in Ax BPB group. The onset of sensory block was earlier in Sc BPB as compared to Ax BPB though the difference observed is statistically insignificant. The results of our study are comparable with the study of R. Pande⁷ et al, where the onset of sensory block was reported to be 8.2 ± 2.8 min in Sc BPB with nerve stimulator technique, while it was 8.3 ± 2.3 min in parathesia group. In our study the onset of motor action was earlier than sensory action in both the groups. The difference observed is statistically insignificant. Our results

are comparable with results found in studies of E. Lanzet⁸ and Tamilselvan P et al.⁹

In the present study the onset of complete sensory and motor blockade was early (on an average 5.12 min) in Sc BPB group as compared with Ax BPB group that is statistically significant. I have not found any references in relation to the comparison of onset of complete motor and sensory blockade.

In our study Sc BPB group showed a longer duration of analgesia. As the duration of operation was variable ranging from 10 minutes to 4 hours, the total duration of analgesia was measured from the time of block till the patient complained of pain postoperatively.

Tamilselvan P⁹ et al, in their study found postoperative pain relief (measured from the end of surgery until patient started complaining of pain) for 175-250 minutes (2.91- 4.16 h). They have used a combination of 1 % lignocaine with 0.125 % bupivacaine and 1:400,000 epinephrine.

Lawrence E. Schroeder¹⁰ et al, found no difference in duration of analgesia between Axillary (10 ± 7 h), Supraclavicular (8 ± 6 h), and Interscalene (9 ± 6 h) approaches. They reported prolonged analgesia with bupivacaine (13 ± 2.6 h) than with mepivacaine (8 ± 7 h). The probable reason for the prolonged duration of analgesia in our study may be due to the concentration of drug used. We used 0.5 % bupivacaine, 2 mg /kg body weight which has a longer duration of action (1.5 to 8 hours).¹¹

In the present study muscle relaxation was adequate in 90 % (27 of 30) of cases in both Sc BPB and Ax BPB groups. These cases were considered as successful block. In all these patients the anaesthesia was complete and satisfactory allowing optimal surgical conditions. In present study both groups had similar success rates.

In the Sc BPB group 1 patient (3.33 %) had ulnar nerve sparing and 2 patients (6.66 %) had radial nerve sparing. In the Ax BPB group 3 patients (6.66 %) had radial nerve sparing. Difference between both the groups is statistically insignificant. In our study none of the patients had musculocutaneous nerve sparing.

Bennet Abraham⁴ et al, in their study report sparing of musculocutaneous and radial nerves during axillary brachial plexus block. In the present study supplementation in the form of General Anaesthesia was required in 3 patients (10 %) in either group. These cases were considered as failure. Both the groups are comparable and the difference is statistically insignificant.

Brand^{1,12} et al, used inhaled N2O and barbiturates in a non-blinded fashion during surgery and success was considered to be tolerance of initial skin incision only. Lawrence E. Schroeder¹⁰ et al, used Midazolam, fentanyl for preoperative sedation. Intraoperatively, the additional sedatives were further supplementation by Midazolam, fentanyl, and propofol. In our present study we did not encounter any other major complications like haematoma formation or pneumothorax in both the groups. Our study results are comparable with

study of R. Pande⁷ et al. Brand¹² et al, had a higher rate of pneumothorax (6.1 %) in Sc BPB group. Haematoma formation was seen in 3 % of patients in Sc BPB group and in 2 % of cases in the Ax BPB group in their study.

In the present study the procedure was accepted both by the surgeons and all the patients. They were happy with the analgesia extending to the postoperative period. In the 10 % of cases (considered as failure) even though GA was supplemented, the patients were comfortable because they had postoperative analgesia. They did not have any complaints against the regional technique as such. All the patients were willing to accept regional blockade for similar surgical condition in future.

In the recovery room the patients were also asked about the block acceptability for any similar procedure in future. All the patients were ready. In the present study after the analysis and discussion of all the observation data, a success rate of 90% is seen in both the groups.

In the study of Brandet al,¹² success rate was 84.4 % in the Sc BPB group and 91.5 % in the Ax BPB group. Schroeder et al¹³ also found a higher success rate with the Ax BPP group (89%) as compared with Sc BPB group (78%) and Interscalene BPB group (75%). Thompson et al,¹ found no significant difference in block success between SCB (83%) and AXB (85%). Our study also showed no difference between the success rates in both the groups. The high success rate (90%) and lower incidence of complications may be attributed to the use of peripheral nerve stimulator in our study.

CONCLUSION

Onset of action in Supraclavicular approach is faster than Axillary approach though both the techniques for brachial plexus block are safe and simple to perform due to easy surface landmarks. In both the groups motor action starts earlier than sensory

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A Study to Assess The Efficacy of Lignocaine (Xylocard) for LMA Insertion and Stress Response in Adults Following Induction with Propofol

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ABSTRACT

Introduction: Laryngeal mask is a new concept in airway management. It is an ingenious supraglottic airway device, which is designed to maintain a seal around laryngeal inlet for spontaneous ventilation and allow controlled ventilation at the modest (<15cm of H₂O) positive pressure. Objective of the study was to assess the efficacy of Lignocaine (Xylocard) for LMA insertion and stress response in adults following induction with Propofol.

Material and Method: The study was carried out in 80 patients of age group of 20-60 years undergoing surgical, gynaecological and orthopedic operations. All patients were belonging to ASA grade II and I.

Results: After LMA insertion there was significant increase in heart rate in-Group B (p value < 0.001) and significant increase in the SABP in-Group B (P value highly significant) but no significant change in DABP. Conditions for LMA insertion were significantly superior in-Group A and there were no adverse airway reflexes during insertion of LMA. In-Group B patients 25% patients had less satisfactory conditions with coughing during LMA insertion. LMA insertion was possible in all patients in first attempt.

Conclusion: Insertion of LMA (laryngeal mask airway) leads to significant stress response and Inj. xylocard (Lignocaine 2%) 1.5mg/Kg body weight 90 seconds prior to induction decreases stress response of LMA insertion. This technique will definitely add to the safety of anaesthetic management of patients who are at increased risk of harmful effects of stress response.

Key words: Lignocaine, stress, propofol

INTRODUCTION

Laryngeal mask is a new concept in airway management. It is an ingenious supraglottic airway device, which is designed to maintain a seal around laryngeal inlet for spontaneous ventilation and allow controlled ventilation at the modest (<15cm of H₂O) positive pressure.¹ LMA also obviates need for intubation in some day care patients.

Endotracheal intubation requires laryngoscopy for visualization of larynx. Endotracheal tube exerts lateral pressure on the tracheal wall, which may provoke undesirable autonomic responses. LMA insertion obviates need for laryngoscopy, but similar and attenuated stress response is seen after LMA

insertion as compared to endotracheal intubation.²

Even this amount of stress can be harmful in some high-risk patients such as patients with history of ischaemic heart disease, hypertension and cerebrovascular diseases.

Smooth insertion of LMA requires attenuation of airway reflexes to avoid sequelae such as coughing, gagging and increase in heart rate and blood pressure. This has been most commonly achieved by using Propofol, which is now easily available. Propofol is undoubtedly a valuable agent for LMA insertion as it allows rapid induction and depresses laryngeal reflexes. But complete safety is not ensured even with Propofol and coughing and gagging is often seen.³

Lignocaine (Xylocard) given intravenously has been successfully used to decrease stress response and airway reflexes to tracheal intubation but its use with LMA is not popular. This study is designed to assess whether Lignocaine (Xylocard) given intravenously can improve conditions for LMA insertion and decrease stress response to LMA insertion.

MATERIAL AND METHODS

The study was carried out in 80 patients of age group of 20-60 years undergoing surgical, gynaecological and orthopedic operations. All patients were belonging to ASA grade II and I.

Exclusion Criteria

Following patients were excluded.

1. Morbidly obese.
2. Patients with high chances of aspiration-
 - a. Patients who were not nil by mouth.
 - b. Patients with increased intraabdominal pressure.
 - c. Pregnant patients with second or third trimester

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pregnancy.

3. Patients with reactive airway disease

Preanaesthetic Evaluation

It included a detailed history and physical examination. Investigations included routine blood and urine analysis and chest X ray and electrocardiogram in relevant cases. Written and informed consent was taken from all the patients.

Preoperative preparation included a period of overnight fasting.

Patients were randomly divided in two Groups, A and B.

Group A: Received injection Lignocaine (Xylocard) intravenously before giving injection Propofol.

Group B: Received equal volume of injection placebo (0.9% normal saline).

Technique: On arrival in the anaesthetic room, heart rate, oxygen saturation and non-invasive blood pressure monitoring were instituted.

Premedication: All patients of both Groups were premedicated with Inj Midazolam 0.03mg/kg; Inj. Pentazocine 0.5mg/kg, Inj Ranitidine 1mg/kg and InjMetoclopramide 0.2mg/kg body weight were given intravenously.

Inj. Glycopyrrolate 0.004mg/kg body weight was given intramuscularly 20 minutes before IV premedication. All patients were preoxygenated with 100% oxygen for 5 minutes. 90 seconds prior to induction, Group A received Inj. Lignocaine (Xylocard) 1.5mg/kg body weight intravenously. Group B received equal volume of 0.9% normal saline intravenously. Anaesthesia was induced with InjPropofol 2.5mg/kg body weight intravenously. Appropriate size of LMA was inserted. Cuff of LMA was inflated and LMA was connected to Bain's circuit for controlled ventilation. Patients were paralyzed with InjVecuronium 0.08mg/kg body weight (whenever required).

Anaesthesia was maintained on oxygen and nitrous oxide 50-50%. Intravenous Propofol infusion was given by triple dose regimen, 10mg/kg/hr for 10 minutes, 8mg/kg/hr for next 10 minutes, 6mg/kg/hr, thereafter.

A] Heart rate, blood pressure and oxygen saturation were

measured as follows:

- Before premedication
- Five minutes after premedication,
- After induction
- After LMA insertion
- Five minutes after LMA insertion
- Ten minutes after LMA insertion.

B] Pain of injection of Propofol was assessed postoperatively, with the help of grading scale by asking questionnaire to the patient.

- Grade 0-no pain.
- Grade I- mild discomfort,
- Grade II-significant pain.

C] Ease of insertion of LMA was graded as follows:

- Grade I – Successful insertion without any laryngeal reflexes
- Grade II- Successful insertion with laryngeal reflexes, like
 - Coughing
 - Gagging
 - Laryngospasm
 - Movements of limbs
- Grade III– unsuccessful insertion.

D] Any intraoperative or postoperative complications were noted.

RESULTS

Above Table shows intragroup comparison of changes in the heart rate after various interventions with the baseline value. It shows that, in-Group A there were no significant changes in the heart rate after induction (z value= 0.5), after LMA insertion (Z value = 0.83), and at five (Z value = 0.26) and ten (Z value = 0.16) minutes after LMA insertion.

In Group B, change in the heart rate after induction was not significant (Z= 0.34). After LMA insertion Heart rate increased significantly (P value< 0.001) over the baseline value and this increase was sustained at five (P value= <0.001) and ten minutes (P value< 0.001) after LMA insertion.

Variables	Group A (Z =)	Significance (P Value)	Group B (Z =)	Significance (P Value)
Baseline Vs after induction	0.5	NS	0.34	NS
Baseline Vs after LMA] Insertion	0.83	NS	10	< 0.001
Baseline Vs Five min after LMA insertion	0.26	NS	7.6	< 0.001
Baseline Vs Ten min after LMA insertion	0.16	NS	6	< 0.001
(z>1.96 significant: p<0.001 is significant)				
Table-1: Intragroup comparison of variations in the heart rate				

Variables	Group A (Z =)	Significance (P Value)	Group B (Z =)	Significance (P Value)
Baseline Vs after induction	2.31	0.01 (NS)	3.6	P=0.0002
Baseline Vs after LMA insertion	2.58	0.005 (NS)	6	P< 0.001
Baseline Vs Five min after LMA insertion	2.9	0.002 (NS)	3	P=0.001
Baseline Vs Ten min after LMA insertion	2.1	0.025 (NS)	1	NS
(Z>1.96 significant: p<0.001 is significant)				
Table-2: Intragroup comparison of variations in the systolic arterial blood pressure (sabp)				

Variables	Group A (Z=)	Significance P value	Group B (Z=)	Significance P value
Baseline Vs after induction	0.89	NS	1.9	NS
Baseline Vs after LMA insertion	1.89	NS	0.9	NS
Baseline Vs Five min after LMA insertion	2.16	0.02	0.6	NS
Baseline Vs Ten min after LMA insertion	2.45	0.008	0.4	NS
(Z>1.96 significant: p<0.001 is significant)				
Table-3: Intragroup comparison of variations in diastolic arterial blood pressure (dabp)				

Variables	Group A (Z=)	Significance P value	Group B (Z=)	Significance P value
Baseline Vs after induction	2.2	0.015 NS	2.25	0.014
Baseline Vs after LMA insertion	3	0.001 NS	3.23	0.0006
Baseline Vs Five min after LMA insertion	1	NS	3.4	0.0004
Baseline Vs Ten min after LMA insertion	1.1	NS	3.2	0.0006
(Z>1.96 significant: p<0.001 is significant)				
Table-4: Intragroup comparison of variations in mean arterial pressure				

Table 2 shows that compared to baseline, there was no significant change in the systolic arterial blood pressure in Group A after induction (p value = 0.01), after LMA insertion (P value 0.005), at five minutes (p value = 0.002) and ten minutes (P value = 0.025) after LMA insertion.

In-Group B, there was highly significant increase in the SABP after LMA insertion (Z = 6) and significant increase at five minutes after LMA insertion (P value = 0.001). At ten minutes after LMA insertion SABP had returned to baseline. Table 3 shows intragroup comparison of changes in the DABP. In both the Groups as compared to the baseline changes in the DABP were not significant at any time during the procedure.

In Group A, there was slight but non-significant increase in the MAP after induction (P value = 0.015) and after LMA insertion (P value = 0.001). Change in the MAP at five and ten minutes after LMA insertion was also not significant in Group A.

In Group B, change in the MAP after induction was not significant (P value = 0.014), but after LMA insertion there was significant increase in the MAP (P = 0.0006). Also at five (P value = 0.0004) and ten (P = 0.0006) minutes after LMA insertion increase in the mean arterial pressure was significant.

DISCUSSION

In Group A there were no significant changes in the heart rate after induction (z value= 0.5), after LMA insertion (Z value = 0.83), and at five (Z value = 0.26) and ten (Z value = 0.16) minutes after LMA insertion. In Group B, change in the heart rate after induction was not significant (Z= 0.34). After LMA insertion Heart rate increased significantly (P value< 0.001) over the baseline value and this increase was sustained at five (P value= <0.001) and ten minutes (P value< 0.001) after LMA insertion.

N. Braud and E.A.F. Clements (1989) studied pressor response to the LMA insertion. They demonstrated significant increase in the heart rate after LMA insertion (P value < 0.001) and this increase in heart rate was sustained at one

and three minutes after LMA insertion. The pattern of stress response obtained was comparable with the pattern stress response.²

I.G. Wilson, D. Fell, S.L. Robinson and G. Smith (1992) demonstrated the pattern of stress response to LMA insertion in their study, where they compared the stress response of LMA insertion to that of the endotracheal intubation. They noticed increase in the heart rate by 25% above the baseline after LMA insertion and heart rate started decreasing after ten minutes in LMA Group while it remained elevated in ETT Groups.⁴

M.D Stoneham, Bree and Sneyd (1995) demonstrated the effect of intravenous Lignocaine (Xylocard) on the stress response to LMA insertion. They reported a small but statistically insignificant change haemodynamics after LMA insertion in both study and control Groups.³

In Group B, there was highly significant increase in the SABP after LMA insertion (Z = 6) and significant increase at five minutes after LMA insertion (P value = 0.001). At ten minutes after LMA insertion SABP had returned to baseline. N. Braud and E.A.F. Clements (1989) studied LMA demonstrated significant increase in the SABP after LMA insertion (P value < 0.001), which attained significance at one minute after LMA insertion. (8.6% mean rise) and this increase in heart rate was sustained at three minutes after LMA insertion.²

The pattern of stress response obtained was comparable with the pattern stress response obtained in Group B patients in present study.

I.G. Wilson, D. Fell, S.L. Robinson and G. Smith (1992) demonstrated that though there is increase in the SABP after LMA insertion it does not reach the significance levels and it returned to baseline in short time after LMA insertion.⁴

M.D Stoneham, Bree and Sneyd (1995) demonstrated the effect of intravenous Lignocaine (Xylocard) on the stress response to LMA insertion. They reported a small but statistically insignificant increase in SABP after LMA insertion in both study and control Groups.³

In both the Groups as compared to the baseline changes in

the DABP were not significant at any time during the procedure.

N. Braud and E.A.F. Clements (1989) studied LMA demonstrated significant increase in the DABP after LMA insertion (P value < 0.001) The maximum mean rise in DABP was 11.8% and this increase in DABP was 14.2 % less than the ETT Group. This increase was sustained at three minutes after LMA insertion.²

I.G. Wilson, D. Fell, S.L. Robinson and G. Smith (1992) noticed that insertion of LMA produced no significant increase diastolic arterial pressure. The result was comparable with the present study.⁴

M.D Stoneham, Bree and Sneyd (1995) reported a small but statistically insignificant increase in DABP after LMA insertion in both study and control Groups.³

In Group A, there was slight but non-significant increase in the MAP after induction (P value = 0.015) and after LMA insertion (P value = 0.001). Change in the MAP at five and ten minutes after LMA insertion was also not significant in Group A.

In Group B, change in the MAP after induction was not significant (P value = 0.014), but after LMA insertion there was significant increase in the MAP (P = 0.0006). Also at five (P value = 0.0004) and ten (P = 0.0006) minutes after LMA insertion increase in the mean arterial pressure was significant. N. Braud and E.A.F. Clements (1989) demonstrated significant increase in the MAP after LMA insertion (P value < 0.001) and this increase in heart rate was sustained at one and three minutes after LMA insertion. The pattern of stress response obtained was comparable with the pattern stress response obtained in Group B patients in present study.²

I.G. Wilson, D. Fell, S.L. Robinson and G. Smith (1992) demonstrated no significant change in the MAP after LMA insertion.⁴ M.D Stoneham, Bree and Sneyd (1995) demonstrated a small but statistically insignificant increase IN MAP after LMA insertion in both study and control Groups.³ A prospective study of 1500 standardized LMA insertions by single experienced LMA user revealed a first attempt insertion rate of 95.5% and a failure rate after three attempts of 0.4%.⁵

Fibreoptic studies have shown that the LMA is stable during anaesthesia once it is placed correctly and fixed.⁶ Davitt et al (1994) demonstrated that ventilation through LMA is adequate at ventilation pressures varying from 15-30 cm of H₂O and comparable to ventilation through endotracheal tube. Leak fractions were consistently higher than for ventilation through endotracheal tube and increased with increasing airway pressure.⁷

Berry and Varghese reported no air leak with tidal volumes of 10ml/kg.⁸ Haden et al (1993) used technique of intermittent positive pressure through LMA in 93 patients with only two significant clinical problems.⁹

Safety of LMA in non-supine positions has not been demonstrated in large controlled trials. The prone position may be associated with an increased risk of regurgitation, but not

necessarily aspiration. Uneventful LMA use has been reported in 300 prone patients.¹⁰

S. McClune, M Regan, and J Moor described the use of LMA in a patient for emergency caesarean section when the tracheal intubation was not possible. The anaesthesia was maintained with the cricoid pressure in order to avoid aspiration.¹¹

CONCLUSION

Insertion of LMA (laryngeal mask airway) leads to significant stress response and Inj. xylocard (Lignocaine 2%) 1.5mg/Kg body weight 90 seconds prior to induction decreases stress response of LMA insertion. This technique will definitely add to the safety of anaesthetic management of patients who are at increased risk of harmful effects of stress response.

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Study Comparing Dexmedetomidine and a Combination of Fentanyl, Midazolam and Diclofenac Sodium on Hemodynamics, SpO₂ and Surgeon-Patient Comfort in Tympanoplasty Surgeries

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ABSTRACT

Introduction: Monitored anaesthesia care involves administering a combination of drugs for anxiolytic, hypnotic, amnesic, and analgesic effect. Ideally it should result in less physiological disturbance and allow for more rapid recovery than general anaesthesia. Objective of the study was to compare Dexmedetomidine and a combination of Fentanyl, Midazolam and Diclofenac sodium on hemodynamics, SpO₂ and surgeon-patient comfort in tympanoplasty surgeries.

Material and Method: A prospective double blind study of dexmedetomidine and a combination of fentanyl, midazolam and diclofenac on hemodynamics, SpO₂ and surgeon-patient comfort in 150 patients of tympanoplasty surgeries was carried over a period of two years at Nova ENT hospital Hyderabad. Tympanoplasty surgeries are preferably performed under monitored anaesthesia care. 150 patients were randomly divided into 2 groups. Group D receiving dexmedetomidine bolus of 1mcg/kg/bw for 10 min followed by infusion at a rate of 0.04mcg/kg bw/min and group C patients received the combination drugs of fentanyl 2mcg/kg/bw, midazolam 0.02mg/kg/bw and diclofenac sod of 1mg/kg/bw.

Results: In group D, more patients (16%) have experienced a fall in systolic blood pressure of more than 20% compared to only 5.3% of patients in group C. In group D, more patients (12%) have experienced a fall in diastolic blood pressure of more than 15% compared to only 8% of patients in group C. It was observed that the SpO₂ level of patients in group D i.e. receiving dexmedetomidine was satisfactory and majority had higher levels as compared to patients in the group C.

Conclusion: Dexmedetomidine group patients were found to be more comfortable.

Key words: dexmedetomidine, blood pressure, SpO₂

INTRODUCTION

Monitored anaesthesia care involves administering a combination of drugs for anxiolytic, hypnotic, amnesic, and analgesic effect. Ideally it should result in less physiological disturbance and allow for more rapid recovery than general anaesthesia. It typically involves administration of local anaesthesia in combination with IV sedatives, anxiolytic and analgesic drugs which is a common practice during various ENT surgical procedures. Tympanoplasty in ENT surgical procedures involves reconstruction of perforated tympanic

membrane with or without ossiculoplasty. It is usually done under local anaesthesia with sedation under monitored anaesthesia care (MAC) or general anaesthesia. Patients may feel discomfort due to pain, noisy suction, manipulation of instruments and head and neck position. There are many advantages of local anaesthesia supplemented with intravenous sedation, such as less bleeding, cost effectiveness, postoperative analgesia, faster mobilisation of the patient, and the ability to test hearing intraoperatively.¹

Dexmedetomidine is the most recent agent in this group of α_2 agonists approved by FDA in 1999 for use in humans for analgesia and sedation⁴⁻⁸, sympatholytic and haemodynamically stabilizing properties. It is increasingly being used as a sedative for monitored anaesthesia care because of its analgesic properties, "co-operative sedation", and lack of respiratory depression. Although safe bradycardia and hypotension are the most predictable and frequent side effects. Dexmedetomidine has shown to consistently reduce anaesthetic requirements. In particular this review focuses on dexmedetomidine utilization as an infusion in Spine surgeries and ENT surgeries and to compare the efficacy of two different doses of dexmedetomidine infusion on intraoperative hemodynamics, requirement of anaesthetic agents and post operative sedation and analgesia.²

MATERIAL AND METHOD

A prospective double blind study of dexmedetomidine and a combination of fentanyl, midazolam and diclofenac on hemodynamics, SpO₂ and surgeon-patient comfort in 150 patients of tympanoplasty surgeries was carried over a period of two years at Nova ENT hospital Hyderabad. Tympano-

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noplasty surgeries are preferably performed under monitored anaesthesia care. 150 patients were randomly divided into 2 groups. Group D receiving dexmedetomidine bolus of 1mcg/kg /bwfor 10 min followed by infusion at a rate of 0.04mcg/kg bw/min and group C patients received the combination drugs of fentanyy 2mcg/kg/bw, midazolam 0.02mg/kg/bw and diclofenac sod of 1mg/kg/bw. Maximum fall in systolic blood pressure, diastolic blood pressure over the length of time of surgery as a percentage in comparision to the pre-operative values was noted. Similarly maximum change in SpO2 was also recorded. Surgeon and patient comfort index was calculated based on the responses of them to a questionnaire and assessment was also recorded and compared in the 2 groups. All data was analysed for statistical significance.

Surgeon’s comfort index scores

Index	Response	Points
Blood less fields	Blood less	4
	Fair blood loss	3
	Disturbing blood ooze	2
	Troublesome bleeding	1
	Surgery abandoned	0
Patient state	Immobile and co-operative	2
	Moving and un co-operative	1
	Converted to GA	0
patient complaining of pain needing further LA administration	No	2
	Yes	1
	Converted to GA	0
ability to communicate with patient	Easily	2
	With extra effort	1
	Not possible as pt is very drowsy	0

If the response of the surgeon to the questionnaire reveals 7 to 10 points surgeon was considered comfortable and if the scoring was less than 7, surgeon was considered uncomfortable.

Patient comfort index

Index	Number / response	Points
Visual Analogue Scale (VAS)	9 or 10	2
	7 or 8	1
	Less than 7	0
Patient state	Relaxed and sleepy	1
	Anxious and agitated	0
Arousability of patient	easily arousable	1
	Arousable with loud verbal or physical means	0

Patient is regarded as comfortable if the score is 4 or 5 and uncomfortable if the score is less than 4.

RESULTS

It was found that more patients i.e. 24% and 70.7% in the

group C had experienced fall up to 15% and 15-20% respectively than the patients in the group D. But in group D, more patients (16%) have experienced a fall in systolic blood pressure of more than 20% compared to only 5.3% of patients in group C (table 1).

Similarly for fall in diastolic blood pressure, it was found that more patients i.e. 25.3% and 66.7% in the group C had experienced fall up to 10% and 10-15% respectively than the patients in the group D. But in group D, more patients (12%) have experienced a fall in diastolic blood pressure of more than 15% compared to only 8% of patients in group C (table 2).

Table 3 shows a comparison of SpO2 level in both the groups. It was observed that the SpO2 level of patients in group D i.e. receiving dexmedetomidine was satisfactory and majority had higher levels as compared to patients in the group C. When Surgeon’s comfort index scores were compared in both the groups, it was found that there was not much difference. Thus the surgeon’s were comfortable equally with both the group patients (table 4).

It can be seen from table 5 that patients in both the groups were equally comfortable with either of the drug they received.

Maximum fall in systolic BP	No. Of patients in group D	No. Of patients in group C
Up to 15%	14 (18.7%)	18 (24%)
15 – 20%	49 (65.3%)	53 (70.7%)
More than 20%	12 (16%)	04 (5.3%)
Total	75 (100%)	75 (100%)

Table-1: Comparison of fall of systolic blood pressure (BP) in the two groups

Maximum fall in diastolic BP	No. of patients in group D	No. of patients in group C
Up to 10%	13 (17.3%)	19 (25.3%)
10 – 15%	53 (70.7%)	50 (66.7%)
More than 15%	09 (12%)	06 (8%)
Total	75 (100%)	75 (100%)

Table-2: Comparison of fall of diastolic blood pressure (BP) in the two groups

SpO ₂ level	No. Of patients in group D	No. Of patients in group C
Up to 95	53 (70.7%)	24 (32%)
90 – 94	16 (21.3%)	42 (56%)
Less than 90	06 (8%)	09 (12%)
Total	75 (100%)	75 (100%)

Table-3: Comparison of SpO2 level in the two groups

Surgeon’s comfort index scores	No. of patients in group D	No. of patients in group C
7 – 10	71 (94.7%)	73 (97.3%)
Less than 7	04 (5.3%)	02 (2.7%)
Total	75 (100%)	75 (100%)

Table-4: Comparison of Surgeon’s comfort index scores in the two groups

Patient comfort index score	No. of patients in group D	No. of patients in group C
4 – 5	73 (97.3%)	74 (98.7%)
Less than 4	02 (2.7%)	01 (1.3%)
Total	75 (100%)	75 (100%)

Table-5: Comparison of Patient comfort index score in the two groups

DISCUSSION

150 patients were randomly divided into 2 groups. Group D receiving dexmedetomidine bolus of 1mcg/kg /bw for 10 min followed by infusion at a rate of 0.04mcg/kg bw/min and group C patients received the combination drugs of fentanyl 2mcg/kg/bw, midazolam 0.02mg/kg/bw and diclofenac sod of 1mg/kg/bw.

We found that for maximum fall of systolic and diastolic blood pressure, more number of patients in the Group D receiving dexmedetomidine were having fall of more than 20% and 15% respectively. But for SpO₂ levels, these group patients were having better levels when compared to the patients in the group C who received the combination drugs of fentanyl 2mcg/kg/bw, midazolam 0.02mg/kg/bw and diclofenac sod of 1mg/kg/bw. From the point of view of comfort index of surgeon's and patients, we observed that there was no significant difference in the comfort index of the two groups.

Neha Garg et al² carried out a study among 60 patients who were randomly divided into 2 groups. Group A (inj. Dexmedetomidine 0.2 µg/kg/hr) and Group B (inj. Dexmedetomidine 0.4µg/kg/hr). They noted that fall in systolic BP was 15.7% in Group B compared to 3.5% reduction in Group A with respect to baseline. Difference was statistically very highly significant (p<0.001). The reduction in diastolic blood pressure was 13% in Group B compared to 3% in Group A. Difference was statistically very highly significant (p<0.001).

Padmaja A et al¹ observed that the mean sedation score in group D who received Dexmedetomidine was 3.18±0.19 and in other it was (group M) 3.03±0.21.(p>0.05). Intra operative heart rate and mean arterial pressure in group D were lower than the base line values and the corresponding values in group M (p<0.05).No of patients receiving rescue fentanyl were more in group M(2 patients 1dose,5 patients 2 doses),in group D only 2 patients required single dose of rescue analgesic fentanyl(p<0.05).

Ayoqlu H et al³ in their study found that Group SD receiving Dexmedetomidine had less bleeding and lower bleeding scores (P < 0.05). In addition, this group received less intra-operative fentanyl (P < 0.05). Aantaa R et al⁴ reported that the MAC of isoflurane was 0.85% end-tidal in the control group, 0.55% end-tidal with the low dose of dexmedetomidine, and 0.45% end-tidal with the high dose of dexmedetomidine.Ghodki PS et al⁵ concluded that Dexmedetomidine is an effective anesthetic adjuvant that can be safely used in

laparoscopy without the fear of awareness under anesthesia. Khan ZP et al⁶ concluded that dexmedetomidine decreased isoflurane requirements in a dose-dependent manner and reduced heart rate, systolic and diastolic arterial pressures. Sedation and slight impairment of cognitive function persisted for several hours after anaesthesia and the end of infusion of dexmedetomidine. Isoflurane did not appear to influence the pharmacokinetics of dexmedetomidine.

Feld JM et al⁷ reported that during surgery, desflurane concentrations necessary to maintain the bispectral index at 45 to 50 were decreased, and blood pressure and heart rate were lower with in the dexmedetomidine compared with fentanyl group. In the postanesthesia care unit, pain scores and morphine use were decreased in the dexmedetomidine group. Durmus M et al⁸ found that Dexmedetomidine decreased bleeding, postoperative analgesic requirements and intra-operative anaesthetic requirements and was associated with more stable haemodynamic responses to anaesthesia. Jalonen J et al⁹ observed that Intraoperative intravenous infusion of dexmedetomidine to patients undergoing coronaryartery revascularization decreased intraoperative sympathetic tone and attenuated hyperdynamic responses to anesthesia and surgery but increased the propensity toward hypotension.

Bakhamees HS et al¹⁰ noted that the intraoperative infusion of dexmedetomidine decreased the total amount of propofol and fentanyl required to maintain anesthesia, offered better control of intraoperative and postoperative hemodynamics, decreased postoperative pain level, decreased the total amount of morphine used and showed better recovery profile compared with placebo.

Aho M et al¹¹ observed that Dexmedetomidine infusion did not completely abolish the need for isoflurane but diminished its requirement by > 90% (P = 0.02). Venn RM et al¹² stated that from the clinician's and patient's perspectives, dexmedetomidine is a safe and acceptable sedative agent for those requiring intensive care. The rate pressure product is reduced in patients receiving dexmedetomidine, which may protect against myocardial ischaemia. Dexmedetomidine reduces the requirement for opioid analgesia.

Arain SR et al¹³ concluded that Dexmedetomidine may be useful for perioperative sedation. It has a slower onset and offset of sedation compared with propofol. Dexmedetomidine was associated with improved analgesia and less morphine use in the postoperative period.

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Role of Trans Rectal Ultrasonography in Evaluation of the Prostate

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ABSTRACT

Introduction: The biopsy rate for both TRUS and DRE was available only in the study done by Lee et al. They reported that a biopsy was recommended in 3.7% (29 out of 784) of the men tested by DRE and in 7.9% (62 out of 784) of the men tested by TRUS. Thus, both the detection and biopsy rate were approximately twice as high with ultrasonography. Objective of the research was to study the role of trans rectal ultrasonography in evaluation of the prostate

Material and Methods: This hospital based cross sectional study was conducted for a period of 18 months. 40 patients of age 35 to 80 years were evaluated by transrectal ultrasonography using a 7.5 MHz endorectal probe. Institutional Ethics Committee permission was obtained and informed consent was taken from the patients before they were recruited in the study.

Results: Five patients showed evidence of hypoechoic lesions in the peripheral zone and were diagnosed as prostatic carcinoma. One patient had irregularly enlarged prostate gland. One out of 40 patients were diagnosed as chronic prostatitis.

Conclusion: transrectal ultrasonography was found to be more sensitive than the digital rectal examination.

Keywords: Evaluation, Trans rectal ultrasonography, Sonograms

INTRODUCTION

Watanabe and associates have proposed diagnostic criteria for the purpose of differentiating the prostatic disorders which were later approved as the official criteria of the Japan Society of Ultrasonics in Medicine and the Japanese Urological Association.¹

In 1985, Lee and associates established the Hypoechoic lesion as a sign of the cancer focus and this had great impact on the advancement of early cancer detection by transrectal ultrasonography.²

In 1988, Watanabe and associates have undertaken a mass screening program for prostatic disease with transrectal ultrasonography. They have screened 6529 men over the age of 55 years detecting 42 cases of prostatic carcinoma (0.6%) and 1405 cases of benign prostatic hyperplasia - 21.5%.³

Lee and associates conducted the largest published screening trial with transrectal ultrasonography and co-workers who screened 784 self-referred men using both digital rectal examination and transrectal ultrasonography. Overall 77 biopsies were done, 83% initiated by transrectal ultrasonography and 38% by digital rectal examination. Cancer was detected

in 22 patients or 2.8% of the men screened. Digital rectal examination detected 10 tumors and transrectal ultrasonography detected 20 tumors (2.6% of the men screened). They suggested that transrectal ultrasonography (TRUS) is twice as sensitive as digital rectal examination (DRE) in detecting small prostatic cancers.⁴

The biopsy rate for both TRUS and DRE was available only in the study done by Lee et al. They reported that a biopsy was recommended in 3.7% (29 out of 784) of the men tested by DRE and in 7.9% (62 out of 784) of the men tested by TRUS. Thus, both the detection and biopsy rate were approximately twice as high with ultrasonography.²

MATERIAL AND METHOD

This hospital based cross sectional study was conducted for a period of 18 months. 40 patients of age 35 to 80 years were evaluated by transrectal ultrasonography using a 7.5 MHz endorectal probe. Institutional Ethics Committee permission was obtained and informed consent was taken from the patients before they were recruited in the study.

Patients presenting with symptoms of prostatism either in the form of irritative symptoms or obstructive symptoms, patients with abnormal digital rectal examination in the form of asymmetry of the gland, tenderness and presence of hard nodules were included in the study.

All the patients were investigated on WiproGE Logic 400 MD Ultrasound machine. The transducer used for the study is an end-viewing transducer with variable frequency ranging from 5-7.5 MHz that allows for multiplanar imaging in semi-coronal and axial projections. The transducer is provided with a stainless steel biopsy guide and attachments for TRUS guided biopsies of the prostate. Data was entered in the Microsoft Excel Sheet and analyzed.

RESULTS

Out of 40 patients who underwent trans rectal ultrasonogra-

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TRUS Observation	Number	%
Normal TRUS morphology	13	32.5
Benign prostatic hyperplasia	20	50
Prostatic carcinoma	06	15
Chronic prostatitis	01	2.5
Total	40	100

Table-1: Results of trans rectal ultrasonography

Studies	Prostate cancer detection by DRE*	Prostate cancer detection by TRUS#
Lee et al ²	1.3% (10 out of 784 patients)	2.6% (20 out of 784 patients)
Present study	2.5% (1 out of 40 patients)	15% (6 out of 40 patients)

*Digital rectal examination, #Trans rectal ultrasonography

Table-2: Comparison of results of carcinoma of prostate

phy of the prostate 13 patients showed normal zonal anatomy of the prostate, with no evidence of any focal lesions and the size of the gland in all these patients was below 25 grams. These patients were reported as normal trans rectal ultrasonography of the prostate gland. Digital rectal examination was also normal in all the patients. None of these patients were subjected to biopsy or PSA level estimation.

Five patients showed evidence of hypoechoic lesions in the peripheral zone and were diagnosed as prostatic carcinoma. All these patients showed no evidence of any palpable nodules of Digital rectal examination. All these patients had serum PSA levels of more than four ng/ml. All these five patients were subjected to trans rectal ultrasound guided biopsy and the diagnosis was confirmed on histopathological examination.

One patient had irregularly enlarged prostate gland. Without any evidence of hypo echoic or hyper echoic lesion and was diagnosed as prostatic carcinoma (iso echoic). Prostate was palpable in this patient by digital rectal examination. He also had PSA level of 16 ng/ml. This patient was subjected to trans rectal ultrasound guided biopsy and the diagnosis was confirmed by histopathological examination. This patient had evidence of extra capsular extension with involvement of bladder base and seminal vesicles.

One out of 40 patients were diagnosed as chronic prostatitis based on ultrasonographic features described in the literature. Trans rectal ultra sonography of this patient showed irregular calcific densities both in the central gland and peripheral zone. This patient had tender prostate gland on digital rectal examination and experienced some degree of pain during the trans rectal ultrasonography procedure.

We found that the detection rate of prostate cancer by Trans rectal ultrasonography WAS 15% compared with only 2.5% of detection rate with Digital rectal examination. Lee et al² also found that the detection rate for prostate cancer was only 1.3% by Digital rectal examination compared to an almost double i.e. 2.6% of detection rate for prostate cancer by Trans rectal ultrasonography method. Thus Trans rectal ultrasonography is superior to the digital rectal examination method.

DISCUSSION

The present study was conducted on patients with age group ranging from 35 to 80 years. All these patients presented with urologic symptom and were referred to the Radiology department for evaluation of the prostate by Trans rectal ultrasonography.

All the patients were subjected to thorough digital rectal examination prior to being subjected Trans rectal ultrasonography.

Of the six patients who were confirmed of having prostate cancer, one patient showed hard indurated prostatic gave a value of 2.5% cancer detection rate for digital rectal examination. In the study conducted by Lee et al² the cancer detection rate for digital rectal examination was 1.3% (10 out of 784 patients studied).

Trans rectal ultrasonography had detected five patients with hypo echoic lesions and one patient with iso-echoic lesion in the peripheral zone; and all of them were diagnosed as prostatic carcinoma or surgical biopsy in the present study giving the cancer detection rate of 15% (6 out of 40 patients). In the study conducted by Lee et al² the cancer detection rate by Trans rectal ultrasonography was 2.6% (20 out of 784 patients studied). In another study conducted by Wanatabe et al³ who screened 6529 men over the age of 55 years, 42 cases were diagnosed as prostatic carcinoma with a cancer detection rate of 0.6%. In the study carried out by Lee et al² the cancer detection rate by Trans rectal ultrasonography was twice as that of digital rectal examination. In the present study, the cancer detection rate was 2.5% (1 out of 40 patients studied) and by Trans rectal ultrasonography it was many time more i.e. 15% (6 out of 40 patients studied).

Of the six prostatic cancers diagnosed in the present study, five patients showed hypo echoic lesion and one patient showed iso echoic lesion comprising of 83% and 17% respectively. In a study conducted by Shinohara et al⁵ on 98 patients of prostatic carcinoma, 67% were found to have hypo echoic lesions and 32% were identified as having iso echoic lesions where as only one percent showed evidence of hyper echoic lesion.

Kelly IM et al⁶ in their study on 456 patients with possible prostate cancer found that The frequency of malignancy was 47% (75 of 158). Of 136 TRUS-positive cases, 72 were malignant and 64 benign. Of 84 CDI-positive cases, 65 were malignant and 19 benign (chi 2 = 12.18, P < .001). Thirteen percent of histopathologically proved cases (10 of 75) were normal at CDI. TRUS alone had a sensitivity of 96% and a positive predictive value (PPV) of 0.53. The addition of CDI increased the PPV to 0.77 but reduced the sensitivity to 87%. In only one case out of 158 did CDI suggest the diagnosis of malignancy independently of TRUS.

TRUS alone has limited potential to identify PC because of frequent multifocality of cancer within the prostate, the variable sonographic appearance of prostatic tumors, the poor specificity of focal US abnormalities, and the substantial

percentage of isoechoic PC. Over the past decade, the sextant biopsy technique has emerged as the standard of care in the detection of PC. However, limitations in cancer detection have been appreciated, particularly a false-negative rate approaching 20%. This high failure rate has led investigators to refine biopsy techniques to improve cancer detection and to increase the total number of cores. Currently, recommendations include increasing the biopsy number to a minimum of 10-12 cores, including sampling of the lateral prostate. Refinements in imaging technologies (power Doppler sonography, microbubble intravenous sonographic contrast agents, and MR spectroscopy or dynamic contrast MR imaging) should eventually improve targeting of prostate needle biopsy and reduce false-negative biopsies.⁷

Tang J et al⁸ found that Transrectal ultrasonographically guided biopsy of the hypoechoic lesions revealed prostate cancer in 30 patients and benign prostatic diseases in 36.

Tayib AM et al⁹ observed that Out of the 45 patients who underwent TRUS guided biopsy; cancer of the prostate was detected in 13 (28.8%). The cancer detection rate in patients presented with abnormal DRE alone was 7.6%, and was 15.3% in the group with elevated

Ukimura O et al¹⁰ in their study concluded that MR-TRUS fusion-image-guided biopsies outperformed systematic biopsies. TRUS-visibility of a MR-suspicious lesion facilitates image-guided biopsies, resulting in higher detection of significant cancer.

Maxeiner A et al¹¹ reported that Real-time MR/US fusion increases detection rates of PCa in patients undergoing repeat biopsy. Especially, clinically significant PCa with a Gleason score ≥ 7 were almost exclusively detected by MR/US fusion-guided biopsy.

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Role of Honey in Post operative Tonsillectomy Cases

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ABSTRACT

Introduction: Honey has been used since ancient times for healing of skin wounds and preventing infections. The aim of this study is to evaluate the effect of honey on pain, infection and wound healing in post operative tonsillectomy cases.

Materials and Methods: 40 patients planned for tonsillectomy under general anaesthesia were taken up in the study. 20 patients in the study group were given oral honey post operatively along with other medication whereas remaining 20 patients in control group were not given oral honey. Patients were evaluated post operatively after 1, 2, 7 and 14 days for post operative pain, healing of tonsillar fossa wound, post operative bleed, fever, recovery time, patient satisfaction and other criterias.

Results: The results showed that pain was much lesser in study group. There was better wound healing, shorter recovery time with greater patient satisfaction. There were lesser post operative complications like fever with lesser need for intramuscular analgesics. No specific side effects of honey were noted.

Conclusion: So it can be concluded that honey can be considered as a complementary medicine in post operative tonsillectomy cases.

Keywords: Fever; Honey; Post operative pain; Tonsillectomy; Wound healing

INTRODUCTION

Tonsillectomy is one of the most common ENT surgeries performed worldwide even in adults. Pain and wound infection are the most common complications in tonsillectomy.¹ Pain occurs due to mechanical and thermal injuries to the tonsillar fossa during surgery.² This delays the recovery and hospitalisation due to fever, pain and infection.³ Controlling post operative tonsillectomy pain is a challenging task. Various studies have been done for pain management but not much success achieved.⁴ According to a study antibiotics alone are not effective in reducing pain or need for analgesics nor have a affect on recovery time.⁵ Even the use of analgesics and steroids don't cause significant fast relief.⁶

Honey is a everyday household product which is easily accessible, non expensive and with no specific side effects. Its role in wound healing has been studied for long. Studies have shown honey to heal chronic wounds and ulcers.⁷ Honey has also been found to be effective on various types of bacteria.⁸ Honey is said to have antioxidant, antibacteri-

al and anti-inflammatory activity. In spite of its potential it has remained largely underestimated and unexploited. This study aims to study the effect of honey on post operative pain, wound healing and prevention of infection in post operative tonsillectomy cases.

MATERIALS AND METHODS

This prospective randomized case control study was conducted in Department of ENT of our medical college and hospital from August 2011 to July 2012. 40 patients scheduled for tonsillectomy under general anaesthesia, aged above 18 years were enrolled in this study after obtaining written consent from the patients. The approval of the local ethics committee was taken. Exclusion criteria were patients with allergy to honey, patients with diabetes, those with bleeding disorders, acute infection and those who disliked to take honey. All the patients were operated by the same surgeon and anaesthesia was given by the same anaesthetist performing this study. All the patients selected were of indication for bilateral tonsillectomy.

The patients were randomized alternatively into study and control group. All the patients in both groups underwent tonsillectomy by cold dissection method and haemostasis was done using bipolar cautery. In all the patients endotracheal intubation and anaesthesia methods were same. All the patients were kept nil orally for first 6 hours after surgery during which period they were put on same intra venous antibiotics, analgesics and fluids. After 6 hours after the patient was fully awake and was able to take orally the intra venous medication was stopped. 20 patients taken in study group were then given 5ml of locally or commercially available honey orally every 4 hourly and the patient was asked to swallow slowly over few minutes. Remaining 20 patients in

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control group were not given honey. All the patients in both groups were put on same oral antibiotics, analgesics and povidone iodine hydrogen peroxide gargles. The above treatment was given for 2 weeks post operatively. All the patients were discharged 48 hours after surgery and were asked to come for regular follow up.

The patients were assessed post operatively after 24 hours, 48 hours, 1 week and 2 weeks after surgery. The assessment points were –

1. The patient satisfaction was assessed according to LIKERT SCALE as 1 – completely comfortable, 2 – very comfortable, 3 – slightly comfortable, 4 – uncomfortable and 5 – very uncomfortable at each assessment.
2. The patients were assessed for pain in throat at each assessment.
3. The patients were assessed for fever, bleeding from operated site, burning sensation in throat at each assessment.
4. The tonsillar fossa was examined for degree of epithelialization (wound healing) at each assessment.
5. The patients were assessed for need for intra muscular analgesics during first 48 hours post operatively.
6. The patients in study group were enquired about any systemic side effect or complication on taking honey.

RESULTS

Forty patients who gave consent were enrolled in this study. All the patients underwent tonsillectomy under general anaesthesia. Data was collected on all patients. All the patients

Age Group (years)	Male	Female	Total
18 - 30	10	13	23
31 - 50	6	8	14
51 plus	1	2	3
Total	17	23	40

Table-1: Age and Sex wise distribution

were above the age of 18 years. The majority of patients were in the younger age group (58%). 3 patients were above the age of 50 years. There was a slight female predominance among the patients undergoing tonsillectomy 1:1.35. (Table 1)

Regarding the indication for tonsillectomy, majority of patients had recurrent tonsillitis (85%). The other indication was obstructive sleep apnoea (OSA) seen in 6 patients. (Figure 1)

20 patients taken in study group were given 5ml of locally or commercially available honey orally every 4 hourly and the patient was asked to swallow slowly over few minutes. Remaining 20 patients in control group were not given honey. All the patients in both groups were put on same oral antibiotics, analgesics and povidone iodine hydrogen peroxide gargles. The above treatment was given for 2 weeks post operatively. The patients were assessed post operatively after 24 hours, 48 hours, 1 week and 2 weeks after surgery.

Post operative throat pain was almost same in both groups at the end of 24 hours. It was lesser in study group after 48 hours and after 1 week post operatively. After 48 hours only 2 patients (10%) had severe pain in the study group using honey as compared to 5 patients (25%) in control group. Pain was almost same in both groups at the end of 2 weeks post operatively. (Table 2)

Regarding need for intramuscular analgesics during hospital stay post operatively it was calculated from the time patient started taking orally (6 hours after surgery). It was found the need was almost same between 6 to 24 hours post operatively in both groups. But the need for intramuscular analgesics was much lesser in study group using honey (10%) as compared to control group (30%). (Figure 2)

Wound epithelialization was graded according to classification given by Ozlugedik.⁹ It was found that wound healing was much faster in study group using honey rather than control group. 5 patients (25%) and 15 patients (75%) had complete wound healing at the end of 1 week and 2 weeks respectively

Pain	24 hours post op		48 hours post op		1 week post op		2 weeks post op	
	Study group	Control group	Study group	Control group	Study group	Control group	Study group	Control group
No pain	0	0	0	0	12	9	20	19
Mild pain (occasional)	5	5	8	6	8	8	0	1
Moderate pain (tolerable)	10	9	10	9	0	3	0	0
Severe pain (intolerable)	5	6	2	5	0	0	0	0

Table-2: Post operative throat pain in both groups

Wound epithelialization Staging	24 hours post op		48 hours post op		1 week post op		2 weeks post op	
	Study group	Control group	Study group	Control group	Study group	Control group	Study group	Control group
Stage I (No epithelialization)	16	17	11	15	1	3	0	0
Stage II (<30% epithelialization)	2	2	4	3	4	6	0	0
Stage III (30 – 75% epithelialization)	2	1	4	2	5	6	1	3
Stage IV (>75% epithelialization)	0	0	1	0	5	3	4	5
Stage V (complete epithelialization)	0	0	0	0	5	2	15	12

Table-3: Post operative wound healing in both groups

Complication	Upto 24 hours post op		24 - 48 hours post op	
	Study group	Control group	Study group	Control group
Post op bleed	0	0	0	0
Fever	3	4	0	3

Table-4: Complications due to tonsillectomy

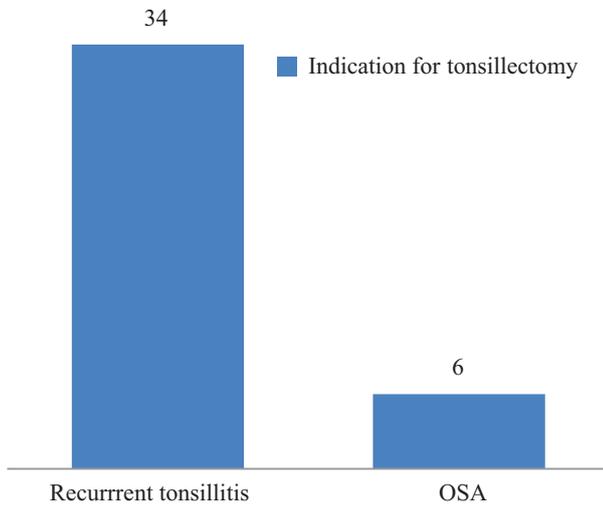


Figure-1: Indication for tonsillectomy

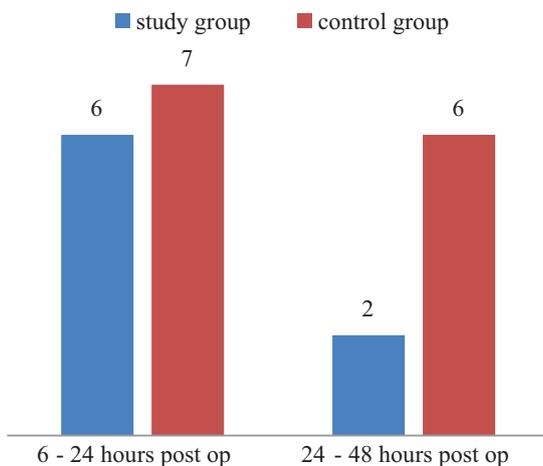


Figure-2: Need for intra muscular (IM) analgesics

in study group as compared to only 2 patients (10%) and 12 patients (60%) in control group respectively. (Table 3) Regarding complications due to tonsillectomy, none of the patients in both groups had any incidence of post operative bleeding. The incidence of fever was much lesser in study group at the end of 48 hours post operatively. (Table 4) Patient satisfaction was higher in study group using honey as compared to control group at the end of 48 hours and 1 week. It was almost same at the end of 2 weeks. Regarding side effects of honey no side effect or allergic reaction to honey was noted in the study group using honey.

DISCUSSION

The efficacy of honey in reducing post operative morbid-

ity after tonsillectomy was investigated in this study. This study aimed to study the role of honey in controlling pain, infection and other complications and fastening the process of wound healing in post operative tonsillectomy cases. The study also aimed to study any side effects of honey if any. We have used commercially or locally available honey for this purpose. Our study included only adult patients to remove any error while noting subjective results like post operative pain and patient satisfaction.

Tonsillectomy is one of the most common ENT surgeries performed worldwide including India since ages. The most common indications of tonsillectomy according to literature available are recurrent tonsillitis, obstructive sleep apnoea, tonsillar abscess and lymphoma.¹⁰ In our study also we found recurrent tonsillitis to be the most common indication followed by obstructive sleep apnoea (Figure 1). Regarding the incidence of tonsillitis according to Thorp et al the incidence is more common in females than in males and in younger age group.¹¹ Similar results were obtained in our study showing female predominance and more incidence in younger age group (Table 1). The most common morbidities after tonsillectomy are bleeding, pain, oedema and poor oral intake.¹² Controlling pain post tonsillectomy is a challenging task. Pain after tonsillectomy is due to inflammation, nerve irritation and pharyngeal spasm.¹³ According to a study no analgesic is enough to provide analgesia after tonsillectomy.¹⁴ Dhiwakar et al in a study showed that antibiotics alone have no role in reducing pain or need for analgesic or any effect on recovery time.⁵

Honey is easily accessible, non expensive and without any specific side effects. It was used to treat infected wounds as long as 2000 years back. Egyptians since ages used honey for corneal and conjunctival inflammations and burns.⁹ The antibacterial property of honey was first recognised by Van ketel in 1895.¹⁵ The anti inflammatory activity of honey has been studied in various clinical trials where it decreased severity of mucositis in post radiotherapy cases,¹⁶ in treatment of gingivitis¹⁷ and in ophthalmological inflammations.¹⁸ Pain post tonsillectomy is due to mechanical and thermal injuries to tonsillar fossa leading to inflammation. Studies have shown that wounds infected with staphylococcus aureus are rendered sterile by honey.¹⁹ Tonsillar fossa heals as open wound post tonsillectomy and it has been proved that honey accelerates wound recovery and decreases post operative pain.²⁰ In a study honey has been found to be inhibitory to both gram positive and gram negative bacteria and to both aerobes and anaerobes including staphylococcus aureus and pseudomonas.²¹ Honey decreases prostaglandin E2 and alpha 2, thromboxane in blood leading to pain relief.⁹ It also contains glucose and hydrogen peroxide and a acidic pH which help in fighting infection and prevent infection.²¹ Similarly in our study we obtained much less post operative pain at the end of 48 hours and 1 week (Table 2) and less need for intramuscular analgesics in patients who were given honey post operatively (Figure 2). Also the incidence

of post operative infection was much lesser in study group using honey (Table 4).

Honey's role in wound debridement has also been studied.²² Honey increases the activity of enzyme plasmin which has a role in tissue repair by inhibiting formation of plasminogen activating factor.²³ It also stimulates the release of cytokines, tumour necrosis factor and interleukins from monocytes which play a role in healing and tissue repair.²⁴ In our study also we obtained faster wound epithelialization in study group using honey (Table 3).

The side effects and allergic reaction to honey are rare.²⁵ It can cause a stinging pain due to acidic pH.²⁵ It was also found in a study that there is no permanent resistance to honey.²⁶ Honey though sometimes contains spores of clostridia which can cause botulism. In our study no side effects of honey in patients were noted in study group.

CONCLUSION

Honey is an ancient remedy which is being rediscovered for post operative management of tonsillectomy cases. Honey with anti inflammatory effect can reduce post operative pain. Oral administration of honey post operatively increases wound healing, decreases infection because of its antimicrobial activity without causing any major side effects leading to greater patient satisfaction. It is also easily accessible and inexpensive.

So we can conclude that honey is effective and can be considered as a complimentary medicine alongside other modern pharmacological drugs with regard to post operative tonsillectomy cases. More research is needed to study and compare the effects of various sub types of honey available and to study the use of honey in other post operative surgeries and in other acute inflammatory diseases of throat.

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A Study on Echocardiographic Evaluation of Pericardial Diseases

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ABSTRACT

Introduction: Pericardial effusion was a diagnostic enigma before the advent of echocardiography, both in developed and developing countries, more so in poorer countries. Advent of M-Mode and 2D-Echocardiography has revolutionized the diagnosis and management of pericardial diseases. The ECG and x-ray chest may be non-diagnostic in early cases. Echocardiography helps to overcome this difficulty. Objective of the present study was to study is taken up to evaluate role of Echocardiography in early detection of pericardial effusion and also to quantitate the pericardial fluid by measuring the amount of fluid drained during surgery.

Material and Methods: The present study was carried out at Osmania General Hospital, Hyderabad. About 15 patients were studied in a tertiary care set up. The age group of the study was in the range of 8-43 years. The selected patients underwent routine blood investigations, x-ray, ECG and Echo M mode and 2 Dimensional (ADL).

Results: There were 11 males and 1 female patients. There were 2 cases of effusive-constrictive pericarditis, 1 case of constrictive pericarditis and the remaining (9) were of pericardial effusion.

Conclusion: Echocardiography was extremely useful not only in demonstrating pericardial effusion but also showed various abnormalities of mitral valve, septal motion and cardiac motion.

Keywords: Pericardial effusion, Pericarditis, ECG, Echocardiography

INTRODUCTION

In healthy states the two serous membranes of the pericardium are closely opposed to each other and contain 10-15 ml of fluid. During infections and inflammation, the amount of fluid increases abnormally. Persistent elevation of systemic venous pressure, Kussmaul sign (inspiratory increase in jugular venous pressure) and its absence in cardiac tamponade has been emphasized by Spodick and others¹ Pulsus Paradoxus is also observed in cardiac tamponade. Pericardial knock may be heard in case of constrictive pericarditis.² Elevated diastolic pressure is observed in both the ventricles.³ Increased venous pressure and decreased arterial pressures are also seen.

Pericardial effusion is not identified in the initial stages but in such cases echocardiography has proved invaluable. In evaluating patients with pericardial effusion,⁴ constrictive pericarditis, effusive constrictive pericarditis and metastatic

depositions causing effusion echocardiography has been very helpful.

The advantage of 2D echocardiography over M-mode echocardiography 1) that it gives clear anatomical definition of pericardial space and permits identification of pericardial effusion. 2) Localized pericardial effusion can be easily seen in 2D echocardiography. 3) Medial and lateral extent of pericardial effusion and apical location of pericardial effusion can be determined by 2D echocardiography.

2D echocardiography can be done in different planes. 1) Parasternal a) Long-axis b) Short-axis view, 2) Apical view shows all four chambers of heart, 3) Subcostal, 4) Suprasternal.

MATERIAL AND METHOD

A hospital based cross sectional study was carried out. Institutional Ethics Committee permission was obtained. Informed consent was taken from each and every case. A sample size of 15 cases was taken in a tertiary care set up. Due to lack of data 3 cases were excluded from the study. The cases were chosen irrespective of their duration of disease. The following investigations were done for all the cases.

1. ESR
2. Hemogram
3. CUE
4. Blood sugar and urea
5. Chest X ray PA view
6. ECG
7. Echo M mode and 2 Dimensional (It was done on Advanced Technology Lab [ADL])

RESULTS

Table 1 shows anterior and posterior echo free space was absent in the case of constrictive pericarditis. A posterior echo free space ranging from 1-4 cm was present in all cases and an anterior echo free space was present in all, but three cases

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of pericardial effusion. A larger echo free space was associated with large pericardial effusion.

With 2D Echo, echo free space was observed anteriorly, posteriorly, apically, medially and laterally depending on the amount of fluid. Pericardial effusion was observed in all the cases. A small echo free space is also observed in effusive constrictive pericarditis cases which was constant both in systole and diastolic phases. The cases which were identified with 2D Echo as large pericardial effusion were confirmed at surgery. The amount of fluid ranged from 400 ml to 1000ml. Table 3 shows flat motion of posterior left ventricular wall was associated with constriction. Abnormal anterior motion during diastole in two cases was associated with large effusions.

DISCUSSION

In the study group, 12 cases were taken. Only one (8.3%) was female amongst the 12 cases. The age of the study subjects varied from 8 to 43 years. Ten patients (83.3%) cases had raised ESR and leukocytosis. Eleven patients (91.7%) were found to have cardiomegaly on x-ray chest PA view. In two thirds (66.67%) of the cases, ECG changes were not seen. In the rest (33.3%) of the cases, low voltage complexes and non specific ST-T changes were observed.

In M-Mode echocardiography⁵ anterior echo free space was observed in 25% of cases and in another 25% of the cases this was not properly visualized. Half (50%) of the cases had 1-5 cm echo free space posteriorly. In constrictive pericarditis, echo free space was not observed. With 2D Echo, echo free space was observed anteriorly, posteriorly, apically, medially and laterally depending on the amount of fluid.

Paradoxical movement of septum was observed in both systole and diastole in 5/12 cases. Left ventricular posterior wall abnormality was observed in 2/12 cases and in one case flat motion was observed. Flat motion was observed in constrictive pericarditis cases. In anterior wall motion abnormality large amount of fluid was seen.⁶

Inability to diagnose pericardial effusion with only clinical findings, X-ray chest and ECG in early stages, may lead to development of cardiac tamponade. With the advent of Echocardiography the diagnosis of pericardial effusion in early stages is possible.⁷ There are definitive signs of cardiac tamponade by echocardiography, like right ventricular compression and swinging movements of heart.⁸

It is possible to do pericardiocentesis with the help of Echocardiography.⁹ The quantity of fluid can be estimated with the help of Echocardiography. In mild effusion fluid accumulation is seen only posteriorly. In moderate effusion the accumulation of fluid is limited to posterior, anterior and lateral areas.¹⁰ In large effusion there is accumulation of fluid anteriorly, posteriorly and apically.¹⁰

Right ventricular compression by pericardial effusion was shown to be reliable sign of cardiac tamponade.¹¹ M mode Echo is much less sensitive compared to 2D Echo. Twelve

Case No	ECHO Free space -anterior	ECHO free space-posterior
1	1 cm	1.5 cm
2	Not visualized	2 cm
3	2.5 cm	2 cm
4	5cm	2 cm
5	Absent	Absent
6	Not visualized	4 cm
7	1cm	3cm
8	Present	1.5cm
9	Not visualized	1.5cm
10	5cm	2cm
11	Present	1.5cm
12	Present	1 cm

Table-1: Distribution of pericardial fluid in M-Mode echocardiography

Case No	Echocardiographic quantification	At surgery
2	Large	400ml
3	Large	500ml
4	Large	3000ml
6	Large	500ml
8	Large	1000ml
10	Large	1000ml

Table-2: Shows large effusions have 400 ml or more of pericardial fluid.

Case No	LVPW Abnormality
1	Nil
2	Nil
3	Nil
4	Nil
5	Not clearly visualized
6	Flat motion
7	Abnormal anterior motion during diastole
8	Abnormal anterior motion during diastole
9	Nil
10	Nil
11	Nil
12	Flat motion

Table-3: Left ventricular posterior wall (LVPW) abnormality

cases with pericardial disease whose age ranged from 8 to 43 years were studied. There were 11 males and 1 female patient. There were 2 cases of effusive –constrictive pericarditis, 1 case of constrictive pericarditis and the remaining were of pericardial effusion. The diagnosis was confirmed in 6 of the cases at surgery. Remaining patients showed good response to medical treatment.

Two of the cases had pyogenic pericardial effusion. Both were children, one of whom had Bronchopneumonia. One patient had thymoma invading pericardium and producing hemorrhagic effusion.

Most of the patients showed raised ESR. One patient showed leucocytosis who had pyogenic effusion. All the patients had increase in size of cardiac silhouette on chest X-ray (except one case of constrictive pericarditis). Four of the cases were

associated with pleural effusion. Low complexes were present in ECG of four patients and all these patients had large pericardial effusion.

Echocardiography was extremely useful not only in demonstrating pericardial effusion but also showed various abnormalities of mitral valve, septal motion¹² and cardiac motion. Swinging motion of heart¹³ was diagnostic of cardiac tamponade. Highly specific signs of constrictive pericarditis such as diastolic paradoxical movement of septum were noted which were useful in detecting an element of constriction in effusive-constrictive pericarditis.

CONCLUSION

Echocardiography is a well accepted diagnostic tool in the evaluation of patients with suspected cardiovascular disease. It is totally non-invasive, can be used at the bedside for serial evaluation and supplies anatomic and functional information not available by any other technique, and has led to its rapid acceptance over the past decade.

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Pancreatitis in Children: Experience at a Tertiary Care Centre

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ABSTRACT

Introduction: The data concerning pancreatitis in children is not very voluminous. The present study highlights the demographic profile, clinical presentations, etiologies and laboratory findings in pediatric pancreatitis at a teaching hospital in Bareilly.

Material and Method: We retrospectively reviewed 19 cases of pancreatitis in children admitted from July 2011 to July 2015 at our institution.

Results: Total of 19 patients were diagnosed to have pancreatitis. Systemic infection was most common cause of pancreatitis 3/19 (15.78 %) followed by trauma and drugs. Acute abdomen was most common presentation. Serum amylase and lipase was raised in 17/19 (89.4%) and 11/15 (73.3%) patients respectively. USG abdomen and CTscan abdomen have good diagnostic sensitivity and specificity.

Conclusion: Pancreatitis in children is not so uncommon. Etiology could be established in only 58% of children. Systemic complications and pseudocyst are common complications. Patients presenting with acute abdomen should be screened for pancreatitis as well.

Keywords: Pancreatitis, trauma and drugs, Systemic complications and pseudocyst

INTRODUCTION

Though there is a wealth of literature around pancreatitis in adults, but there is a paucity of data regarding pancreatitis in children. From our country mainly case reports and few original articles of pancreatic diseases are available.¹⁻⁵ For adults, alcoholism and cholelithiasis are the most common causes of acute pancreatitis. In western data acute pancreatitis in children occurred mostly due to infections, trauma, pancreaticobiliary tree anomalies, drug abuse, or systemic diseases.⁶ The present study endeavors to highlight the demographic profile, clinical presentations, etiologies and laboratory findings in pediatric pancreatitis at a teaching hospital in Bareilly. We retrospectively reviewed 19 cases of pancreatitis in children occurring from July 2011 to July 2015 at our institution. Special emphasis was laid on highlighting the underlying causes, presenting features, clinical complications, and outcomes of these patients.

MATERIAL AND METHODS

Retrospective data was collected from medical records for all children admitted to department of Pediatrics who were

diagnosed having pancreatitis between the years 2011-2015. Consent was not obtained as it was a retrospective study and ethical clearance was obtained from the institute ethics committee.

The diagnosis of acute pancreatitis is typically based on results of physical examinations, laboratory testing, and imaging studies. Criteria for the diagnosis of pancreatitis in this study were: Children who presented with abdominal pain with or without fever, features suggestive of acute abdomen and laboratory confirmation with one or more of the following: raised serum amylase >200 U/L, elevated serum lipase level (> 165U/L) in the absence of other possible contributing factors or evidence of pancreatic inflammation from ultrasonography (USG) or computed tomographic (CT) imaging.

In this study, USG evidence of pancreatic inflammation included blurred outline, enlargement and heterogenous echogenicity of the pancreas. The typical features of pancreatitis found on CT scan included diffuse enlargement of pancreas, hemorrhagic necrosis and pseudocyst.^{7,8}

Patients were managed conservatively. Those patients who required surgical intervention were not included in study. Conservative management included bowel rest, nasogastric decompression, and intravenous fluid administration. Morbidity included pseudocyst formation or relapse. Relapse was defined when the symptoms recurred after discharge and the diagnostic criteria were fulfilled again.

STATISTICAL ANALYSIS

Descriptive statistics were computed for baseline demographic, clinical and laboratory features and frequency tables were generated.

RESULTS

During the study period 19 cases of pancreatitis were admitted.

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ted and included in study. Demographic clinical profiles and investigation of these cases have been shown in table 1.

A higher incidence was observed in males 12/19 (63.15%) as compared to females. Patients between ages of 3-16 yrs were mainly affected, median age being 9.94 yrs.

Most common presenting complaint was abdominal pain present in all patients followed by nausea and vomiting 18/19 (94.7%). Vague abdominal distension and lump was found in 6/19 (31.5%). Laboratory evidence of pancreatitis in the form of raised serum amylase was found in 17/19 (89.4%), where as raised serum lipase was found in 11/15 (73.3%). USG evidence of pancreatitis was found in 12/19 (63.15%) patients. CT scan was done in 2 patients, both of them had finding suggestive of pancreatitis.

All patients met the criteria of pancreatitis. Common etiology of patients with pancreatitis is given in Table 2. Out of 19 patients 3 (15.78%) had associated systemic infection. One patient had mump, one patient had septicemia with basal pneumonitis with mild ascites on ultrasonography and one patient had associated septicemia with peritonitis and acute respiratory distress which later on expired during treatment course. Blunt abdominal trauma was found in 2/19 (10.5%) patients. None of patients with trauma required surgical intervention. Two patients had history of drug intake (one patient was taking prednisolone and other one taking sodium valproate for seizure disorder). Two out of nineteen patients had associated cholecystitis/cholelithiasis and pancreatic lithiasis. Tuberculosis was incidentally diagnosed in 2/19 patients which however did not appear to have any direct correlation.

All patients were managed conservatively, 18/19 patients improved by conservative management. One patient developed pancreatic abscess which required percutaneous drainage and later on improved with medical management. One patient developed pseudocyst. One patient expired within 48 hrs of admission; he had severe sepsis with ARDS with peritonitis (Table 3).

One patient after discharge came with recurrence of symptoms and CT scan was done, suggestive of pancreatic lithiasis and cholelithiasis.

Further metabolic and genetic work up could not be done and CT scan was also done in only 2 patients due to financial constraints.

DISCUSSION

The demographic profile of pancreatitis in children in our study was similar to that reported by Das *et al* 2004. There was a higher incidence in males 63.15% (12/19) compared to females. Most of children were of older age group, with mean age being 9.94 yrs in range (3-16 yrs). This corroborates with other studies in which mean age was 7.4 -10.2.¹⁰⁻¹²

Epigastric abdominal pain was universally present in our study. Similar finding have been reported in other studies as well.⁹⁻¹² Nausea, vomiting, guarding and rigidity were found

	(n)	%	
Sex (males)	12	63.15	
Mean age at onset (3years -16years)	9.94		
Median duration of illness	16 days	(01day-60 days)	
Abdominal Pain	19	100%	
Nausea/vomiting	18	94.7%	
Distension /Lump	6	31.5	
Fever	14	73.6	
Hepatomegaly	10	52.6	
Failure to thrive	8	42.1	
Ascites	2	10.5	
S. Amylase	N	n	%
<200 (IU)	19	2	10.5
200-800 (IU)	19	15	78.9
>800 (IU)	19	2	10.5
S. Lipase (>165)			
<165	15	4	26.67
>165	15	11	73.3
CRP +ve	19	5	26.3
Positive USG Finding	19	12	63.1
CT abdomen positive	2	2	100

Table-1: Demographic profile, clinical and laboratory parameters of Pancreatic Disease

	n (N = 19)	%
Systemic infection	3	15.78
Drugs	2	10.5
Trauma	2	10.5
Cholecystitis and Cholelithiasis / Pancreatic lithiasis	2	10.5
TB	2	10.5
Unknown	8	42.1

Table-2: Etiology of Pancreatitis in children

Pulmonary	19	2	10.5
Ascites	19	2	10.5
Peritonitis	19	2	10.5
Pseudocyst	19	1	5.2
Pancreatic abscess	19	1	5.2
Mortality	19	1	5.2
Recurrence	19	1	5.2

Table-3: Complications

in 94.7% patients and fever in 73.6 %.

Weizman and Durie¹³ considered serum amylase to be the most important diagnostic aid in determining pancreatic injuries. Although serum amylase can be normal in pancreatitis¹⁴, extreme is associated with serious complications of pancreatitis or other illnesses.¹⁵ In Our study 17/19 (89.4%) patients had elevated serum amylase (>200 IU/L). Extreme elevation of serum amylase (>800IU/L) was found to be associated with pancreatic abscess and hemorrhagic ascites. Raised serum lipase was found in 11/15 (73.3%). This was comparable to findings from other studies, with sensitivity and specificity ranging from 86.5% to 100%.^{16,17}

Abdominal USG has been shown to have 80% accuracy in the evaluation of pancreatitis, usually showing decreased echogenicity of the pancreas.¹⁸ It is a noninvasive imaging modality that allows not only for diagnosis of the disease but also for following its course and for detecting complications.¹⁴ USG abdomen was performed in all cases, being relatively inexpensive and noninvasive and we had 12/19(63.15%) patients who had findings suggestive of pancreatitis. As to contrast-enhanced CT, Clavien and Hauser (1998) reported a sensitivity and specificity of 92% and 100%, respectively.¹⁸ In our study we were able to perform CT scan in only 2/19 cases and both had findings suggestive of pancreatitis, though USG findings were normal in these patients.

Spectrum of presentation of pancreatic diseases in children differs from that in adults. Alcohol and gallstones account for more than 60% of cases of acute pancreatitis in adults^{5,6}, but they are rarely a causative agent in children. Etiological profile of children with pancreatic disorder in our study was different from that van *et al*¹⁹ and children hospital, Boston.²⁰ They have reported tumor, trauma, congenital malformations and necrotic disorders as etiology of pancreatic disorder. At our institute we have not been able to investigate extensively which might have reduced patients with unknown etiology. The most common complication of childhood pancreatitis pseudocyst formation (10–25%).¹³ Where as in our case systemic complications (acute respiratory distress, ascites and peritonitis) were most common followed by pseudocyst formation (5.2%) and pancreatic abscess (5.2%).

There is no disease-specific treatment for pancreatitis.¹⁰ Supportive therapy remains the basis of management. All patients were managed conservatively and 18/19 improved on supportive treatment.

Mortality rate in our study was 5.2% (1/19) compared to 3.6% reported by Das *et al*. Variable rates have been reported ranging from 0-26 % by previous studies.^{1-4,10,11}

CONCLUSION

Pancreatitis in children is not so uncommon. Etiology could be established in 58% of children. Patients presenting with acute abdomen should be screened for pancreatitis as well. Early suspicion, diagnosis and proper management are keys to reduce potential complications and mortality.

LIMITATIONS

Because of financial constraints and unavailability of metabolic workup incidence of patients with idiopathic pancreatitis may have been reduced.

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Epidemiological Profile of Head and Neck Cancer Patients in Western Uttar Pradesh and Analysis of Distributions of Risk Factors in Relation To Site of Tumor.

Mohammad Shadab Alam¹, Roshan Perween², Shahid A Siddiqui³

ABSTRACT

Introduction: Head and neck cancers (HNC) are major form of cancers in India. The spectrum varies from place to place within the country because of significant diversified risk factors. Aims and Objective of the study were to study, epidemiology and risk factors of HNC patients from western UP and to find out correlation between risk factors and different anatomical regions involved.

Materials and method: All patients with histologically confirmed diagnoses of HNC between JAN 2011 to DEC 2013 were selected from hospital records. Data regarding age, gender, addiction habits, site of tumor and other details were obtained from their clinical records and statistical analysis was done.

Result: HNC, accounts for 21.2% of total body malignancy and 47 % of all malignancies in males and 2.5% in females. Squamous cell carcinoma was the most common histological type (97%). Maximum incidence of HNC (>60%) was in 40-60 year of age. Male: female ratio was (16:1). Oral cancers were most common HNC in patients below 40 year age group while carcinoma oropharynx and larynx were more common in patients above 40 year age group.

Conclusion: Tobacco smoking was most prevalent risk factor for carcinoma oropharynx, larynx and hypopharynx. Alcohol drinking alone was observed in <1% patients as a risk factor. In oral tongue cancer smoking and tobacco chewing were equally prevalent. Habit of tobacco chewing and alcohol were significantly higher in carcinoma buccal mucosa than other HNC suggesting synergistic effect specific to this site.

Keywords: Head and Neck cancer, Epidemiology, Risk factor, Tobacco use, Prevalence, Synergistic effect, Uttar Pradesh.

It is necessary to identify the differences if any in the sites, patterns, and incidences of the disease amongst various communities living in a geographic areas having varying pattern of climate and physical environments to identifying dietary habits, social customs, and such other factors. This study has been done in an attempt to define the demographic and risk profile of HNC patients in western Uttar Pradesh.

MATERIALS AND METHOD

This cross sectional study has been designed and approved by institute's ethical committee.

Patient population- Catchment area of this study was major population of western Uttar Pradesh. Study population consist of 850 patients registered and finally diagnosed with head and neck malignancy in our institute between Jan 2011 to Dec 2013. Data pertaining to these patients was entered in standardized questionnaire. These were in context to age, sex, site involved, smoking, alcohol and chewing habits and other clinical details. Patients on basis of histopathology were categorized into squamous cell carcinoma and other malignancy. Various malignancies of the head-neck region were classified according to International Classification of disease coding system devised by WHO (10th revision) using ICD codes from C00 to C80.

STATISTICAL ANALYSIS

Statistical analysis was done on the data collected and result was formulated. Significance (*P*) values and Correlation values were determined by Pearson Chi-square test by correlat-

INTRODUCTION

Head and neck cancers (HNC) are major form of cancers in India, accounting for 23% of all cancers in males and 6% in females.¹ In India, the disproportionately higher incidence of HNC compared to other common malignancies may be due to excessive consumption of tobacco in various forms with and without alcohol, low socioeconomic status leading to poor oral and dental hygiene, poor diet and infections of viral origin.² The spectrum of HNC varies from place to place within the country because of significant variation in regional risk factors.^{3,4,5}

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ing two variables at a time from age, gender, risk factor, site of tumor. P Value <0.05 was considered significant and value >0.05 was considered statistically insignificant.

RESULTS

Study population consists of 794 males and 56 female patients of head and neck cancer. Male, female ratio was 16:1. More than 97% cases were squamous cell carcinoma. Difference in incidence in males and females was significant in each age group (P value<.05).Maximum incidence of HNC was found in 51-60year age group (34%) but in male incidence was almost equal in 51-60 and 41-50 age group (n=246 and 241 respectively). More than 60 percent of the patients were 41-60 year of age (Table 1).

Distribution of cases according to age, gender and site of the tumor

Most common site of HNC was oral cavity (n=279) followed by oropharynx (n=271) and larynx (n=179). Malignancy arising from hypopharynx (n=36), nose and paranasal sinuses (n=19) and nasopharynx (n=8) were uncommon. Second-

ary neck with unknown primary constituted 5% of all HNC. Tumors arising from salivary glands (n=8), thyroid (n=4), external auditory canal (n=1), ear pinna (n=1) and eye lid (n=2) all together account for <2% of HNC. Most common sub site of HNC was base of tongue (16%) followed by buccal mucosa (14.2%). Oral tongue (13.5%) and supraglottic larynx (13.5%) had equal incidence (Table-2).

Oral cancer was most common HNC in less than 40 year age groups and ranked second and third respectively in 41-50 and above 50 age groups. Oropharynx was most common HNC in more than 40 year age groups. Carcinoma larynx has shown consistent increase in incidence with increase in age, and ranked second common HNC in more than 50 year age groups. Secondary neck with unknown primary presents 5-8% of HNC in all age groups. Cancer arising from salivary glands, nose and paranasal sinuses (PNS) were more common in <50 year age group (Table-3).

Distribution of risk factor according gender and age

In this study tobacco smoking was found to be most prevalent risk factor in total (35.8%) as well as in male patients (37.3%). Tobacco chewing only was uncommon (8.7%) in

Age group (Years)	Total		Gender				P Value
	N	%	Females		Males		
			N	(%)	N	(%)	
<30	45	5.3	1	(1.78)	44	(5.54)	<.0001
31-40	133	15.6	7	(12.5)	126	(15.86)	
41-50	241	28.3	15	(26.8)	226	(28.46)	
51-60	246	28.9	19	(33.92)	227	(28.58)	
60-70	137	16.1	11	(19.64)	126	(15.86)	
71-80	42	4.9	2	(3.57)	40	(5.03)	
>80	6	0.7	1	(1.78)	5	(0.63)	
Total	850		56		794		

Table-1: Distribution of Case Based on Age Group and Gender (Total=850)

S. No	Site	N	(%)	N	(%)
1	Oral cavity			279	(32.82)
	Oral tongue	115	(13.5)		
	Buccal mucosa	121	(14.2)		
2	Oropharynx			271	(31.88)
	Base of tongue	135	(15.88)		
	Tonsillar fosse	77	(9.05)		
3	Larynx			179	(21.05)
	Supraglottic	115	(13.5)		
4	Hypopharynx			36	(4.23)
5	Nose and Para nasal sinuses			19	(2.23)
6	Nasopharynx			6	(0.70)
7	Unknown primary			44	(5.17)
8	Others			16	(1.88)
	Salivary gland	8	(0.94)		
	thyroid	4	(.47)		
	Carcinoma ear pinna and external auditory canal	2	(.23)		
	Sebaceous gland carcinoma of eye lid	1	(.12)		
	Basal cell carcinoma lower eye lid	1	(.12)		

Table-2: Distribution of Case Based on Site of Disease (Total=850)

males but in combination with smoking it accounts second common risk factor (19%). In female patients, most prevalent risk factor was tobacco chewing (34%) followed by smoking (16%) and smoking with tobacco chewing (14.2%). Alcohol addiction was rare (<5%) in females while in males, it was found either with smoking (10%) or with smoking and chewing tobacco (9.3%). Only 30% female and 14% male were free of all these risk factors. In <30 year age group tobacco chewing (26.7%) was most common risk factor, smoking (13.3%), smoking with tobacco chewing (15.5) and smoking with chewing and alcohol consumption (13.3%) had equal prevalence. Above this age group, smoking alone was most prevalent risk factor and found in 34-50 % of each age group. Smoking with tobacco chewing and alcohol was much common in below 50 year age groups. Smoking with alcohol habit was present in 10% of patients in each age group. Thirty three percent of more than 80 year age patients were free of all these risk factors compared to less than 20% patients in other age groups.

Distribution of risk factor according to site of tumor

In patients of carcinoma oropharynx, larynx and hypopharynx and secondary neck with unknown primary, smoking alone was present in 47%, 43%, 52% and 52% population respectively and smoking with other habits was found in 60% population as the most common risk factor. Tobacco chewing alone was rare (<5%) in this group. In patients of oral

cancer, tobacco chewing, smoking, tobacco chewing with smoking and tobacco chewing with smoking and alcohol was present in 25%, 20% 19% and 12.5% population respectively. Smoking with alcohol was present in 17% cases of carcinoma nasopharynx and larynx. In cancer arising from nose and para nasal sinuses (PNS), thyroid and salivary gland, about 50% patients and in carcinoma nasopharynx 35% patients had none of these risk factors. In remaining sites only 16% of patients were free of all these risk factors.

In patients of carcinoma oral tongue and buccal mucosa, tobacco chewing was present in 22% and 24% population respectively. Smoking alone was more prevalent in oral tongue (28% vs 8%) and tobacco chewing with smoking (14% vs 21%) or with smoking and alcohol (16% vs 33%) was more prevalent in buccal mucosa. In patients of carcinoma base of tongue (BOT) and tonsillar fossa smoking, tobacco chewing, tobacco chewing with smoking was present in 48%, 3.5% and 16% population respectively. Combined habit of smoking, alcohol and tobacco chewing was found to be more common in carcinoma BOT (16% vs 5%). Only 14 % cases of carcinoma BOT and 4% cases of carcinoma tonsil were free of all these risk factors (Table-4).

DISCUSSION

Present study is retrospective and hospital based, which includes histologically confirmed cases of head and neck

Age Group (year)	Oral cavity N	Oropharynx N	Larynx N	Unknown Primary N	Hypopharynx N	Nose and-PNS N	Nasopharynx N	Other N	P Value
<30	35	0	0	1	1	3	0	5	<.001
31-40	79	32	16	2	1	0	1	2	
41-50	74	82	50	12	7	8	5	3	
51-60	51	95	59	20	16	5	0	1	
60-70	31	45	39	7	8	3	0	3	
71-80	9	15	13	2	3	0	0	2	
>80	1	2	2	0	0	0	0	0	
Total	279	271	179	44	36	19	6	16	

Table-3: Distribution of case according to age group and site of Tumor (Total=850)

Habit	Buccal Mucosa (N=121)		Oral Tongue (N=115)		Base Of Tongue (N=135)		Tonsillar Fosse (N=77)		Larynx (N=179)		P Value
	N	%	N	%	N	%	N	%	N	%	
Smoking	10	8.2	32	27.8	65	48	38	49.3	77	43	<.0001
Chewing	29	24	25	21.7	4	3	3	3.9	3	1.7	
Smoking+ Chewing	25	20.7	16	13.9	21	15.5	14	18	36	20	
Smoking+ Alcohol	1	0.8	4	3.5	18	13.3	7	9	30	16.7	
Smoking+ Chewing+ Alcohol	40	33	18	15.6	7	5	12	15.6	9	5	
Chewing+ Alcohol	4	3	3	2.6	1	0.7	0	0	1	0.5	
Na	12	10	17	14.8	19	14	3	3.9	23	12.8	
Total	121		115		135		77		179		

Table-4: Distribution of Common Risk Factor in Common Sites of Head And Neck Cancer

cancers(HNC). Study population is mixture of rural, urban and suburban population. Half of the study population is non vegetarian. As per various studies published squamous cell carcinoma varying from 88-96%.⁴⁻⁷ is the most common histological sub type. In our study squamous cell carcinoma was observed in more than 97% Cases.

Prevalence of HNC with respect to total body malignancies (TBM) varies from 9.8% to 42.7%.^{8, 9,10,11} and it accounts for 30% of all cancer in males and 11-16 % in females. Male, female ratio is commonly 1:1 to 3.1:1.^{4,6,12} In the current study 4015 cases of confirmed malignancy (1698 male and 2317 female) were registered between Jan 2011 to Dec 2013. Out of that 850 (794 males and 56 females) were of head and neck cancers (HNC) which represents 21.2% of all cases and 47 % of males and 2.5% in female cancer. Male, female ratio was 16:1. According to one of the study in eastern UP, HNC burden was reported to be 35.65% in male and 7.44% in female.¹³ From this study we can conclude that state of Uttar Pradesh has very high burden of HNC only second to the highest (54.48%) reported in northeast⁴ in males and very low burden in females in this region.

Geographical variations in incidence of HNC in different part of world and within the country is indicative of differences in the prevalence of regional risk factors. This variation in different regions of India is supported by various studies.^{4-9,12} According to recent studies in different region of India on HNC patients, larynx was most common site of HNC in South India,¹⁴ (38.37%) and Bihar,⁷ oral cavity in U.P.⁵ and Ahamadnagar(41.28%)⁶ and oropharynx in Northeast⁴ and Meghalaya(24%).¹⁵ In this study oral cancer (32.8%) were found to be most common HNC and base of tongue was most common sub site followed by buccal mucosa. Carcinoma hypopharynx (<5%) was uncommon in this population.¹⁵

In India, tobacco consumption is responsible for half of all the cancers in men and a quarter of all cancers in women.¹⁶ Variations in the incidence of HNC by site is mostly related to the relative distribution of major risk factors such as tobacco or betel quid chewing, cigarette or bidi smoking, alcohol consumption and viral infections.

India has one of the highest rates of oral cancer in the world, partly attributed to high prevalence of tobacco chewing.^{2,17,18,19} The prevalence of both smoking and chewing tobacco in various forms varies significantly among different states in India. Some regional patterns have been observed for chewing tobacco. Chewing of tobacco is relatively more common in the Central, Eastern, Western (except Goa) and Northeastern states (except Meghalaya) compared to Northern and Southern states. However, in the Northern states, where chewing is relatively less common, smoking of tobacco is relatively higher (except in Punjab where tobacco prevalence is one of the lowest as majority of its population (58%) practice Sikh religion, which prohibits tobacco consumption). Tobacco consumption is highest in the least educated, poorest, and scheduled castes and scheduled tribe.²⁰ Prevalence of tobacco consumption increases up to the age

of 50 year and then there is decline in Indian population.²⁰ In this study maximum number of head and neck cancers are present in 50-60 year of age and > 60% of HNC were found in 40-60 year of age. Prevalence was equal in 41-50 year and 51-60 year age group in males.

Smoking is relatively more pronounced factor for cancer of pharynx (RR=8.5) and larynx (RR=7.5) than cancer of oral cavity (RR=4.9).²¹ In this study smoking was present in >80% cases of cancer of oropharynx, larynx and hypopharynx and only 50% cases of oral cancer. There is six fold higher risk of oral cancer among the people having habit of betel nut and tobacco (gutkha).²² In this study Tobacco chewing including betel nut was present in >60% cases of oral cancer and only 30% of pharynx and larynx cancer. This habit was found to be more common in younger age group and female patients that may be the reason for oral cancer as most common cancer in this group.

In this study out of 850, only one case of HNC with alcohol only as a risk factor was found. Although relative risk of modest amount of alcohol consumption on different site of HNC in non smoker is controversial. This study supports the result that there is little or no risk of HNC with moderate alcohol intake in ex-smokers or who never smoked.^{21,23}

High alcohol consumption has RR>5 mainly for oral cavity, oropharynx and esophagus. When tobacco smoking and alcohol consumption are combined, they may increase the risk by more than 15-fold.²⁴ This effect is possibly because; alcohol may act as a solvent and enhance the penetration of carcinogens into target tissues. Acetaldehyde, which is the alcohol metabolite, has been identified recently as a tumor promoter.²⁵⁻²⁷ In this study combined habit of tobacco chewing and alcohol consumption was most prevalent predisposing factor for oral cancer.

Comparing risk factors of cases of carcinoma oral tongue and buccal mucosa, there was significant difference (p value < .001). Tobacco chewing was equally prevalent in both (22% vs. 24%). Smoking was more prevalent in oral tongue (28% vs. 8%) but tobacco chewing and smoking or Tobacco chewing along with smoking and alcohol is more prevalent in buccal mucosa which suggests synergistic effect of tobacco and alcohol on buccal mucosa but no similar effect on oral tongue (Odd Ratio=2).

In this study, secondary neck with unknown primary constituted 5% of all HNC. Habit of smoking or smoking with alcohol was present in 60% cases. Primary can be detected in more than 50% of these patients after pan endoscopy guided biopsy and PET scan. Primary commonly lies in nasopharynx, oropharynx or, pyriform fosse. These sites have strong association with smoking which could explain habit of smoking in more than half of these patients. In carcinoma nasopharynx, habit of smoking and smoking with alcohol was present in around 70% cases shows strong association between them.

In study population HNC prevalence was very low in females and male female ratio was exceptionally high. Detailed study

on this population can find associated factor responsible for this difference which could be used for prevention of head and neck cancer in other population.

CONCLUSION

Head and neck cancers are one of the most common malignancies prevalent in India with wide variations in risk factors, sites of involvement, geographical and demographic characteristics. Heterogeneity in risk factors and differences in prevalence of HNC at different sites of head and neck region may be because of differences in surface area, micro-anatomy, tissue microenvironment and duration of exposure to carcinogens which need to be explored.

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Retrospective Study Comparing Primary Debulking Surgery (PDS) with Adjuvant Chemotherapy vs. Neoadjuvant Chemotherapy (NACT) Followed by Interval Debulking Surgery (IDS) with Adjuvant Chemotherapy in Advanced Carcinoma Ovary

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ABSTRACT

Introduction: Ovarian carcinoma is the major cause of mortality among women with gynecological problems as its reported very late. We have evaluated and compared two modalities of treatment for advanced (stage III and selected stage IV) ovarian cancer, done at our hospital from January 2003 to June 2010 and also analyzed patient, tumour, and treatment related variables.

Materials and Methods: Records of 72 patients of advanced epithelial ovarian cancer were reviewed. Arm1 included 32 patients who underwent primary debulking surgery (PDS)->adjuvant chemotherapy (6cycles). Arm 2 included 40patients who were given neoadjuvant chemotherapy (NACT) (average2-4cycles)->response assessed->interval debulking surgery(IDS) in responders-> adjuvant chemotherapy(rest2-4cycles). Chemotherapy (both NACT and Adj.CT) given was Cisplatin (intravenous)-75mg/m²+Paclitaxel(intravenous)-175mg/m² over 3hrs with adequate hydration and premedication. Repeated every 3 weeks.

Results: There were relatively elderly patients with higher stage and grade of disease in arm 2. In this arm, 75% patients responded and 25%didn't respond to NACT. Optimal cytoreduction was possible significantly more in Arm2 (83.3%) patients compared to Arm1 (53.1%) patients and also with comparatively less perioperative morbidity and mortality. With median follow-up of 39 months, median disease-free, progression-free and overall survival were same with more systemic recurrences in arm1.

Conclusion: In this study, we found that in ovarian cancer, NACT has good response rate. It significantly increases optimum cytoreductive surgery rate, that too with less aggressive approach, morbidity and mortality. Although, there was no significant gain in survival, but an alternative approach of NACT->Surgery->Adj.CT, which gives equivalent survival to conventional approach of primary debulking surgery, can be considered equal or, even better especially in poor prognostic patients.

Keywords: Carcinoma ovary, primary debulking surgery, neoadjuvant chemotherapy, interval debulking surgery, optimum cytoreduction.

cer related deaths. Unfortunately, 60-70% patients present in advance stage. In stage III and selected stage IV disease, optimal cytoreduction by primary debulking surgery (PDS) followed by platinum and taxol based adjuvant chemotherapy has been standard of care.^{1,2} Due to advanced stage, optimum primary debulking surgery is possible in 30-60% patients only. Various trials have shown that even in advanced stage, ovarian tumour is sensitive to chemotherapy and gives overall response rate of about 70-80%, including complete response of 20-30%. Studies done in this setting of, neoadjuvant chemotherapy followed by secondary cytoreductive surgery, have shown mixed results.³⁻¹⁰ We have evaluated and compared the outcome of two modalities of treatment for advance stage (stage III and selected stage IV) ovarian cancer, at our hospital from January 2003 to June 2010. In this study, we have analyzed in terms of response to neoadjuvant chemotherapy, optimal cytoreductive surgery rate, rate of non standard surgery, treatment related morbidities and mortalities, hospital and intensive care unit (ICU) stay, disease free survival and overall survival. We also analyzed certain patient and tumour related variables.

MATERIALS AND METHODS

The analysis includes total 72 patients of advanced stage (stage III and selected stage IV) epithelial ovarian cancers, treated in our hospital from January 2003 to June 2010.

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INTRODUCTION

Ovarian cancer is the leading cause of gynaecological can-

On the basis of treatment modality used, patients were grouped in 2 arms -

Arm 1 included 32 patients in whom primary debulking surgery (PDS) followed by adjuvant chemotherapy (6 cycles) was done.

Arm 2 included 40 patients, treated with neoadjuvant chemotherapy (NACT) (average 2-4 cycles) followed by interval debulking surgery (IDS) done in chemo-responding patients and then adjuvant chemotherapy (rest 2-4 cycles).

The initial work-up of all patients included clinical examination, radiological studies, serum tumour marker (CA-125) level and histo/cytological evidence of malignancy by FNAC or, biopsy. In all patients, surgical exploration was done, to assess resectability of tumour. Primary debulking surgery was performed when optimal cytoreduction seemed feasible and neoadjuvant chemotherapy was given for primary unresectable tumours. Surgical exploration was usually done laparoscopically (44 cases). Laparotomy was done (28 cases) when laparoscopy was contraindicated. Regarding treatment modality to be used, it was based on combined decision of operating surgeon and oncologist. Primary debulking surgery was performed when optimal cytoreduction could be achieved by the standard surgery (32 patients). However, in a few such cases non-standard surgery, meaning resection of one or more organ (e.g., small intestine, colon, spleen), was done to achieve an optimal cytoreduction. Neoadjuvant chemotherapy was given to those patients who were deemed unresectable due to disease related or, inoperable due to patient related factors. The criteria used for selection of patients for neoadjuvant chemotherapy followed by interval debulking surgery and adjuvant chemotherapy included general condition of patient not fit for aggressive upfront debulking surgery, optimum cytoreduction not possible, optimum cytoreduction possible at cost of significant morbidity / mortality, extensive pelvic and metastatic tumour load, uncountable peritoneal metastasis, involvement of upper abdominal area especially diaphragmatic area, extensive bowel involvement, involvement of portal triad, stage IV disease especially liver/ lung metastasis and patient refusing for primary surgery.

Response assessment was done by clinical examination, serum CA 125 level, and radiological studies. WHO criteria was used to assess tumour response. Patients responding to NACT were referred for interval cytoreduction. Patients, who did not respond to NACT, were given second line chemotherapy.

Debulking surgery included total abdominal hysterectomy + bilateral salpingoophorectomy + total infragastric omentectomy + peritonectomy limited to the pelvis, paracolic gutters, anterolateral diaphragmatic area + pelvic and common iliac lymphadenectomy + paraaortic lymph node sampling + maximum possible metastatectomy + ascitic and peritoneal cytology.

Chemotherapy (in both neoadjuvant and adjuvant setting) used was Cisplatin (intravenous) – 75mg/m² + Paclitaxel (in-

travenous) 175mg/m², over 3hrs with adequate hydration and premedication. This regimen was repeated every 3 weeks.

Blood loss rates, the length of postoperative intensive care unit and/or, hospital stay were used to assess aggressiveness of surgical cytoreduction. Perioperative, postoperative and chemotherapy related complications were recorded in both groups. After completion of treatment, patients were kept on regular follow-up of every three months for first two years, every six months for next three years and then on yearly basis. On each follow-up, patients were assessed by clinical and if needed by radiological and pathological evaluation.

STATISTICAL ANALYSIS

Analysis was done using statistical tool SPSS 11.0. Two-tailed corrected chi-square test and unpaired student's *t*-test were used for P value calculation. For calculation of survival, patients were evaluated at the time of last follow-up. The results were studied on an intention-to-treat basis.

RESULTS

The median follow up in our study was 39 (range of 5 – 84) months. Between January 2003 and June 2010, 72 patients presented with locally advanced epithelial ovarian carcinoma. After surgical exploration, 32 patients seemed resectable and primary cytoreductive surgery was carried out in these patients. They were included in arm 1. Rest 40 patients were found to be unresectable and/or, inoperable. Neoadjuvant chemotherapy was given to them. They were kept in arm 2. The patient and tumour related features are given below in table 1.

In arm 1, all 32 patients tolerated and completed their treatment of primary surgery followed by adjuvant chemotherapy as per the schedule.

In arm 2, all 40 patients tolerated and completed scheduled neoadjuvant chemotherapy. Ten (25.0%) patients did not respond to neoadjuvant chemotherapy. Among them, four (10.0%) patients had stable disease and six (15.0%) patients had progressive disease. They were not operated and planned for second line chemotherapy. Rest 30 (75.0%) patients responded to neoadjuvant chemotherapy. Among them, 24 (60.0%) patients had partial response and 6 (15.0%) patients were complete responders. In those patients responding to chemotherapy, 2 (6.7%) had response after 2 cycles and rest 28 (93.3%) after 3-4 cycles of chemotherapy. All these 30 responding patients were subjected to interval debulking surgery followed by adjuvant chemotherapy (rest 2-4 cycles). All of them completed their assigned treatment. In this group, the mean interval between surgical staging and the start of chemotherapy was 15 (range 5–33) days after laparoscopy and 19 (range 7–41) days after laparotomy. Evaluation of surgical results is given below in table 2.

Non standard surgeries included small intestinal resection, colectomy, low anterior resection, partial gastric resection, partial cystectomy and splenectomy.

Findings during surgery and perioperative events are given below in table 3. Most important findings were significantly less perioperative blood loss; hospital / ICU stay in arm 2, with nonsignificant difference in perioperative morbidities. Chemotherapy related complications were comparable in both arms.

There was no significant difference in recurrence rates in the two arms. In both arms, most of the recurrences were in the first 2-3 years of follow-up. As per the sites of relapse, it was more peritoneal in arm 2 and more metastatic recurrence in arm 1 (table 4). Metastatic sites were lung, liver, spleen and brain. Statistics shows trend towards better survival in patients who received NACT (table 4). However, no definite conclusion could be made as the difference as well as the duration of follow up was insufficient. The recurrence pattern

and the survival analysis are given below in table 4.

DISCUSSION

Ovarian carcinoma is the leading cause of gynecologic cancer-related deaths in most advanced countries, as it leads to death of approximately half of patients.¹¹ In most patients, it is in the advanced stage at the time of presentation. Management of advanced ovarian cancer is a difficult and challenging task.¹² In management of both early and advanced carcinoma ovary, optimal cytoreduction by primary debulking surgery (PDS) followed by platinum and taxol based adjuvant chemotherapy, has been standard of care.^{1,2} However, primary cytoreduction has not been established as the standard of care, by any prospective randomized trial

	Arm 1 (n = 32)	Arm 2 (n = 40)	P value
Age (years) Mean +/- SD	53.0 +/- 9.0	58.0 +/- 4.5	0.003
30-40 years	2 (6.2%)	2 (5.0%)	0.8
41-50 years	14 (43.8%)	13 (32.5%)	0.46
51-60 years	13 (40.6%)	19 (47.5%)	0.7
61-70 years	3 (9.4%)	6 (15.0%)	0.7
Disease stage			
III	19 (59.3%)	22 (55.0%)	0.89
IV	13 (40.7%)	18 (45.0%)	0.89
Tumour grade			
1	8 (25.0%)	5 (12.5%)	0.29
2	19 (59.4%)	26 (65.0%)	0.16
3	5 (15.6%)	09 (22.5%)	0.66
Tumour histology			
Serous	15 (46.8%)	20 (50.0%)	0.98
Mucinous	5 (15.6%)	4 (10.0%)	0.72
Undifferentiated	12 (37.5%)	16 (40.0%)	0.83
CA-125(>30KU/L)	27 (84.4%)	35 (87.5%)	0.97
Staging procedure			
Laparoscopy	21 (65.6%)	23 (57.5%)	0.65
Laparotomy	11 (34.4%)	17 (42.5%)	0.65

Table-1: Patient and tumour characteristics

Surgical results	Arm 1 (n = 32)	Arm2 (n = 30)	P value
Optimum Cytoreduction	17 (53.1%)	25 (83.3%)	0.02
Suboptimum Cytoreduction	15 (46.8%)	5 (16.7%)	0.02
Nonstandard Surgery	11 (34.4%)	8 (26.6%)	0.7
Organ Resected			
Small Bowel	5 (15.6%)	3 (10.0%)	0.78
Colon	4 (12.5%)	3 (10.0%)	0.76
Bladder	1 (3.1%)	1 (3.3%)	0.96
Spleen	1 (3.1%)	0 (0.0%)	0.33
Stomach	0 (0.0%)	1 (3.3%)	0.97

Table-2: Surgical results

Operative Finding	Arm 1 (n = 32)	Arm 2 (n = 30)	P value
Advanced Disease	32 (100%)	30 (100%)	1.0
Ascites	28 (87.5%)	26 (86.6%)	0.92
Omental Disease	24 (75.0%)	18 (60.0%)	0.32
Peritoneal Disease	20 (62.5%)	12 (40.0%)	0.13
Paraortic Lymphadenopathy	6 (18.8%)	6 (20.0%)	0.9
Subdiaphragmatic Nodules	16 (50.0%)	12 (40.0%)	0.59
Liver Deposits	5 (15.6%)	3 (10.0%)	0.78
Largest Metastatic Size			
2cm	31 (96.8%)	21 (70.0%)	0.01
5cm	17 (53.1%)	9 (30.0%)	0.11
Surgery Duration			
Mean (minutes)	186	164	0.28
Range (minutes)	70.0-350.0	90.0-270.0	
Blood Loss Rate			
Mean (cc)	2203	1148	0.001
Range (cc)	50.0-5000.0	50.0-3000.0	
ICU Stay			
Mean (days)	5.3	3.0	0.0001
Range (days)	1.0-9.0	1.0-5.0	
Hospital Stay			
Mean (days)	28.6	16.1	0.0001
Range (days)	6.0-50.0	4.0-30.0	
Perioperative Mortality	2 (6.3%)	1 (3.3%)	0.59
Perioperative Morbidity			
Wound Infection	4 (12.5%)	3 (10.0%)	0.76
Wound Dehiscence	1 (3.1%)	1 (3.3%)	0.96
Fever	5 (15.6%)	1 (3.3%)	0.23
Chest Infection	1 (3.1%)	1 (3.3%)	0.96
Intestinal Fistula	3 (9.4%)	2 (6.6%)	0.69
Intestinal Obstruct.	1 (3.1%)	1 (3.3%)	0.96
Urinary Fistula	1 (3.1%)	0 (0.0%)	0.33
DVT / Embolism	1 (3.1%)	2 (6.6%)	0.95

ICU: Intensive care unit, DVT: Deep venous thrombosis

Table-3: Surgical findings and Perioperative events

	Arm 1 (n = 32)	Arm 2 (n = 30)	P value
Recurrence Pattern			
Peritoneal Recurrence	5 (15.6%)	7 (23.3%)	0.65
Metastasis	4 (12.5%)	2 (6.7%)	0.73
First year recurrence rate			
0-3 month	1 (3.1%)	0 (0.0%)	0.33
4-6 month	1 (3.1%)	0 (0.0%)	0.33
7-9 month	2 (6.3%)	2 (6.7%)	0.95
10-12 month	5 (15.6%)	3 (10.0%)	0.78
5-year DFS Rate	9 (27.0%)	9 (29.0%)	0.87
5-year OS Rate	10 (31.0%)	9 (30.0%)	0.9
Median PFS (months)	7.59	9.87	0.05
Median DFS (months)	19.0	22.0	0.4
Median OS (months)	28.0	25.0	0.5
PFS: Progression-free survival, DFS: Disease-free survival, OS: Overall survival			
Table-4: Recurrence and survival analysis			

till yet.¹³ Various randomized trials and meta analysis have shown that “optimum cytoreduction and amount of residual disease after surgery” are the most important modifiable prognostic factors for survival in ovarian cancer.^{14,15} The fact that, the amount of post operative residual disease, significantly affects survival, makes the optimum cytoreductive surgery, a very crucial component in management of ovarian cancer. According to Gynaecological Oncology Group, the definition of optimum debulking is “Nil visible or, palpable residual disease or, minimum goal of <1cm or, preferably 0.5cm of residual disease”. Also, after optimum cytoreduction is achieved, survival is same irrespective of surgery, if it is radical or, non radical surgery. Unfortunately, in 60-70% patients, there will be only little benefit from primary debulking surgery, as optimum debulking is not possible, due to widespread extension of disease at presentation. Other than aggressive surgery, tumour biology is also a factor that determines the prognosis of surgery as is shown in several trials.¹⁶⁻¹⁸ Advanced stage at presentation and biology of the tumour, co-determine the poor prognosis and dismal survival in these patients. On the other side, chemotherapy has shown good response rate even in advanced stages of ovarian cancer. It has lead to various studies and trials incorporating chemotherapy in the neoadjuvant setting. Other possible advantages of neoadjuvant chemotherapy are that, due to the advanced stage at diagnosis, patients are usually in poor general condition. NACT leads to improved patient’s performance status prior to surgery, owing to the reduction in tumour volume. Nutritional improvement ensues due to control of disease and relief of distressing symptoms of abdominal distension and discomfort, resulting in improved surgical results. Tumour volume reduction also leads to enhancement of sensitivity to chemotherapy.¹⁹ NACT also allows the in vivo assessment of tumour chemo sensitivity, which makes it easy to choose appropriate chemotherapy regimen. In the beginning, NACT was mainly used in pa-

tients who were medically unable to tolerate aggressive cytoreductive surgery. Later, this approach has been employed in women who, by diagnostic analysis, were unlikely to undergo successful optimal cytoreductive surgery.²⁰ Recently, interval debulking surgery has been introduced as a new concept, meaning a surgical procedure with debulking intent foreword and followed by cytoreductive chemotherapy.²¹ In some studies, platinum based chemotherapy regimens, in addition to producing higher response rates, have also shown to give a statistically significant survival advantages compared with drug regimens without platinum.^{3,22} Unfortunately, most of the studies done, in this setting of neoadjuvant chemotherapy followed by secondary cytoreductive surgery are retrospective in nature.³⁻¹⁰ They have shown mixed results, mainly in favor of this modality of treatment with increase rate of optimum cytoreduction, less rate of aggressive mutilating surgery, less morbidity and mortality, and similar or, better quality of life (QoL), median survival, disease-free survival (DFS) and overall survival (OS). After review of various trials and meta-analysis, it has been recommended by Gynaecological Cancer Intergroup Ovarian Cancer in the Consensus Conference (2004) that, “In advanced ovarian cancer, upfront maximum cytoreduction by primary debulking surgery (PDS), with goal of no residual disease should be undertaken, and when this is not possible, interval cytoreductive surgery (IDS), after 3-5 cycles of neoadjuvant chemotherapy, should be considered in patients who don’t have progressive disease”.²³ An area of controversy are the criterias which will define the resectability of the tumour and consequently will lead to the selection of patients which might benefit from NACT approach. Different studies have used imaging based criteria for this purpose.^{24,25} Nelson *et al.* showed, that the predictive value of a computed tomography scan demonstrating non resectability was only 67%.²⁴ A predictive index was developed by Bristow *et al.*, that was able to correctly predict surgical outcome.²⁶ The ability to identify patients undergoing optimal debulking was 80%. Ansquer *et al.*³ and Vergote *et al.*²¹ showed that, laparoscopy and in certain situations exploratory laparotomy can be used as a selection tool. Histological diagnosis, objective documentation of the extent of the disease and identification of patients who can be optimally debulked, are the possible benefits of such a procedure. Proper technique and immediate start of chemotherapy can overcome the issue of port site implantation, when such procedures are done.²⁶ In this retrospective analysis, we found that those patients, who were deemed unresectable or, inoperable because of disease or, patient related factors, they responded significantly well to neoadjuvant chemotherapy. Because of such response to neoadjuvant chemotherapy, there was significant increase in rate of optimum cytoreductive surgery in those patients. Our observations are similar to some of previous studies, which reported similar optimal debulking rate following NACT.²⁷ The most important aspect of this study was that, not only increased optimum surgery could be done in such poor prognostic pa-

tients, but also it was done with less aggressive approach depicted by significantly less blood loss rate, hospital / ICU stay and nonsignificant less rate of non standard surgeries to achieve optimum debulking along with less perioperative morbidities. These findings are consistent with the data of Schwartz *et al.*²⁰ who reported that neoadjuvant chemotherapy leads to decrease in the aggressiveness of debulking surgery. There was no significant gain in disease free survival (DFS) and overall survival (OS). Regarding overall survival, some previous studies have results similar to us,^{7,21,28} but some have shown gain in survival with NACT.^{5,29} The nonsignificant difference in disease free survival between the two arms is similar to the results of previous studies.¹⁸ But it should be considered here that, in the neoadjuvant chemotherapy arm 2, patients were in poorer prognostic state than the conventional arm 1, according to disease and patient condition. The limitations of this study are that it is retrospective in nature, has small sample size, short follow-up, and the data regarding the quality of life or, disease free progression, are incomplete.

CONCLUSION

In this study, we found that ovarian cancer even in advanced stages shows good response rate to neoadjuvant chemotherapy. It leads to significantly increased optimum cytoreductive surgery rate, that too with less aggressive approach, perioperative morbidity and mortality. Although, there was no significant gain in survival, but an alternative approach of neoadjuvant chemotherapy followed by interval debulking surgery and adjuvant chemotherapy, which gives equivalent survival to conventional approach of primary debulking surgery followed by adjuvant chemotherapy, can be considered equal or, even better especially in poor prognostic patients. If ongoing randomized trials show that this approach does not adversely affect long term survival, "morbidity related to ovarian cancer management" may evolve as a crucial factor in deciding treatment options.

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Epidemiology of Disability due to Blindness in Prakasham District of Andhra Pradesh, India

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ABSTRACT

Introduction: Blindness is one of the important causes of disability and it is a public health problem worldwide. It is a great concern of the day. Government of India (GOI) is taking several measures to protect the disabled people through various schemes. Rehabilitation Council of India provided legal framework to protect the disabled (RCI). SADAREM (Software to assess disability for Access, Rehabilitation and Empowerment) is a programme to assist the disabled. Empowering the disabled, rights were given to local bodies. The cases of ophthalmic disability were mobilized and referred to tertiary center of the district. The cases were examined by the body constituted for the same. The objective of the present study is to know the grading of disability and reasons for disability

Materials and Methods: The total number of subjects studied during 2012-13 was 1009 cases. The study was conducted at Rajiv Gandhi Institute of Medical Sciences, Prakasham District. The cases referred from all over the district were clinically examined with various parameters. The data collected through SADAREM was analyzed for knowing the causes of blindness and disability. The patients attended tertiary care hospital in the district during 2012 to 2013 under SADAREM Programme was compiled in excel and data taken for the study.

Results: 23 subjects (2.28%) among 1009 only free from visual disability and rest of them with disability of various grades. 280 (27.75%) of the referred patients were completely blind. Corneal pathology in the present study emerged as major cause of disability (15%) and next commonest cause is lens pathology (10%). 4% of cases were with aphakia. Evisceration was done in 13 eyes.

Conclusion: 90% of the referred subjects of district were suffering from ophthalmic disability. 20% of pathology is due to hereditary and congenital. Corneal pathology is the major cause of disability and followed by phthisisbulbi and refractive errors. One out of every 10 is with pathology in retina due to various causes. Among the referred subjects more 1% with enucleated eyes. Regional studies on causes of disability due to eye conditions will be helpful to strengthen eye care services to reduce burden of disability.

Keywords: GOI, SADAREM, Disability, RCI

for 2020 is 322 million.¹ Overall global prevalence is 0.7% but gross variations have been observed in this figure. The estimated disabled due to blindness in India are 15 million.² The prevalence of blindness in certain states like Maharashtra, Odissa, Tamilnadu and Uttar Pradesh is ranging from 1.5 to 1.99. This has gone up to more than 2 in J and K, Madhya Pradesh and Rajasthan states.³

68.8% of global blindness is attributed to three most common conditions, cataract, glaucoma and age related macular degeneration.⁴ 80% of total blindness is in above 50 years age group. According to increased age of population, the proportion of blindness is also increasing. Impaired vision and blindness cause significant effect on quality of life and it is both social and economic loss the individual and his family and to the nation.

In depth study of causes of blindness region wise is necessary to strengthen ophthalmic services in the region. Eye clinics, PHCs, district level and tertiary care level hospitals are dedicated to provide broad spectrum of eye care services. Careful analysis of this data will be useful for better planning and management of limited resources. Governments with the support of private and public partnership are trying to uplift the downtrodden people. The present study is an effort to analyze the data of a tertiary care hospital where the PWDs (People with disabled) were mobilized and for certification to provide social security pensions. Objectives of the research were to know the causes of ophthalmic disability, to identify the high risk groups of community and to assess burden of disability in proportion.

MATERIAL AND METHOD

The study was conducted in 2012-13. Place of study is a ter-

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INTRODUCTION

Disability due to blindness and impairment of vision is a growing concern. The estimated number of this disability is

tiary care hospital in Prakasham District of Andhra Pradesh. The study subjects are the PWDs (People with disability) mobilized from various parts of the district to tertiary care level hospital located at district head quarters. A sample size of 1009 was taken for the study. The referred subjects were examined under similar conditions and with standard guidelines and protocol provided the Government. SADAREM (Software to assess disability for access Rehabilitation and empowerment) was used to collect the data and for the final certification of disability. The subjects were examined by the concerned specialists appointed by the hospital authorities. The author was part of the team.

RESULTS

The total number of patients attended the hospital for certification was 1009. 61% of them were males. 24% of the attended patients were from SC and ST communities and 37% of them were from back ward community. 59% of the patients were below the age of 50 years.

71% of the attended patients were married. 69% of them were without any employment and another 25% were depending on daily wages. 80% of patents attended were illiterate. 28% of the patients are with complete blindness.

Table 1 shows distribution of study group on literacy status wise. Majority of the group under study was illiterate 821 (81.37%). 121 (11.99%) and 30 (2.97%) were literate with primary and 10th standard. 19 (1.88%) studied up to intermediate. 2 of the patients studied diploma in professional course. 13 (1.29%) were having graduation. Only 2 subjects had post graduate qualification.

Table 2 shows distribution of study group as per degree of ophthalmic disability as per the guidelines of GOI. Certification was done by the concerned specialty. They were classified according to degree of disability 5 groups. 376 (37.26%) of the study group classified as disability of 40%. 280 (27.75%) of the referred subjects to the tertiary care hospital for certification were with 100% blindness as per the criteria of GOI. 112 (11.1%) were having 75% disability. Among the referred only 23 (2.28%) were with normal vision.

Table 3 shows distribution of subjects as per pathology of anatomical site of eye ball. Among the studied subjects, in both the eyes the pathological findings were studied by the specialists and classified according to anatomical site of pathology. 133 (12.19%) and 109 (10.8%) in both left and right eyes are free from pathology and normal in their findings. Corneal pathology was emerged out as a major problem in both the eyes 153 (15.16%) and 146 (14.47%) in left and right eyes. Phthisis bulbi was observed in 169 (16.75%) and 177 (17.54%) in left and rights eyes. These are the patients with soft eye, shrunken eye Opacity of lens was observed in 91 (9.02%) 106 (10.51%) in both the eyes. The prevalence of refractive errors in both the eyes was 83(8.23%). Aphakia was observed in 36 (3.57%) and 57 (5.65%) in left and right eyes. Prevalence of Glaucoma was 14 (1.39%) and

10 (0.99%) in left and right eyes. Evicertion was done in 9 (0.89) and 4 (0.4%) in left and right eyes. 3% of studies subjects were suffering with infection.

Among the referred patients from all over the district of Prakasham, 133 and 109 of both left eye and right eye without any ophthalmic disability and their vision is normal. Corneal pathology is contributing significantly for disability. In both the eyes pathology due to cornea is around 15%. Tandon et al and Rekhi et al conducted two studies of hospital based in 2010 and 1991⁵ got the similar type of results of 15.24% of ophthalmic disability is due to corneal pathology. The studies were conducted at New Delhi and Jaipur, India. Lenticular opacity was observed in around 10% of the cases. In the examination, phthisisbulbi is the commonest condition observed. In the present study, 8% of the patients are having refractive errors. Prevalence of glaucoma is around 1%. 4-6% of the patients had aphakia due to surgical inter-

Literacy Status	No	%
Illiterate	821	81.37
Primary education	121	11.99
10Th Standard	30	2.97
Intermediate	19	1.88
Diploma	2	0.2
Graduate	13	1.29
PG	2	0.2
Total	1009	100

Chi Square=20.9; P<0.01

Table-1: Distribution of subjects literacy statuswise

Degree of oph. Disability	No	%
Zero	23	2.28
20	12	1.19
30	206	20.42
40	376	37.26
75	112	11.1
100	280	27.75
Total	1009	100

Chi Square=47.9; P<0.01

Table-2: Distribution of subjects degree of disabilitywise

Morbidity	LT Eye	%	RT Eye	%
Nil pathology	133	12.19	109	10.8
Corneal pathology	153	15.16	146	14.47
Lens	91	9.02	106	10.51
Phthisis bulbi	169	16.75	177	17.54
Glaucoma	14	1.39	10	0.99
Retina	4	0.4	4	0.4
Other	291	28.84	276	27.35
Infections	26	2.58	32	3.17
Refraction	83	8.23	83	8.23
Aphakia	36	3.57	57	5.65
Eviceration	9	0.89	4	0.4
Total	1009	100	1009	100

Chi square=28.2; P<0.01

Table-3: Morbidity according to anatomical site of eye

vention for cataract. Evisceration was done for 9 patients due to various reasons.

Table 4 shows distribution of study group according to disability of eye. 613 (60.75%) of the males were referred for ophthalmic disability to tertiary care hospital. 396 (39.25%) of women consulted for their ophthalmic condition.

DISCUSSION

The present study was conducted in Rajiv Gandhi Institute of Medical Sciences, Ongole, Prakasham District of State Andhra Pradesh during December 2012 to December 2013. During that period, 1009 subjects were taken into the study to know the ophthalmic disability of the patients referred from all over the district under SEDAREM Programme to provide benefit to the disabled persons certified by the institution according to their degree of disability.

Among the referred subjects, 61% males and 39% were females. Mostly there are from socio-economically from backward community (37%) and open category was (34%). 22% of the study group belongs to ST community and 3% each of both ST and Minority groups. In the study group, 59% under the age of 50 years and the rest of them above 50 years age. 72% of the study group was married. 27% were not married and around 1% either divorced or widow/widower. 70% of the referred were unemployed. 25% of the patients were daily wage earners. The remaining was doing petty business.

81% of the study group was illiterate. Even among the literate group, those are having primary education 12%. Rest of them were having high school and above education.

28% of the study group was with 100% blindness on examination. 11% of the study group had 75% of ophthalmic disability.

The major reasons for ophthalmic disability were in the present study, phthisis bulbi. In this condition, complete blindness with loss of structure of eye ball and shrinking of the eye ball was observed (18%). Next commonest condition was corneal blindness (14%). Opacity of the optic lens was observed in (11%) of cases. The prevalence of glaucoma was (1%). Refractive errors were in 8% of patients. Aphakia due to various causes was observed in (6%) of cases. Evisceration of eye ball was done for (0.4%) of cases.

In the estimations done in various countries of the world by Serge Resnikoff et al⁵, 2004, cataract emerged as commonest cause of ophthalmic disability. Second common cause in their study was glaucoma. They observed in their study altering trend of disease burden of eye conditions in both developed and developing countries. Age related macular degeneration is the third common cause in the study done by them. In a study conducted by A. Reidy, D.C. Minassian et al⁶ in 1998, observed 30% of the examined population of above 65 had visual impairment in the general practice (<6/12). 72% of the condition was potentially remediable. 21% of them had vision <6/60 in one or both the eyes. Prevalence of cataract was 30%. 88% of the patients were away from health

Sex	No	%
Male	613	60.75
Female	396	39.25
Total	1009	100
t=0.10; P>0.0		
Table-4: Distribution of subjects disability wise		

services. In their study they found age related macular degeneration 8% and 3% with glaucoma.

A study conducted by Hyman L et al⁷ observed cataract is the commonest cause and it is followed by age related macular degeneration. Third and fourth causes are glaucoma and diabetic retinopathy.

The study conducted by David A et al⁸ found common presenting symptoms of four diseases and they were age related macular degeneration, glaucoma, cataract and Diabetic retinopathy.

The study conducted by TY Wong et al⁹ found different eye conditions in different countries. In 1994, Glaucoma and cataract were the major causes of disability due to eye condition. In Nepal cataract was the main cause. In China, the major causes were cataract and refractive errors. In the same study, a study conducted in Andhra Pradesh to know the prevalence of refractive errors found the prevalence of myopia 19.4%, hyperopia 9.8% and astigmatism 12.9%. Prevalence of glaucoma (POAG) 1.6% and (PACG) 1.1%. Prevalence of retinopathy studied in Andhra Pradesh in 1999 was 22.4% through clinical examination. In Palakka it was in 2002 26.2%. In the study conducted by Aravind Eye Hospital in 2004 found 10.5%. Through photography, the prevalence of retinopathy in Chennai urban and rural Epidemiological study found 5.1%.

In all the above studies, several variations have been observed both geographically and socio-economic development of the regions. Periodic evaluation, continuous monitoring, population and hospital based studies give valuable information to strengthen ophthalmic eye services.

CONCLUSION

90% of the referred subjects of district were suffering from ophthalmic disability. 20% of pathology is due to hereditary and congenital. Corneal pathology is the major cause of disability and followed by phthisisbulbi and refractive errors. One out of every 10 is with pathology in retina due to various causes. Among the referred subjects more 1% with enucleated eyes. Data from various levels through proper analysis will be helpful to establish treatment centers and timely guidance to needy to avoid or minimize disability due to eye conditions in the community.

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Study of Autonomic Variation of Heart Rate in Middle Aged Diabetics

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ABSTRACT

Introduction: The Back ground of this study is that the number of patients with diabetes in India is currently around 40.9 million and is expected to rise to 101 million by 2030. It is estimated that almost one in six people are currently at risk of developing diabetes related complications. Cardiovascular disease (CVD) is the leading cause of mortality and morbidity in patients with diabetes.

Materials and methods: The present study was conducted on 100 middle aged Diabetics attending Diabetic outpatient department, King George Hospital, Visakhapatnam. The patients were divided into two groups, based on age, 36-45yrs and 46-55yrs. Parameters: Resting pulse rate, Deep breathing test, Heart-Rate variation to Valsalva Manoeuvre, Heart rate response to standing - Postural Tachycardia Index (PTI) were measured.

Results: The mean \pm SD of all the parameters above are determined and results were analyzed. 1) Changes within the groups before and after the tests were analyzed by paired 't' test. 2) Inter group changes were analyzed by unpaired 't' test. Discussion: Involvement of nervous system is a well-known complication of diabetes. Neuropathy is one of the most common complications of diabetes. At an early stage autonomic dysfunction may be asymptomatic or mildly symptomatic. Symptomatic autonomic neuropathy carry worst prognosis, so early diagnosis is essential for maximum benefit.

Conclusion: More sympathetic tests have shown significant abnormal responses in diabetics compared to parasympathetic tests.

Keywords: Autonomic variation, Heartrate, Middle aged Diabetics

CVD as well as the vascular complications associated with diabetes.²

Autonomic neuropathies affecting the cardiovascular system cause a resting tachycardia and orthostatic hypotension.¹ Quantitative Autonomic Function Tests consists of a series of simple noninvasive tests for detecting cardiovascular autonomic neuropathy. Autonomic function tests are considered reliable, reproducible, simple and quick to carry out and all of them are non – invasive. The present study is undertaken to assess the severity of adverse effects of diabetes on autonomic functions of CVS which helps in early detection of CAN (Cardiovascular Autonomic Neuropathy) in asymptomatic diabetic and there by promotes timely diagnostic and therapeutic intervention.

Aims and objectives of the study were to assess the functional status of cardiovascular autonomic function in middle aged diabetics and to detect cardiovascular autonomic neuropathy in middle aged diabetic patients on treatment in terms of altered sympathetic and parasympathetic functions which are depicted as changes in Heart rate.

MATERIALS AND METHODS

Selection of Subjects

100 diabetic patients who belong to the middle age group of 35-55 years attending the diabetic outpatient department in King George Hospital, Visakhapatnam are selected.

Inclusion Criteria

- Cases of already diagnosed Type II Diabetes.
- Cases who are in the age group of 35-55 years
- Cases who are attending the diabetic outpatient department in King George Hospital, Visakhapatnam.

Exclusion Criteria

- Patients suffering from cardiac, neuronal and other endocrinal disorders.

INTRODUCTION

Diabetes mellitus (DM) refers to a group of common metabolic disorders that share the phenotype of hyperglycemia.¹ NIDDM occurs mainly in middle aged and elderly, and is much more common than IDDM.² Diabetes mellitus (DM) is a global epidemic affecting at least 8.3% of the global population and 371 million people worldwide with a significant proportion (50%) remaining undiagnosed. The number of patients with diabetes in India is currently around 40.9 million and is expected to rise to 101 million by 2030. Cardiovascular disease (CVD) is the leading cause of mortality and morbidity in patients with diabetes and subsequently the primary goal of diabetes treatment is to reduce the burden of

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- Patients under medications other than oral hypoglycemics

Methods to collect the data

The protocol was explained to the subjects and patients, who volunteered for the present study and informed consent was obtained from each of the participant. The subjects were asked to have light breakfast two hours before the tests and were instructed not to have coffee, tea or cola 12 hours prior to the tests. The subject was asked to relax in supine position for 30 minutes. The resting heart rate was recorded on a standard ECG from lead II, at a paper speed of 25 mm/sec.

Materials

Autonomic function tests can be carried out by using Electrocardiograph, manual recording of pulse and thermometer.

A) PHYSIOLOGICAL PARAMETERS:

Resting pulse rate

The subjects / patients were asked to take rest for 10 minutes and radial pulse rate was recorded in supine position and expressed as beats / min.

Body temperature

The body temperature of the subjects was measured by using a mercury thermometer.

B) PROCEDURE OF AUTONOMIC EVALUATION

In the early 1970's three simple non invasive cardiovascular reflex tests were proposed such as HR response to Valsalva manoeuvre, HR response to deep breathing, HR response to standing up. These tests have been widely used in a variety of studies.³

1. Deep breathing test

In the sitting position subject was asked to breathe quietly and deeply at the rate of 3 breaths per 30sec. A continuous ECG was recorded for 3 cycles with marker to indicate the onset of each inspiration and expiration. The maximum and minimum R-R intervals were measured during each breathing cycles and converted to beats per minute. The result was then expressed as mean of the difference between maximum and minimum heart rate for 3 measured cycles in beats per minute. Deep breathing difference (DBD) = mean of heart rate differences in 3 breath cycles. A normal response was a difference of 15beats/min or more, 11-14 beats/min borderline and less than 10 beats/min was considered abnormal

2. Heart-Rate variation to Valsalva Manoeuvre

The subject was seated comfortably and was asked to blow

into a mouthpiece connected to a mercury sphygmomanometer and holding it at a pressure of 40 mm of mercury for 15 seconds, while a continuous ECG was being recorded. The ECG was continued to be recorded after release of pressure at the end of 15 seconds for 30seconds. The change in heart rate induced by the Valsalva manoeuvre is expressed as the ratio of the maximal tachycardia during the manoeuvre to the maximal bradycardia after the manoeuvre. This ratio was defined as the Valsalva ratio and was calculated as the ratio of maximum R-R interval after the manoeuvre to minimum R-R interval during the manoeuvre. Valsalva ratio (VR) = maximum tachycardia / maximum bradycardia = maximum R-R interval / minimum R-R interval. A value of 1.10 or less is defined as an abnormal response, 1.11-1.20 as borderline, and 1.21 or more as a normal response.

3. Heart rate response to standing - Postural Tachycardia Index (PTI)

The subjects were asked to lie on the examination table quietly while heart rate is being recorded on ECG. They were then asked to stand-up unaided and ECG was recorded for 1 minute. The shortest R-R interval at or around 15th beat and longest R-R interval at or around 30th beat was measured. The result was expressed as ratio of 30/15.

PTI = Longest R-R interval at 30th beat / shortest R-R at 15th beat.

A ratio of 1.00 or less was defined as an abnormal response, 1.01-1.03 as borderline and 1.04 as normal response.

RESULTS

The mean \pm SD of Age of the groups 36-45yrs and 46-55yrs were found to be 41.125 ± 2.95 and 51.51 ± 2.78 respectively. The mean \pm SD of Body Temperature of the groups 36-45yrs and 46-55yrs were found to be 96.74 ± 1.01 and 96.64 ± 2.48 respectively. The mean \pm SD of Resting Pulse Rate of the groups 36-45yrs and 46-55yrs were found to be 82.63 ± 11.14 and 75.20 ± 9.65 respectively. Results were analyzed and expressed in the following ways:

1. Changes within the groups before and after the tests were analyzed by paired 't' test.
2. Inter group changes were analyzed by unpaired 't' test

DISCUSSION

1. Heart Rate Response to Deep Breathing

Percentage distribution of cases according to age groups in normal, borderline & abnormal patterns is given in table no.3 England JD, Gronseth GS, Franklin G, Carter GT et al. in 2009 in their study titled "Evaluation of distal symmetric polyneuropathy: the role of autonomic testing, nerve biopsy, and skin biopsy" stated that heart rate variability with deep breathing is the most widely used test of cardiovascular function and has about 80% specificity.⁴

Christopher H. Gibbons, Roy Freeman, Aristidis Veves, in

the year 2010 recruited 130 individuals: 25 healthy subjects and 105 subjects with diabetes. Heart rate response is significantly lesser in diabetics (8.2 ± 5.0 bpm) when compared with that of normal subjects (16.3 ± 6.7 bpm).⁵

Sixty diabetic patients were taken against age matched controls by Fareeda banu AB, Gorkal AR, NarsimhaSetty KR in 2011 in their study 'a simple test of one minute heart rate variability during deep breathing for evaluation of sympathovagal imbalance in patients with type 2 diabetes mellitus'. Statistically significant decrease in mean minimal heart rate and 1 minute HRV (16.30 ± 6.42 vs 29.33 ± 8.39) was observed during deep breathing among Type 2 Diabetic patients on comparison with that of healthy controls.⁶

S Sucharita, GanapathiBantwal, JyothiIdiculla, VageeshAyyar, and Mario Vaz in their study in 2011, recruited 23 diabetic subjects and their age matched controls. Test of cardiac parasympathetic activity ie timed deep breathing was significantly lower in patients with diabetes compared to the controls ($P < 0.05$).⁷

In a study titled Autonomic changes in preoperative uncomplicated diabetic patients with postural changes by Yun WH et al in 2010, heart rate variability during deep breathing of diabetics and healthy normal subjects were matched in different postures. HRV in diabetic patients was lower than in controls at all positions.⁸

2. Heart rate response to valsalva maneuver

- The abnormal Valsalva response (table No:4) in the subjects may be due early parasympathetic damage involving vagal nerve.

Prakash S B, Asmita S. Nene, Kalpana M in 2014 studied 100 diabetic patients matched against 50 normal healthy controls in their study titled 'A cross sectional study for the evaluation of autonomic nervous system functioning in type 2 diabetes mellitus patients'. The Valsalva ratio was decreased in diabetics (1.24 ± 0.03) as compared to controls (1.27 ± 0.02) which was statistically significant. ($p < 0.01$).⁹

Lata Patil et al in 2013 in a study entitled A Comparative study of heart rate variability during Valsalva maneuver in healthy, hypertensive and diabetic subjects, VR was significantly reduced (1.1883 ± 0.1302) statistically highly significant, which may be because of sympathetic dominance and due to parasympathetic dysfunction.¹⁰

S Sucharita, GanapathiBantwal, JyothiIdiculla, VageeshAyyar, and Mario Vaz in their study in the year 2011, recruited 23 diabetic subjects and their age matched controls. Tests of cardiac parasympathetic activity such as timed deep breathing and Valsalva ratio were significantly lower in patients with diabetes compared to the controls ($P < 0.05$).⁷

Fisher B.M. and Frier B.M. in their study found 5 patients out of 115 of asymptomatic diabetic patients showed abnormal response to Valsalva ratio and 6 out of 9 patients of symptomatic diabetics showed abnormal response to this test.¹⁵

Christopher H. Gibbons, Roy Freeman, AristidisVeves, in

the year 2010 recruited 130 individuals: 25 healthy subjects and 105 subjects with diabetes. Valsalva ratio was significantly less in diabetics (1.26 ± 0.21) when compared with normal subjects (1.54 ± 0.23).⁵

In a study on Influence of cardiovascular diseases upon the results of the cardiovascular reflex tests in diabetic and non diabetic subjects by Kronert et al have opined that, in the old non diabetic and diabetic patients, cardiovascular reflexes were generally impaired but did not show any difference between subjects with and without cardiovascular diseases. In young diabetic patients suffering from cardiovascular diseases, the diagnostic value of cardiovascular reflex tests is reduced as far as cardiac autonomic neuropathy is concerned. The older patients, the tests are not suitable for the diagnosis of diabetic autonomic neuropathy. More specific methods are required.¹¹

3. Heart rate response to standing

The abnormal heart rate response (table No:5) to standing in the subjects may be due to vagal damage as a part of diabetic autonomic neuropathy.

In 2014, Prakash S B, Asmita S. Nene, Kalpana M studied 100 diabetic patients matched against 50 normal healthy controls in their study titled 'A cross sectional study for the evaluation of autonomic nervous system functioning in type

	Deep breathing difference (bpm)	Valsalva ratio	Postural tachycardia index
Mean	13.38	1.21	1.05
SD	6.31	0.13	0.09
SEM	1.29	0.03	0.02

Table-1: Heartrate response to Deep Breathing response and Valsalvamenoeuver in 36-45yrs.

	Deep breathing difference (bpm)	Valsalva ratio	Postural tachycardia index
Mean	12.42	1.17	1.04
SD	7.75	0.12	0.08
SEM	0.89	0.01	0.01

Table-2: Showing Heartrate response to Deep Breathing response and Valsalvamenoeuver in 46-55yrs.

Age group (Yrs)	Total (%)	Normal (%)	Borderline (%)	Abnormal (%)
36-45	24(100)	10(41.7)	2(8.3)	12(50.0)
46-55	76(100)	22(28.9)	17(22.4)	37(48.7)

Table-3: Percentage distribution of cases according to age groups in normal, border line and abnormal patterns in deep breathing difference

Age group (Yrs)	Total (%)	Normal (%)	Borderline (%)	Abnormal (%)
36-45	24(100)	12(50.0)	8(33.3)	4(16.7)
46-55	76(100)	35(46.1)	13(17.1)	28(36.8)

Table-4: Percentage distribution of cases according to age groups in normal, border line and abnormal patterns in valsalva ratio

Age group (Yrs)	Total (%)	Normal (%)	Borderline (%)	Abnormal (%)
36-45	24(100)	15(62.5)	2(8.3)	7(29.2)
46-55	76(100)	42(55.3)	3(3.9)	31(40.8)

Table-5: Percentage distribution of cases according to age groups in normal, border line and abnormal patterns postural tachycardia index

2 diabetes mellitus patients'. Ratio of heart rate on standing decreased in cases as compared to controls ($p < 0.05$).⁹

A study titled 'Cardiac Autonomic Neuropathy (CAN) in Type-1 Diabetes Mellitus Patients and its Association with the Duration of Disease and Glycemic Control' by Haji Khan Khoharo, Shuaib Ansari, Imran Ali Shaikh and Fatima Qureshi in 2009, 24% of the subjects showed borderline response whereas 10% of them showed abnormal heart rate response to standing.¹²

S.N. Chugh, P. Mittal, S. Kumar, K. Chugh in their study in 2011, titled 'QT Dispersion in Patients of Diabetes Mellitus without Manifest Cardiac Dysautonomia' consisted of 50 diagnosed cases of diabetes mellitus. Of them 13 subjects showed abnormal response and 14 subjects were found to have borderline response of heart rate to standing.¹³

In a study titled 'Determination of sensitivity among various cardiovascular autonomic function tests in diabetic patients of Bijapur' done by Chavan NR, Dhundasi SA, Das KK in 2009 recruited eleven diagnosed diabetic patients and fifteen healthy age-matched control subjects were subjected to six standardized cardiovascular autonomic reflex function tests. Only two subjects have shown abnormal response and one subject has shown borderline response of heart rate to standing.¹⁴

CONCLUSION

Involvement of nervous system is a well-known complication of diabetes. Neuropathy is one of the most common complications of diabetes. At an early stage autonomic dysfunction may be asymptomatic or mildly symptomatic. Symptomatic autonomic neuropathy carry worst prognosis, so early diagnosis is essential for maximum benefit.

In conclusion, our present study indicates that:

- More sympathetic tests have shown significant abnormal responses in diabetics compared to parasympathetic tests.
- Probably no single test suffices indicating normality or autonomic neuropathy in diabetics and a battery of tests reflecting both parasympathetic and sympathetic functions is preferable.

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Analysis of Thyroid Disorders in Type - 2 Diabetes Mellitus Patients

Sundara Veena Nethala¹

ABSTRACT

Introduction: Among endocrine disorders after diabetes mellitus condition, thyroid dysfunction is the most common. Thyroid disorders and Diabetes are interrelated conditions and the most common conditions presenting in clinical practice. Neglected thyroid disorders can lead to Diabetes, where as people with diabetes are at increased risk of thyroid disorders. The Present study aim is to find the prevalence of thyroid dysfunction among type - 2 Diabetes mellitus and assessing the thyroid disorders in normal population by comparing with Type - 2 Diabetes mellitus.

Materials and Methods: A total of 140 patients were selected for study, among these 70 were type 2 Diabetes mellitus patients and another 70 were normal subjects. Venous Blood sample collected from all patients and tested for Thyroid hormone levels (T3, T4, TSH). Fasting blood sugar, Random Blood sugar, HbA1c, Lipid profile estimation also done in all patients.

Results: Thyroid dysfunction has seen in 11 out of 70 Type 2 Diabetes mellitus patients about 15.7% and in 3 out of 70 normal subjects about 4.2%. Serum T3 and T4 levels were comparatively lower in Type 2 Diabetes on comparison with normal subjects and TSH levels were higher in Type 2 Diabetes mellitus. Out of 70 Type 2 Diabetes mellitus patients, Hypothyroidism observed in 12.8% (55.5% of Subclinical hypothyroidism, 44.4% of Primary hypothyroidism) and only Subclinical Hyperthyroidism observed in 2.8%.

Conclusion: Thyroid dysfunction causes major impact on Diabetic control and aggravates diabetic complications. Regular screening is necessary for thyroid disease among patients with diabetes mellitus.

Keywords: Diabetes Mellitus, Thyroid disorders, Hypothyroidism, Hyperthyroidism.

INTRODUCTION

Diabetes mellitus is the third leading cause of death in many developed countries. It affects about 2 to 3% of the general population. It is a clinical condition characterized by hyperglycemia due to insufficient production of insulin from beta cells of pancreas or inefficient insulin. Globally the prevalence of Diabetes is increasing because of rising population, population ageing, urbanization, lifestyle changes like physical inactivity, obesity, smoking and medical illness like Hypertension, dyslipidemia.

Diabetes was previously rare in developing countries, but now it's prevalence becoming more in developing countries

as compared to western countries.¹⁻³ Worldwide by 2010, it was estimated that 285 million people suffering with Diabetes mellitus, among which 3.90% had Type 2 Diabetes Mellitus.⁴ Globally by 2030 diabetes mellitus will projected towards 439 million, which represents 7.7% of the total adult population of the world aged 20–79 years.¹ Before Type 2 Diabetes mellitus usually seen in adults, but now it has become more common not only in young adults but also in adolescents and, occasionally, in children.⁵

Among endocrine disorders after diabetes mellitus condition, thyroid dysfunction is the most common. Thyroid is a gland that produces Triiodothyronine (T3), Thyroxine (T4) which are regulated by Thyroid stimulating hormone produced by Hypothalamus. Thyroid disorders are causing problems worldwide. In India about 42 million people suffer from thyroid diseases.⁶

Thyroid disorders and Diabetes are interrelated conditions and the most common conditions presenting in clinical practice.⁷ Diabetes and thyroid disorders are caused by a group of endocrine glands that secrete hormones that help regulate growth, reproduction and nutrient use by cells. Diabetes and thyroid disorders association known since 1979.⁸ Neglected thyroid disorders can lead to Diabetes, where as people with diabetes are at increased risk of thyroid disorders.

When compared with normal population thyroid disorders shown higher prevalence among Diabetics. The prevalence of Diabetes mellitus associated with thyroid dysfunction estimated between 2.2 to 17%⁹ and few other studies observed high prevalence of thyroid dysfunction among Diabetes about 31-46.5%.¹⁰ Thyroid disorders found in both Type 1 and Type 2 Diabetes, but Autoimmune thyroid diseases is commonly seen in Type 1 Diabetes.

Reason for thyroid dysfunction in Diabetes Mellitus may be due to affecting thyroid function at two levels, one is at the level Thyroid stimulating hormone secretion i.e., from hypothalamus and another in peripheral tissue during conversion of thyroxine (T4) to triiodothyronine (T3). Thyroid dysfunction include low T3, elevated levels of reverse T3 (rT3) and low, normal or high levels of T4.¹¹ After treating hyperglycemia these values return to normal level.¹²

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The Present study aim is to find the prevalence of thyroid dysfunction among type - 2 Diabetes mellitus and assessing the thyroid disorders in normal population by comparing with Type - 2 Diabetes mellitus.

MATERIALS AND METHODS

The study has done in the Biochemistry department as a prospective at RIMS, Srikakulam. Informed consent has taken from all the patients.

A total of 140 patients were selected for study, among these 70 were type 2 Diabetes mellitus patients and another 70 were normal subjects. Normal subjects were selected such that their Fasting blood sugar levels and Glycated Hemoglobin (HbA1C) were normal, non-pregnant, no history of usage of steroids, amiodarone, lithium bromide and without any evidence of renal disorders, thyroid disorders. 70 normal subjects matches with type 2 Diabetes mellitus study population by their age and BMI.

Type 2 Diabetes mellitus patients were selected by following the criteria of American Diabetic Association, such as Fasting Blood sugar ≥ 110 mg/dl and Random blood sugar ≥ 200 mg/dl or taking any hypoglycemic medications or insulin or any evidence of ketosis in the past.

Venous Blood sample about 5 ml is collected from all patients in a test tube under aseptic precautions and tested for Thyroid hormone levels (T3, T4, TSH). Fasting blood sugar, Random Blood sugar, HbA1c, Lipid profile estimation also done in all patients.

Thyroid hormone levels (T3, T4, TSH) in the serum sample were estimated by Chemiluminescence Immunoassay (CLIA) Method. Normal values of Thyroid hormone levels: T3 - 0.60-1.81 ng/mL; T4 - 5.01-12.45 μ g/dL; TSH - 0.35 - 5.50 μ IU/mL.

Other variables were estimated by following methods: 1. Estimation of serum glucose by Glucose oxidase-peroxidase method. 2. Estimation of Glycated haemoglobin (HbA1c) by Ion Exchange Resin method Principle. 3. Estimation of serum Total Cholesterol (TC) and High Density Lipoprotein (HDL) by cholesterol oxidase / phenol aminoantipyrine method. 4. Estimation of serum triglycerides (TGs) by glycerol phosphate oxidase – phenol aminoantipyrine method. 5. Estimation of serum Low density lipoprotein (LDL) and Very low density lipoprotein (VLDL) using Friedewald's equation.

Guidelines to detect different types of thyroid dysfunction:

1. Primary Hypothyroidism - TSH more than 5.50 μ IU/mL and T3, T4 less than normal.
2. Subclinical Hypothyroidism - TSH more than 5.50 μ IU/mL and T3, T4 is within normal range.
3. Primary Hyperthyroidism - TSH less than 0.35 μ IU/mL and T3, T4 more than normal.
4. Subclinical Hyperthyroidism - TSH less than 0.35 μ IU/mL and T3, T4 is within normal range. All the results were analyzed and tabulated. Results between Diabetes mellitus patients and Normal subjects were compared.

STATISTICAL ANALYSIS

Statistical Significance assessed using Graph pad software. The P value < 0.05 is considered significant.

RESULTS

Among 140 subjects, 70 were Type 2 Diabetes mellitus (Study Group) and 70 were normal subjects (Control Group). The mean age of Type 2 DM patients were 40.5 ± 2.9 and normal subjects were 41.2 ± 1.7 . There was more female preponderance in both Type 2 DM patients and Normal subjects about 64% and 52% respectively.

All the variables estimated among Type 2 DM patients (70) and normal subjects (70) such as Fasting Blood sugar, Glycated hemoglobin, Total cholesterol, TGs, HDL, LDL, VLDL were compared and significance was analyzed (Table No:1). Except HDL all other lipids and lipoproteins were increased in Type-2 diabetes mellitus significantly.

Table No:1 Various Biochemical changes compared among type 2 Diabetes Mellitus and Normal subjects.

Thyroid dysfunction has seen in 11 out of 70 Type 2 Diabetes mellitus patients about 15.7% and in 3 out of 70 normal subjects about 4.2%.

Thyroid hormones - T3, T4, TSH levels were estimated in Type 2 Diabetes Mellitus patients and normal subjects, tabulated in Table No.2. This shown that serum T3 and T4 levels were comparatively lower in Type-2 Diabetes on comparison with normal subjects and TSH levels were higher in Type-2 Diabetes mellitus.

15.7% of thyroid disorders has seen in Type 2 Diabetes mellitus, among which Subclinical hypothyroidism (45.4%) was more prevalent followed by Primary hypothyroidism,

S. No.	Biochemical changes	Type 2 Diabetes Mellitus	Normal subjects	P value	Significance
1	Fasting Blood Sugar	158.5 \pm 7.99	83.5 \pm 2.3	< 0.0001	ESS
2	Glycated Hemoglobin	7.6 \pm 2.13	5.2 \pm 3.6	< 0.0001	ESS
3	Total Cholesterol	209.7 \pm 3.4	164.3 \pm 1.89	< 0.0001	ESS
4	Triglycerides	159.6 \pm 1.7	128.5 \pm 4.5	< 0.0001	ESS
5	High Density Lipoprotein	40.6 \pm 1.4	44.2 \pm 1.32	< 0.0001	ESS
6	Low Density Lipoprotein	113.5 \pm 6.5	96.5 \pm 2.33	< 0.0001	ESS
7	Very Low Density Lipoprotein	36.5 \pm 4.5	25.6 \pm 4.1	< 0.0001	ESS

Table-1: Various Biochemical changes compared among type 2 Diabetes Mellitus and Normal subjects.

Thyroid hormones	Type-2 Diabetes Mellitus patients (Mean±S.D)	Normal Subjects (Mean±S.D)	P value	Significance
Serum T3	0.92±2.4	1.61±1.4	0.0396	SS
Serum T4	8.11±1.3	9.4±3.1	0.0016	SS
Serum TSH	7.32±2.2	3.21±1.5	<0.0001	ESS

Table-2: Thyroid hormone levels among Type 2 Diabetics and Normal persons

Groups	Gender	Primary Hypothyroidism	Subclinical Hypothyroidism	Primary Hyperthyroidism	Subclinical Hyperthyroidism
Type2 Diabetes Mellitus	Male	2	1	0	0
	Female	2	4	0	2
Normal subjects	Male	0	0	0	1
	Female	1	0	1	0

Table-3: Showing types of thyroid disorders among Diabetics and Normal subjects

Subclinical hyperthyroidism. Females were most commonly diagnosed with thyroid disorders among both groups (Table No:3).

DISCUSSION

As Diabetes and Thyroid disorders were most common presenting conditions in clinical practice. Type 2 Diabetes mellitus (T2DM) condition is more prevalent worldwide, which is a cause for many complications such as diabetic nephropathy, neuropathy, delayed wound healing, infections. Along with these Diabetes patients were also facing problem with thyroid dysfunction.

Diabetics has prevalence of thyroid disorders about 2-50%.^{9,10} In the present study the prevalence of thyroid dysfunction among diabetics was 15.7%. This wide range of prevalence may be due to varying percentage of Diabetics in different communities.

As per this study, TC, TGs, LDL, VLDL, FBS, HbA1C were increased and HDL levels were decreased in Type-2 diabetes mellitus significantly when compared with normal subjects. Sulaiman et al¹³ and Sawant et al¹⁴ also reported that except HDL all other lipids and lipoproteins increased in T2 DM. Few studies¹⁵⁻¹⁸ documented that Overt hypothyroidism results in dyslipidemia among both Diabetics and Non Diabetics.

Thyroid dysfunction has seen in 11 out of 70 Type 2 Diabetes mellitus patients about 15.7% and in 3 out of 70 normal subjects about 4.2%. In line with this study Catiacristina et al,¹⁹ Radaideh AR et al,¹⁰ Perros et al,²⁰ Papzafiropoulou A et al⁸ reported thyroid dysfunction among Diabetics as 14.7%, 12.5%, 13.4% and 12.3% respectively. In contrast to the present study few studies reported high percentage of Thyroid dysfunction among Diabetics like Vikram B vikhe et al - 30%²¹, Ghazia SM et al - 29.7%,²² Gurjeetsingh et al - 30%,²³ LalooDemitrost et al - 31.2%,²⁴ Diaz et al - 32.4%.²⁵ Serum T3 and T4 levels were comparatively lower in Type 2 Diabetes on comparison with normal subjects and TSH levels were higher in Type 2 Diabetes mellitus. This was even supported by other studies.²⁶

Out of 70 Type 2 Diabetes mellitus patients, Hypothyroidism observed in 12.8% (55.5% of Subclinical hypothyroidism, 44.4% of Primary hypothyroidism) and only Subclinical Hyperthyroidism observed in 2.8%. Vikram B vikheet al²¹ reported 22 % had hypothyroidism and 8 % had hyperthyroidism. Laloo demitrost²⁴ observed that 68.8% were euthyroid, 16.3% have subclinical hypothyroidism, 11.4% had hypothyroidism, 2% had subclinical hyperthyroidism and 1.5% were hyperthyroidism cases. Catiacristina et al¹⁹ reported that Subclinical hypothyroidism was more frequent, in 13% of patients with T1DM and in 12% of patients with T2DM.

Thyroid disorders occur in both Type 1 and type 2 Diabetes mellitus.²⁰ Thyroid disorders which goes unidentified could influence negative impact on diabetes and its complications.¹¹ The unrecognized TD may adversely affect the metabolic control and add more risk to an already predisposing scenario for cardiovascular diseases.

CONCLUSION

We conclude that as thyroid dysfunction causes major impact on Diabetic control, regular screening for thyroid disease among patients with diabetes mellitus should perform. By considering the prevalence of Thyroid disorders among Diabetics and as there is possibility of aggravation of complications such as hypertension, dyslipidemia among Diabetics due to undiagnosed thyroid dysfunction.

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Comparative Study of Efficacy of Two Different Doses of Epidural Dexmedetomidine (0.6µg/kg and 1µg/kg) with 0.75% Ropivacaine for Inguinal Hernioplasty

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ABSTRACT

Introduction: Epidural anaesthesia is one of the most common regional anaesthetic technique used for lower abdominal and lower limb surgeries. Various adjuvant are being used with ropivacaine for prolongation of intra operative and post-operative analgesia in epidural block. Dexmedetomidine, the highly selective α_2 adrenergic agonist is a new neuraxial adjuvant gaining popularity. Dexmedetomidine has dose dependent action when used intrathecally and not much studies have been conducted to determine the efficacy of different doses of dexmedetomidine in epidural anaesthesia. So in our study we selected two different doses of dexmedetomidine (1 and 0.6µg/kg) to determine the efficacy with ropivacaine. Aim of the study was to evaluate the efficacy of two different doses of dexmedetomidine (0.6µg/kg and 1µg/kg) as an adjuvant to ropivacaine 0.75% in epidural anaesthesia for elective inguinal hernioplasty surgeries.

Materials and methods: One Hundred Patients scheduled for elective inguinal hernioplasty under epidural anesthesia participated in this study. They were assigned into two groups: Group A (n = 50), 15ml of 0.75% ropivacaine plus 0.6µg/kg Dexmedetomidine given and in Group B (n = 50), 15ml of 0.75% ropivacaine plus 1 µg/kg of Dexmedetomidine given. The Following variables were studied: onset of sensory and motor block, duration of sensory and motor block, maximal dermatomal level of analgesia.

Results: Group B had rapid onset of sensory and motor blockade (p<0.05), prolonged duration of sensory, motor block (p<0.05), and determine more intense motor block (p<0.05), greater sedation scores compared group A. Side effects like hypotension and bradycardia were observed more with group B but it was not statistically significant. There was no difference in the maximal dermatomal level of analgesia.

Conclusion: Epidural Dexmedetomidine at 1 µg/kg as an adjuvant to 0.75% Ropivacaine is associated with prolonged sensory and motor block, hemodynamic stability, more intense motor block and greater sedation scores when compared to dexmedetomidine 0.6 µg/kg with Ropivacaine.

Keywords: Dexmedetomidine, Ropivacaine, Epidural block

nal surgeries. The advantages of epidural anaesthesia being it^{1,2}, provides good surgical anaesthesia and can meet the extended duration of surgical needs, provides post operative analgesia, reduces the incidence of hemodynamic changes. Different local anaesthetics are tried for epidural anaesthesia³, most popular in India being Lidocaine and Bupivacaine. The drawback of lidocaine is its intermediate duration of action and the drawback of bupivacaine is the increased incidence of fatal cardiac toxicity after accidental intravascular injection, because of narrow cardiovascular collapse/central nervous system toxicity (cc/cns).⁴ For this reason, there has been a search for alternative drugs with desirable blocking properties of bupivacaine but with a greater margin of safety. Ropivacaine and levobupivacaine are the newer long acting amide local anaesthetics which have a wide margin of safety compared to bupivacaine, with all its advantages.⁴

Recently Ropivacaine has been introduced, since Ropivacaine has all the advantages of bupivacaine with less cardiac toxicity⁵, it appears that it may be an ideal local anaesthetic for epidural anaesthesia. Various studies have found, Ropivacaine to be an effective local anaesthetic for epidural anaesthesia^{6,7,8,9}, Richard Arthur et al.¹⁰ in their comparative pharmacokinetics of bupivacaine and ropivacaine have found that when applied directly to an isolated vagus nerve preparation, ropivacaine was less potent than bupivacaine in terms of conduction blocks of Aβ fibers, but ropivacaine blocked Aδ and C fibers to a greater extent than did bupivacaine. It is also found that lipid solubility of Ropivacaine is 2.9 compared with 3.9 of bupivacaine.¹¹ Hence, in our study ropivacaine was selected as the study drug.

The fear of surgery, strange surroundings of the operation

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INTRODUCTION

Epidural anaesthesia is one of the most popular regional anaesthesia technique used for lower limb and lower abdomi-

theatre, the sight and sound of sophisticated equipments, the masked faces of many strange personele makes the patient panic to any extent.

Sedation, stable haemodynamics and an ability to provide smooth and prolonged post-Operative analgesia is the main desirable qualities of an adjuvant in neuraxial anaesthesia.

α -2 adrenergic agonists have both analgesic and sedative properties when used as an adjuvant in regional anaesthesia. Dexmedetomidine is a highly selective α_2 adrenergic agonist with an affinity of eight times greater than clonidine. Various studies have shown that the dose of clonidine is 1.5 – 2 times higher than dexmedetomidine when used in epidural route.

The anaesthetic and the analgesic requirement get reduced to a huge extent by the use of dexmedetomidine because of its analgesic properties and augmentation of local anaesthetic effects as they cause hyperpolarisation of nerve tissues by altering transmembrane potential and ion conductance at locus ceruleus in the brainstem.¹² The stable haemodynamics and the decreased oxygen demand due to enhanced sympathoadrenal stability make it a very useful pharmacologic agent.

Considering the dose dependent action of intrathecal dexmedetomidine¹³ we hypothesize that higher dose of dexmedetomidine used as an adjuvant in epidural anaesthesia with ropivacaine would result in better efficacy profile by further prolonging the sensory and motor blockade. Not much studies have been conducted to determine the efficacy of different doses of dexmedetomidine epidurally. So in our study we selected two different of dexmedetomidine (1 and 0.6 μ g/kg) to determine the efficacy with epidural ropivacaine.

MATERIALS AND METHODS

A study entitled “Comparative study of efficacy of two different doses of epidural Dexmedetomidine (0.6 and 1 μ g/kg) with 0.75% Ropivacaine for inguinal hernioplasty” was undertaken in Kempegowda Institute of Medical Sciences (K.I.M.S) hospital, Bangalore during the period October 2011 and July 2013. The study was undertaken after obtaining ethical committee clearance as well as informed consent from all patients.

One hundred patients, scheduled for various elective inguinal hernioplasty surgeries belonging to ASA class I and II were included in the study. The study population was randomly divided using computer generated randomization numbers into two groups with 50 patients in each group.

Group A (n = 50), 15ml of 0.75% ropivacaine plus 0.6 μ g/kg inj Dexmedetomidine in 1ml of normal saline

Group B (n = 50), 15ml of 0.75% ropivacaine plus 1 μ g/kg of inj Dexmedetomidine in 1ml of normal saline

Inclusion criteria for the study

- Adult patients aged between 18 to 65 years of both sex.
- Patients belonging to ASA class I and II posted for elective lower abdominal and lower limb surgical procedures.

- Weight > 50 kgs, Height 150-180cms

Exclusion criteria for the study

- Patient refusal for regional anaesthesia.
- Pregnancy and lactation.
- Patients posted for Emergency surgeries.
- Obese patient with BMI > 30.
- Patients having:
 - raised intracranial pressure
 - severe hypovolemia
 - bleeding coagulopathy
 - local infection
 - uncontrolled hypertension/ diabetes mellitus
 - neurological disorder and deformities of spine
 - cardiac disease
 - hepatic disease
 - allergy to local anaesthetics and dexmedetomidine

METHODS

A routine pre-anaesthetic examination was conducted on the evening before surgery. The patients were premedicated with tablet alprazolam 0.5 mg and tablet ranitidine 150 mg orally at bed time on the previous night before surgery. They were kept nil orally 10 pm onwards on the previous night.

On the day of surgery, patient's basal pulse rate and blood pressure were recorded. A peripheral intravenous line with 18 gauge cannula after local anaesthesia was secured in one of the upper limbs. All the patients were preloaded with 500 ml of Ringer lactate 30 minutes prior to the epidural procedure. Multiparameter monitor was connected which records heart rate, non-invasive measurement of systolic blood pressure (SBP), diastolic blood pressure (DBP), mean arterial pressure (MAP), continuous electrocardiogram (ECG) monitoring and oxygen saturation (SPO₂).

With the patients in sitting position under aseptic precautions, epidural space was identified by loss of resistance technique to air using 18G Tuohy needle via the midline approach at either L2-3 or L3-4 inter spinous space. An epidural catheter was threaded and fixed at 3 cms inside the epidural space. A test dose of 3 ml of 2% lignocaine with 1:200000 adrenaline was injected through the catheter after aspiration. After ruling out intrathecal and intravascular placement of the tip of the catheter, study drug was injected in increments of 5 ml. The patients were turned to supine position after 1 min.

Assessment of sensory and motor blockade were done at the end of each minute with the patient in supine position after completion of the injection of 16 ml of the study drug, which is taken as the starting time. The onset time for sensory and motor block, the maximum level of sensory block, intensity of motor block and sedation score were recorded. Sensory blockade was assessed using a short bevel 22 gauge needle and was tested in the mid clavicular line on the chest, trunk and lower limbs on either side.

Motor blockade in the lower limbs was assessed using mod-

ified Bromage scale.

0 – able to perform a full straight leg raise over the bed for 5 sec

1– unable to perform the leg raise but can flex the leg on the knee articulation

2 – unable to flex the knee but can flex the ankle

3 – unable to flex ankle but can move the toes

4 – unable to move toes (total paralysis).

Measurements of blood pressure, heart rate, and oxygen saturation will be recorded every 5 minutes till the end of 1 hour and then every 15 minutes till the end of surgery.

Sedation scoring as per (Five point scale):

Alert and wide awake	1
Arousable to verbal command	2
Arousable with gentle tactile stimulation	3
Arousable with vigorous shaking	4
Unarousable	5

Intraoperatively and postoperatively complications like fall in blood pressure, variation in heart rate were noted, treated and tabulated After the surgery, patients referred to the recovery room (PACU) post anaesthesia care unit where they remained until there was complete recovery of sensory and motor blockade. Epidural top up was given with 8ml of 0.2% inj.ropivacaine once the patient complains of pain. Postoperatively vital parameters will be recorded every 15 minutes, and also duration of sensory and motor blockade.

RESULTS

Table 1 shows the demographic data of the patient's studied. There was no statistically significant difference between the groups with respect to mean age, weight, height and gender. Table 2 shows the characteristics of sensory and motor block in both the groups. There was statistically significant difference between the groups with respect to the onset of sensory and motor block ($p < 0.05$). There was significant prolongation of sensory block, motor block in group B compared to group A ($p = 0.000$).

Table 3 shows the maximum sensory level attained in both groups. 8 patients in group B had attained T5 level

Table 4 shows intensity of motor block in both the groups. 20 patients in group B had modified bromage scores 4 and 12 in group A

Table 5 shows sedation scores of two groups.group B had higher sedation scores compared to group A and it was statistically significant ($p < 0.05$).

DISCUSSION

In this study, the hypothesis that higher dose of dexmedetomidine used as an adjuvant in epidural anaesthesia with ropivacaine would result in better efficacy profile by further prolonging the sensory and motor blockade

In our study, the drugs selected for epidural anaesthesia were

Ropivacaine and dexmedetomidine Ropivacaine, has structural similarity to bupivacaine. Without cardiotoxic effects of bupivacaine, has been introduced to Indian market recently. Dexmedetomidine has been studied by various authors as an adjuvant to epidural local anaesthetic.¹⁴⁻²¹ Few studies have compared ropivacaine and dexmedetomidine for epidural anaesthesia in India.¹⁸

Presynaptic activation of alpha-2A adrenoceptor in the locus ceruleus inhibits the release of nor-epinephrine and results in the sedative and hypnotic effects.²² In addition, the locus

	Group A	Group B	P Value
Age in years Mean±SD	32.19 ± 11.1	32.8 ± 10.12	0.962
Weight in kgs Mean±SD	58.64 ± 5.17	56.10 ± 6.11	0.27
Height in cms	170	169.3	0.825
Gender M/F	36/15	34/17	0.69

Table-1: Demographic data of the study subjects

	Group A	Group B	P-value
Mean time for Onset of sensory block (min)	5.26±1.49	2.51±0.62	0.012
Mean time for Onset of motor block (min)	11.22±3.28	9.24±0.56	0.031
Mean duration of sensory block (min)	359.30± 61.94	520.39 ± 20.21	0.000
Mean duration of motor block (min)	233.70± 15.36	362.24 ± 17.26	0.000

Table-2: Characteristics of sensory and motor block in both the groups

Max Sensory level	Group A (No. of patients)	Group B (No. of patients)	p-value
T5	0	8	
T6	31	35	
T8	17	6	0.010
T10	2	1	

Table-3: Maximum level of sensory blockade attained

	Group A	Group B	p-value
Bromage 2	3	0	<0.001
Bromage 3	35	30	0.35
Bromage 4	12	20	<0.001

Table-4: Grade of motor blockade

Sedation score	Group A	Group B	p-value
S1	12	0	
S2	33	15	
S3	5	29	0.001
S4	0	6	

Table-5: Sedation score

ceruleus is the site of origin for the descending medullospinal noradrenergic pathway, known to be an important modulator of nociceptive neurotransmission. Stimulation of alpha-2 adrenoceptors in this area terminates the propagation of pain signals leading to analgesia. Postsynaptic activation of alpha-2 receptors in the CNS results in decrease in sympathetic activity leading to hypotension and bradycardia.²³ Alpha -2 adrenoceptors present on primary afferent terminal (peripheral and spinal endings), in the superficial laminae of the spinal cord and within several brainstem nuclei have been implicated in the analgesia, supports the possibility of analgesic action of alpha agonist at peripheral, spinal and brainstem site.

According to the results, the demographic profile in the present study was comparable and did not show any significant difference ($p > 0.05$). We found that there was a significant difference in the onset of sensory and motor block with group B compared to group A.

It was found that the total duration of sensory block was significantly prolonged in Group B (520.39 ± 20.21 min) which is in concordance with the results of Kaur S et al²⁴ (535 min) as they had taken 20 ml of ropivacaine compared to Group A (359.30 ± 61.94 min).

Total duration of motor block (regression to Bromage 0) in Group B was 362.24 ± 17.26 min which is in concordance with the results of Kaur S et al²⁴ (385 min) as they had taken 20 ml of ropivacaine. Total duration of motor block in Group A was 259.80 ± 15.86 min.

There was also greater enhancement of the intensity of motor block and greater sedation scores with group B compared to group A. It provides better operative conditions and postoperative analgesia.

In group B, 8 patients attained T5 as the maximum sensory level attained. There was no significant difference between groups with regard to occurrence of hypotension and bradycardia at any time of the study. No side effects like pruritis, vomiting, headache, backache, respiratory depression were reported in our study which was similar to other studies.^{25,26} Addition of dexmedetomidine to ropivacaine provides better operating and haemodynamic conditions, with significant postoperative analgesia without increasing the morbidity. Hence higher doses of dexmedetomidine appears to augment the efficacy of epidural ropivacaine.

CONCLUSION

Dexmedetomidine appears to augment the efficacy of epidural ropivacaine in a dose dependent manner without associated increase in adverse effects,

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Prescription Auditing of Antimicrobial Agents in a Tertiary Care Teaching Hospital in Andhra Pradesh

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ABSTRACT

Introduction: Antimicrobial agents are the greatest contribution to 20th century, which are used for cure and prevention of infections. Widespread use of antimicrobials has facilitated the development of resistance. The present study was done to screen rational use of antibiotics in the medicine OPD of a tertiary care teaching hospital.

Material and Method: A total of 850 prescription files were collected from the medicine outpatient department over a period of six months. Prescriptions containing antimicrobial drugs were assessed for appropriateness in dosage, duration of therapy and fixed dose drug combinations (FDCs). The antimicrobials were grouped using the anatomical therapeutic chemical (ATC) codes.

Results: 25.37% of total patients evaluated received antibiotics. Among them 40.15% patients were prescribed one antibiotic and 27.40% were prescribed antimicrobial FDCs. Out of the 248 prescriptions, 47.98% were found to be irrational. The most commonly prescribed antibiotic categories were penicillins (35.79%), followed by fluoroquinolones (16.50%) and combinations of antibiotics from different groups (8.87%).

Conclusion: Rational use of antimicrobial agents is one of the main factors in controlling worldwide emergence of antibacterial resistance, adverse effects and reduced cost of the treatment.

Keywords: ATC codes, Antimicrobials, Fluoroquinolones, Irrational

bial drugs, unsuitable dose, inadequate duration of therapy and use of irrational antimicrobial fixed dose drug combinations (FDCs). Incidence of infectious diseases is common in developing countries resulting in higher consumption of drugs due to non compliance and scarcity of funds favoring the development of drug resistance.³ Though the newer antimicrobials are introduced but the increased demand is unable to meet the slow pace with which new molecules of antimicrobials are introduced into the market. To tackle with this problem, global initiatives are trying to promote rational use of antibiotics.^{4,5} The therapy is considered as rational if the antimicrobial use, its route of administration, dose, frequency and its duration of use are appropriate for the infection. The rational use of antibacterial agents being increasingly recognized as an important contributor to control the worldwide emergence of antimicrobial resistance, to reduce side effects and to decrease the cost of treatment.^{6,7} So, the present study was conducted to assess use of antimicrobial agents in tertiary care hospital of Andhra Pradesh.

MATERIALS AND METHODS

This was a prospective study conducted at the medicine OPD of a tertiary care hospital i.e. Santhiram Medical College and General Hospital, Nandyal, AP. Prescription files from OPD of the teaching hospital were collected on all Saturday over a period of six months (June 2013- December 2013) and taken for analysis. Institutional ethics committee approval was obtained prior to start of the study. The number of drugs prescribed in each prescription was taken into

INTRODUCTION

Antimicrobials (AMA) have changed the outlook of physicians about the power of drugs on the diseases. These drugs are used for various life threatening and trivial infections and their significance is magnified in the developing countries, where infective diseases are leading.¹ But inappropriate and indiscriminate use of antimicrobials have led to the emergence of antibiotic resistant strains, treatment failure and increase in mortality and morbidity.² The worldwide increase in antibiotic resistant bacteria is of great worry but is not described sufficiently in the developing countries. It is the duty of the doctors to develop good prescribing habits which will help in reducing the intensity of the problem. Some of the common causes that contribute to the development of antimicrobial resistance are unnecessary use of antimicro-

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account to calculate the incidence of polypharmacy. The data from the records were entered into a specially designed proforma. The following parameters were recorded for each prescription: patient's demographic profile, diagnosis, drug name, dose, route, frequency and duration of prescription. The patients were categorized by sex and then divided into four age groups. The frequency of prescription was calculated for each age group and for males and females separately. Prescribing frequency was expressed as a percentage of the prescription of the individual drug/drug class in a particular age/sex category to the total number of patients in the particular age/sex category. WHO guidelines were considered for evaluating the rationality of prescriptions. The parameters for evaluation were: (1) Dose strength and dosage schedule (2) Duration of therapy (3) FDCs: rational/irrational. The antibiotics were classified using the Anatomical Therapeutic Chemical (ATC) classification system. In the ATC classification system, the drugs are divided into different groups according to the organ or system on which they act and their chemical, pharmacological and therapeutic properties.⁷

RESULTS

During the study period, prescriptions of 850 patients were studied. It consisted of 449 (52.8%) males and 401(47.1%) females. The age distribution of the patients is shown in Table 1. The most common diagnosis which warranted antibiotic prescription in the medicine OPD was upper respiratory tract infection (35%), followed by diarrhoea (19%) and urinary tract infection (15%). The number of drugs per prescription is shown in Table 2. A total of 295 (34.70%) patients received 2 drugs and 192 (22.50%) patients received only one drug. The average number of drugs per prescription was 2.42.

The duration of antibiotic drug prescription was less than 5 days in 37.73% of the patients and between 5-7 days in 62.27% of the patients.

Out of 850 prescriptions drugs prescribed in the medical outpatient department, the most commonly prescribed drug categories in the descending order were analgesics, anti-ulcer drugs, antibiotics, antihistamines, antihypertensives, oral antidiabetics, antipsychotic drugs, antidepressants, vitamins and haematinics.

Out of 850 patients, 248 (29.17%) received antibiotics. Out of that, 101 (40.15%) patients were prescribed one antibiotic and 68 (27.41%) were prescribed antimicrobial FDCs (Table 3). Out of 248 antimicrobial prescriptions, 47.98% were irrational (Table 4). As per Table 5, the most commonly prescribed antibiotic categories were penicillins (35.7%), closely followed by fluoroquinolones (16.51%) and combinations of antibiotics from different groups (8.87%). ATC codes for each antibiotics were stated. There was no prescription noted with incorrect dosage, incorrect duration of therapy or use of banned drug formulations of antibiotics

DISCUSSION

Inappropriate and indiscriminate use of antimicrobials is a global concern causing selection of resistant strains.⁶⁻⁸ This could result in a substantial economic load on individual and health care systems. Antimicrobial drug resistance refers to non-responsiveness of micro-organisms to an antimicrobial agent. One of the primary reasons for antimicrobial drug resistance is unreasonable use of FDCs. This study was undertaken to assess the rational use of antimicrobial FDCs in the Medicine outpatient of a tertiary level teaching hospital.

Average number of drugs per person is an important index of prescription audit. Mean number of drugs per prescription must be kept as low as possible. Polypharmacy leads to increased risk of drug interaction, side effects, bacterial resistance and also increased cost in hospital. This study showed that most of prescriptions contained two drugs and antimicrobial monotherapy was the main stay. β lactam antibiotics (35.79%), Aminoglycosides (9.27%), sulphonamides (4.83%) and fluoroquinolones (16.05%) were the preferred drugs. β lactam antibiotics were commonly prescribed drugs which was corresponding with the previous studies by Khan FA et al and Das BP et al.^{9,10} This might be due to their round

Age in years	Male (%)	Female (%)
16-30	94	93
31-45	174	165
46-60	113	95
> 60	68	48
Total	449(52.8)	401(47.1)

Table-1: Distribution by age and sex of patients who had visited medicine OPD

No. of drugs per prescription	No. of prescriptions	%
0	42	4.94%
1	192	22.5%
2	295	34.70%
3	234	27.5%
4	48	5.6%
Above 4	39	4.5%

Table-2: Frequency of drugs administered per prescription

Parameter	No. of patients (n=248)	%
Antibiotic prescriptions	248	29.17%
Single antibiotic	101	40.05%
Two antibiotics	45	18.14%
>Two antibiotics	34	13.70%
Antimicrobial FDCs	68	27.41%

Table-3: Number of antibiotics prescribed per patient

Evaluation	No. of patients (n=248)	%
Rational	129	52.01%
Irrational	119	47.98%

Table-4: Evaluation of antibiotic therapy

Drug group	Subgroup	ATC code	No of patients
Tetracyclines	Tetracyclines	J01A	8(3.2%)
Penicillins	Extended spectrum penicillins	J01CA	19(7.66%)
	Combination of penicillins (Amoxicillin and Clavulanic acid)	J01CR	31(12.5%)
Other β -lactams	1st Generation cephalosporins	J01DB	24(9.6%)
	3rd Generation cephalosporins	J01DD	15(6.04%)
Sulfonamide with Trimethoprim	Combination of Sulfonamide with Trimethoprim	J01EE	12(4.83%)
Aminoglycosides	Other Aminoglycosides	J01GB	23(9.27%)
Macrolides	Macrolides	J01FA	20(8.06%)
Quinolones	Fluoroquinolones	J01MA	41(16.5%)
Combination of antibiotics	Combination of antibiotics (Combination of Fluoroquinolones and Nitroimidazole)	J01RA	22(8.87%)
Other antibiotics	Glycopeptide antibiotics	J01XA	5(2.01%)
	Imidazole derivatives	J01XD	8(3.20%)
Agents against amoebiasis and other protozoal diseases	Nitroimidazole derivatives	P01AB	8(3.20%)
	Other agents against amoebiasis and other protozoal diseases	P01AX	12(4.83%)

Table-5: Distribution of antibiotics with ATC codes

the year availability. Among the antimicrobials- amoxicillin, cotrimoxazole and cephalexin were commonly prescribed drugs. Each drug was assigned with ATC code. ATC classification is needed in detecting adverse drug reactions which is the need of the hour. Apart from this, it has a role in drug utilization studies. Our study found that the 75.04 % drugs were prescribed by generic name. This findings were similar with the previous studies.^{11,12} Generic drugs are cheaper than brand name drugs. Moreover, ours is a tertiary care hospital where prescription of generic drugs is always emphasized. But this is in contradiction to some previous studies where brand name drugs were commonly prescribed.¹³ In our study FDC were 27.4%, this matches with the previous study done by Patel S et al.¹⁴ Irrational FDC might have been prescribed based on the patient's requirement or else only rational FDCs were preferred. Doctor should have a clear understanding and knowledge of rational therapeutic use of antimicrobial agents. Doctors should be well versed with the prevalence of pathogens and resistance patterns in their working hospital and work out good practice and decision in selection of the antibiotic regimens.¹⁵ Additionally they should keep abreast of recent strains of pathogens to avoid inappropriate use of drugs. Irrationality can be tackled by proper usage of guidelines, educational programs and surveillance at all level of health care. So, specific procedures should be taken to avoid the inappropriate use of antibiotics. Drug utilization review program should be undertaken to study the rational use of antimicrobials.

CONCLUSION

The rational use of antimicrobial agents is one of the main factor in controlling the global emergence of antimicrobial resistance, adverse effects of drugs and also to reduced cost of the treatment.

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Study on Etiological Profile of Lower Zone Pneumonitis in Patients Attending to the Department of Pulmonary Medicine in Santhiram Medical College and General Hospital, Nandyal

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ABSTRACT

Introduction: Lower zone involvement on chest radiography may be the presentation in cases of a Variety of pneumonias. The aim of our study is to find out the various etiological causes of the lower zone pneumonitis in the patients attending to the department of pulmonary medicine, santhiram medical college and general hospital, Nandyal.

Materials and Methods: All the patients with lower zone pneumonitis attending to the department of pulmonary medicine from january-2014 are included in the study. Patients are subjected to Sputum for AFB examination, Sputum for culture and sensitivity, Sputum for KOH mount, Sputum for malignant cytology, Endo-bronchial washing and Bronchial brushings/biopsy

Results: In present study 5% patients have Interstitial lung disease, 31% patients have Tuberculosis, 47% have CAP, 9% Have Bronchiectasis, 4% have Malignancies 2% have fungal infections and remaining 2% have Tropical Pulmonary Eosinophilia.

Conclusion: Community acquired pneumonia is the commonest cause for lower zone pneumonitis patients followed by tuberculosis. In diabetic patients also CAP is the commonest cause for lower zone pneumonitis.

Keywords: Lower zone Pneumonitis, CAP, Tuberculosis

INTRODUCTION

Lower zone involvement on chest radiography may be the presentation in cases of a Variety of pneumonias. The presentation of bronchiectasis is patchy shadowing, usually in the lower zones and so is the location of pulmonary hydatid cysts. Many a time, lung cancer may present in lower zones, most commonly as multiple nodules

Due to secondaries. In cases of lymphangitic carcinomatosis, the shadows are more obvious in the lower zones as multiple small nodular or linear lesions. Certain diseases like sarcoidosis, pneumoconiosis and progressive massive fibrosis

Produce diffuse radiological shadows. Such shadows may also be seen in advanced interstitial fibrosis, drug reactions, acute allergic alveolitis and fat embolism.^{1,2}

We have tried to study in detail the diseases which may present as bilateral lower zone lung shadows and to com-

pare the initial diagnosis suspected on the basis of clinical and radiological findings with the final clinico-pathological diagnosis.¹

MATERIAL AND METHODS

100 patients attended to the department of pulmonary medicine, Santhiram Medical College and General Hospital, Nandyal were studied. All the patients with lower zone pneumonitis attending to the department of pulmonary medicine from january-2014 are included in the study. A detailed clinical history and a thorough examination was conducted. Routine haematological investigations, Renal Function Tests, chest X-ray and CT Thorax were performed. Sputum for AFB by Z-N staining, pyogenic organisms by Gram's staining, and cytopathological examination was performed along with culture for *Mycobacterium tuberculosis* and pyogenic organisms. Similarly, if needed. Finally, specimen collected by fiberoptic bronchoscopy were smeared and subjected H and E staining.

Patients were subjected to

- A Sputum for AFB examination.
- B Sputum for culture and sensitivity.
- C Sputum for KOH mount.
- D Sputum for malignant cytology.
- E Endo-bronchial washing.
- F Bronchial brushings/biopsy.

Paediatric age group, patients with co-existing upper zone involvement and patients with congestive cardiac failure and pulmonary edema are excluded in our study

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RESULTS

The age of patients ranged from 21 years to 80 years with a mean age of 47.67 Years (Figure No 1 and Table No 1).

Cough was the most common presenting complaint in 88% of cases, followed by dyspnea in 76%, Fever in 73%, expectoration in 42% and chest pain in 28% cases.

On examination crepitation's was the predominant finding in 46% cases followed by clubbing in 12% cases. (Figure No 2) Diabetes was the most common associated medical condition (38% cases), 2% cases had deranged renal functions.

Consolidation was the most common radiographic feature 65% cases followed by nodular shadows in 15% cases, bronchiectatic changes in 10% cases and mass lesions in 4% cases.

Suspected clinical diagnosis were made in all the cases. 6 cases (6%) were diagnosed as sputum positive for acid fast bacilli and 3 cases (3%) diagnosed as Retro-viral and all 3 cases (3%) were diagnosed as Tuberculosis. Community acquired pneumonia was the most common final diagnosis in our study.

Present in 47 cases (47%) out of which 45 cases had an infectious etiology and aspiration pneumonia was diagnosed in 2 cases. Streptococcus Pneumoniae was the commonest organism isolated in 25% cases followed by KlebsiellaPneumoniae in 10% cases, Pseudomonas in 8% cases, Staphylococcus aureus in 2 % cases and mixed organism in 2% cases. Tuberculosis was the next common final diagnosis, in 31 cases (31% of total) out of which 6 cases were diagnosed by sputum for AFB and remaining 25 cases were diagnosed with the help of Fibre-Optic Bronchoscopy. Bronchial Washings for AFB was positive in 25 cases. All the 9 Cases (9%) initially suspected as bronchiectasis had a final diagnosis of bronchiectasis. In 4 Cases CT thorax was confirmatory while the remaining 5 showed characteristic changes of bronchiectasis on chest X-ray.

5 cases (5%) had diagnosis of interstitial lung disease and all the cases had increased neutrophils and eosinophils on BAL fluid. 4 cases (4%) were diagnosed to be malignant, 1 case was adenocarcinoma, 2 cases were squamous cell carcinoma and 1 case was small cell carcinoma. Two cases (2%) suspected tropical pulmonary eosinophilia had their diagnosis confirmed on the basis of increased eosinophils on bronchial lavage fluid examination.

Two cases (2%) were diagnosed as pulmonary candidiasis on the basis of broncho alveolar lavage fluid highly positive for growth of candida. In the Present study Out of 100 Patients 13% falls in 21-40 Years age group, 67% falls in 41-60 Years Age group and rest (20%) falls in above 60 years of age group. In the Present Study 64 % patients were Male and remaining 36% were Females. In present study 5% patients have Interstitial lung disease, 31% patients have Tuberculosis, 47% have CAP, 9% Have Bronchiectasis, 4% have Malignancies 2% have fungal infections and remaining 2% have Tropical Pulmonary Eosinophilia (Table No 2). Most common symptoms/signs were Cough, Fever, Crepitation's and Expectoration.

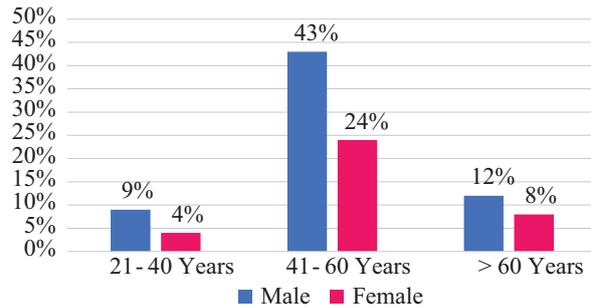


Figure-1: Distribution of Patients according to Age and Sex

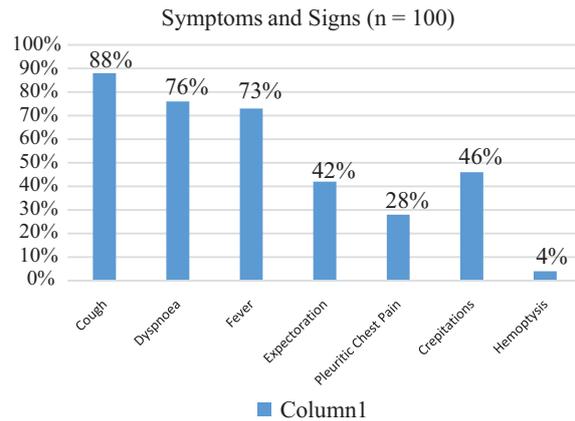


Figure-2: Symptoms and Signs of disease

			Sex		Total
			Male	Female	
Age	21-40 Years	Count	9	4	13
		% within Age	69.2%	30.8%	100.0%
		% of Total	9.0%	4.0%	13.0%
	41-60 Years	Count	43	24	67
		% within Age	64.2%	35.8%	100.0%
		% of Total	43.0%	24.0%	67.0%
>60 Years	Count	12	8	20	
	% within Age	60.0%	40.0%	100.0%	
	% of Total	12.0%	8.0%	20.0%	
Total	Count	64	36	100	
	% within Age	64.0%	36.0%	100.0%	
	% of Total	64.0%	36.0%	100.0%	

Table-1: Distribution of Patients according to Age and Sex

DISCUSSION

In our study out of 100 patients 64% patients were males and 36% patients were females. The mean age in our study was 47.67 years. In a study conducted by RanaSherwani et al¹ mean age was 44.5 years.

In our study the most common symptom was cough (88%) followed by dyspnea (76%), fever (73%), Cough with expectoration was seen in (42%) and pleuritic chest pain in 28% cases. On examination clubbing was seen in 12% cases and crepitations in 46% of our patients. In a study conducted by RanaSherwani et al¹ cough was the most common presenting complaint in 78.5% cases followed by dyspnea in 73.2%, cough with expectoration in 69.6%, fever in 62.5% cases and

		Age			Total
		21-40 Years	41-60 Years	>60 Years	
Interstitial Lung Disease	Count	0	1	4	5
	% within Final Diagnosis	0.0%	20.0%	80.0%	100.0%
Tuberculosis	Count	4	18	9	31
	% within Final Diagnosis	12.9%	58.1%	29.0%	100.0%
CAP	Count	9	37	1	47
	% within Final Diagnosis	19.1%	78.7%	2.1%	100.0%
Fungal Infections	Count	0	1	1	2
	% within Final Diagnosis	0.0%	50.0%	50.0%	100.0%
Bronchiectasis	Count	0	7	2	9
	% within Final Diagnosis	0.0%	77.8%	22.2%	100.0%
Malignancy	Count	0	1	3	4
	% within Final Diagnosis	0.0%	25.0%	75.0%	100.0%
Tropical Pulmonary Eosinophilia	Count	0	2	0	2
	% within Final Diagnosis	0.0%	100.0%	0.0%	100.0%
	Count	13	67	20	100
	% within Final Diagnosis	13.0%	67.0%	20.0%	100.0%

Table-2: Distribution of Patients according to their Diagnosis

chest pain in 37.5% cases. On examination crepitations was predominant finding in 57.5% cases followed by clubbing in 19.6% cases. In a study conducted by Bilal Bin Abdullah et al² cough was the most common presenting complaint in 74% cases followed by cough with expectoration in 64%, fever in 56% cases, dyspnea in 22%, and chest pain in 20% cases. On examination crepitations was predominant finding in 94% cases followed by clubbing in 4% cases. In our study out of 47 Patients (100%) diagnosed as community acquired pneumonia 30 patients (63.8%) were males and 17 (36.2%) patients were females. In a study conducted by Bilal Bin Abdullah et al² 70% patients were males and remaining 30% cases were females.

47 patients out of 100 patients in our study was diagnosed as community acquired pneumonia affected the lower zone. In our Study out of 47 cases (100%) most common organism causing community acquired pneumonia is Streptococcus pneumonia (53.2%) followed by klebsiellapneumoniae (21.3%), pseudomonas aeruginosa (17%), and staphylococcus aureus (4.25%).

In a study conducted by Vishak k acharya et al³ on community acquired pneumonia most common organism casing was streptococcus pneumonia (31%) followed by pseudomonas aeruginosa (15%), Klebsiella pneumonia (13%), and Staphylococcus aureus (8%). In a study conducted by Vinay et al⁴ on community acquired pneumonia Most common organism casing was Streptococcus pneumonia (28%) followed by klebsiellapneumoniae (26.2%), pseudomonas aeruginosa (12.3%) and staphylococcus aureus (20%). In a study conducted by Bilal bin Abdullah et al² on community acquired pneumonia, most common organism casing was Streptococcus pneumonia (16%) followed by klebsiellapneumoniae (6%), pseudomonas aeruginosa (4%) and staphylococcus aureus (2%). In a study conducted by Bansal et al⁵ on community acquired pneumonia, most common organism casing was Streptococcus pneumonia (35.8%) followed by kleb-

siellapneumoniae (22%), pseudomonas aeruginosa (9.4%), and staphylococcus aureus (17%). In a study conducted by Bomagiriraj et al⁶ on community acquired pneumonia, most common organism casing was Streptococcus pneumonia (30.43%) followed by klebsiellapneumoniae (13%), pseudomonas aeruginosa (28.3%) and staphylococcus aureus (4.35%). In a study conducted by Kejriwal et al⁷ on community acquired pneumonia, most common organism casing was Streptococcus pneumonia (48%) followed by klebsiellapneumoniae (1.3%), pseudomonas aeruginosa (11.1%) and staphylococcus aureus (3.3%). In a study conducted by W S Lim et al⁸ on community acquired pneumonia, most common organism casing was Streptococcus pneumonia (56%) followed by klebsiellapneumoniae (13%), pseudomonas aeruginosa (11%) and staphylococcus aureus (3%). In a study conducted by Bashir ahmed et al⁹ out of 100 patients with Community acquired pneumonia Gram -ve organism was commonest (19%), Gram +ve organism (10%) and 71% cases had no etiological cause.

Out of 31 Cases (100%) diagnosed as tuberculosis, 19 patients (61.3%) are males and 12 patients (38.7%) are females. Out of 31 cases (100%) diagnosed as tuberculosis, 16 cases (51.6%) have diabetes mellitus and 3 cases (11.3%) are retro-viral. In a study conducted by Rana Sherwani et al¹ on lower zone pneumonitis Tuberculosis was most common diagnosis, 25% cases with bilateral lower zone shadows were diagnosed as tuberculosis. In our study out of 31 cases (100%) Bronchial alveolar lavage positive for AFB is 74% and sputum positive for AFB is 26%. In a study conducted by Chandrasekhar et al¹⁰ Bronchial alveolar lavage positive for AFB was 15% and sputum positive for AFB was 63%.

In our study out of 100 patients, 9 cases are diagnosed as having bronchiectasis, Out of 9 cases (100%), 4 cases (44.44%) are diagnosed as bronchiectasis by CT THORAX and remaining 5 cases (55.55%) are diagnosed as bronchiectasis by characteristic changes of bronchiectasis on chest X-ray. In

a study conducted by Ranasharwani et al¹ 8.9% cases were diagnosed as having Bronchiectasis.

In our study out of 100 patients 4% (4 cases) having malignancy. Out of 4 cases 1 case is diagnosed as adenocarcinoma, 2 cases are diagnosed as Squamous cell carcinoma and 1 case is diagnosed as small cell carcinoma. In a study conducted by Ranasherwani et al¹ on bilateral lower zone shadows, out of 56 patients 9 % cases were diagnosed as malignancy and most common type was broncho alveolar carcinoma.

In this study out of 100 patients 5 (5%) cases were diagnosed as having interstitial lung disease. In all these 5 patients Sputum and FOB analysis were negative for AFB, Bacterial and Fungal culture. Diagnosis is done based on HR CT Thorax findings and Restrictive pattern on spirometry (Helios 401).

In a study conducted by Rana Sherwani et al¹ 7.14% cases were diagnosed as interstitial lung disease, all the cases had increased neutrophils and eosinophils on BAL fluid Examination.

In our study out of 100 patients 2 cases are diagnosed as fungal infections, In this 2 patients Sputum is negative for AFB staining and no bacterial growth on sputum culture, BAL was negative for AFB staining and no bacterial growth on BAL culture and BAL is Positive for candida species. In a study conducted by Rana sherwani et al¹, 1 case (1.78%) out of 56 patients (100%) was diagnosed as having pulmonary candidiasis.

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Implementation of Artemisinin based Combination Therapy Policy in Treatment of Uncomplicated Malaria in Private Medicines Outlets: Practice of Medicines Dispenser's in Mwanza Region, Tanzania

Stanley Mwita¹, Angela Jesse², Deogratus Katabaro¹, Carol Marwa³, Deodatus Ruganuzza⁴

ABSTRACT

Introduction: A combination of Artemether-lumefantrine (ALu) is recommended by Tanzania MoHSW as first line therapy for uncomplicated malaria while Sulphadoxine-pyrimethamine (SP) is recommended only for intermittent preventive treatment during pregnancy (IPTp). Despite the change of the policy, SP is still being dispensed by private medicine outlets for treatment of uncomplicated malaria. Assessing dispensing practice of medicines dispenser's is therefore crucial.

Materials and Methods: The study was a descriptive cross-sectional study; simulated clients were used to capture quantitative data while qualitative data were captured using focus group discussion. The study population was private medicine outlets i.e Pharmacies and Accredited Drug Dispensing Outlets (ADDOs) located in Nyamagana and Sengerema District. For quantitative data the whole study had 65 outlets which constituted of 33 ADDOs and 32 Pharmacies while for qualitative data the study constituted 20 dispensers. The coded quantitative data were analyzed using Statistical Package for Social Sciences (Version 20.0) computer analysis software. Practice of dispensers was analyzed using cross-tabulation, chi-square and Fisher's exact test. Qualitative data were manually analyzed using content analysis.

Results: During malaria patient simulation 9.7 % of outlets dispensed ALU to simulated client while 85.5% dispensed SP. Results show that 90.6% of Pharmacies and 80% of ADDOs dispensed SP to simulated client even though SP is reserved for IPTp.

Conclusion: The study concluded that SP is still dispensed for uncomplicated malaria treatment rather than being reserved for IPTp where patient demand for a single dose medicine is one of driving factor for irrational dispensing and use of SP.

Keywords: ACT Policy, ALU, Dispensing practice, Private medicine outlets, SP, Mwanza.

in the prior 14 days, 41% sought care at a pharmacy and drug shop, whereas only 19% went to a government health facility.² A review of studies from some countries found that around half of caregivers initially sought medicines for the treatment of common childhood illnesses from private drug sellers.³

In the year 2005 Tanzania changed its malaria treatment policy for uncomplicated malaria from (SP) to artemisinin-based combination therapy (ACT) – specifically artemether-lumefantrine (ALU).⁴ SP remains the medicine of choice for IPTp. It is particularly important that medicines used in pregnancy are known to be safe.⁵

The study done by Menendez in 2010 revealed that, there was reductions in neonatal mortality by up to 61.3% have been reported following IPTp administration.⁶ The study done by Ramharter in Gabon revealed that; after introduction of IPTp, there was a marked benefit on the prevalence of low birth weight and premature birth for women adhering to national recommendations.⁷

Adherence to ACT policy is important in ensuring malaria treatment efficacy, as well as to reduce the likelihood of malaria parasite resistance to ACT.⁸ In order to preserve SP efficacy for IPTp, all possible efforts should be made to avoid SP use for the treatment of clinical cases of malaria.⁹ Therefore this study intended to examine practices of private medicines outlets in dispensing of ALU for treatment of uncomplicated malaria and to identify the extent at which

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INTRODUCTION

Malaria is a life-threatening blood disease caused by a parasite that is transmitted to humans by the *Anopheles* mosquito. Malaria is one of the leading causes of death in children under five years of age and accounts for up to 40% of outpatient visits in Tanzania.¹ A household survey in three regions in Tanzania, found that of those who sought care for fever

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SP is dispensed in treatment of uncomplicated malaria. The study involved over the counter malaria treatment only and not prescriptions.

MATERIAL AND METHODS

Study area and population

This study was a descriptive cross sectional study design which intended to capture qualitative and quantitative data; it was conducted in Mwanza region, which was conveniently selected as study site because it is highly populated and has high prevalence of malaria. The study population was medicine outlets i.e Private Pharmacies and ADDOs located in Nyamagana and Sengerema District. This study was conducted between October 2014 and May 2015.

Sample size and Sampling technique

For quantitative data the whole study had 65 medicines outlets which constituted of 33 ADDOs and 32 Pharmacies. The sample size was calculated using formula for calculating sample size for single proportion of the finite population.¹⁰ For qualitative data the study constituted 20 dispensers. There are 45 pharmacies and 19 ADDOs in Nyamagana district while Sengerema has 2 pharmacies and 31 ADDOs. Therefore sampling unit constitutes of 47 Pharmacies and 50 ADDOs. That makes the total of 97 medicine outlets.

The selection of medicine outlets was based on random sampling process. One dispenser was involved per outlet. Purposive sampling was employed on the focus group discussion.

Data collection

The principal researcher collected qualitative data using focus group discussion while quantitative data were collected by two simulated clients as research assistants. The focus group discussion was conducted in four sessions of five participants in each group.

The simulated client form was used by two simulated clients who acted as if they had symptoms of uncomplicated malaria and seek over the counter treatment. The form was used to record medicines advised by dispensers and medicines which were dispensed after client demand for SP. Ethical clearance was sought from the Ethical Review Committee of Muhimbili University of Health and Allied Sciences (MUHAS). To protect dispensers' privacy, no names of staffs were recorded and names of outlets are not mentioned in connection with the study's results.

STATISTICAL ANALYSIS

All the collected data were counter-checked for their reliability and validity. The coded data were analyzed using Statistical Package for Social Sciences (Version 20.0) computer analysis software. A *P*-value of less than 0.05 was considered as statistically significance, at 95% confidence interval.

For qualitative data, information obtained was transcribed and translated immediately to obtain meaningful information. The analysis was done manually using a content analysis approach.

RESULTS

Results from simulated clients

Out of 65 medicines outlets, only 62 (95.4%) outlets participated in simulation, which involved 32 pharmacies and 30 ADDOs. Three ADDOs did not agree to dispense anti malarial without laboratory test results. After simulated clients explained their malaria symptoms, dispensers advised various antimalarials; results revealed that most of dispensers of private medicine outlets; 40.3% advised the use of ALU and few of them; 5% only advised the use of sulfamethoxypyrazine/pyrimethamine (SPP), (Figure 1).

Results showed that there is relationship between type of the medicine outlet and the antimalarial advised by the dispenser, ($\chi^2=11.544$; *P* value =0.003). Most of ADDO dispenser's i.e 56.7% advised the use of ALU while most of pharmacy dispenser's i.e 30.7% of dispenser's advised the use of Dihydroartemisinin Piperazine (DPQ), (Figure 2).

Out of all 62 outlets; 11 outlets advised simulated clients to use SP while other 51 outlets advised simulated clients' medicine other than SP. Thus simulated clients requested those 51 outlets to give them SP since it is single dose medicine, some dispensers agreed while others disagreed. Results

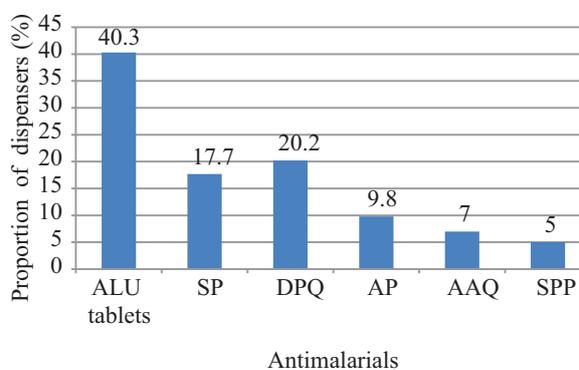


Figure-1: Medicines advised by dispensers to simulated clients in all medicine outlets (n=62)

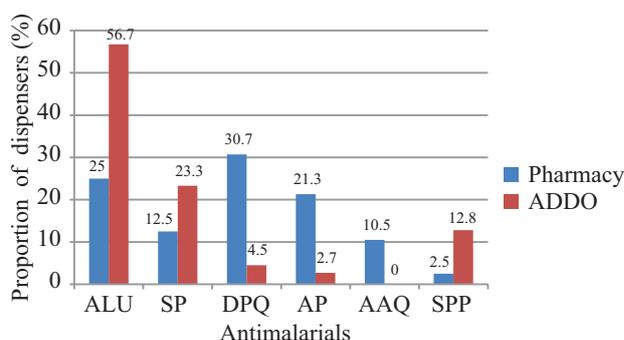


Figure-2: Medicines advised by dispensers to simulated clients, in Pharmacies (n=32), ADDOs (n=30)

Type of outlet	Dispenser's responses		Total
	Agree	Disagree	
Pharmacy	25(89.3%)	3(10.7%)	28(100%)
ADDO	18(78.3%)	5(21.7%)	23(100%)
Total	43(84.3%)	8(15.7%)	51(100%)

Table-1: Dispenser's responses after simulated clients demand for SP (n=51)

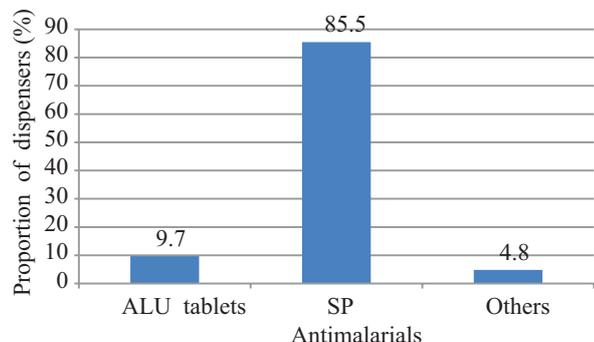


Figure-3: Medicines dispensed to simulated clients in all medicine outlets (n=62)

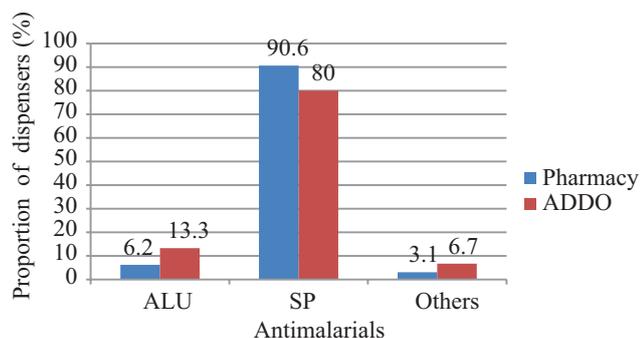


Figure-4: Medicines dispensed to simulated clients, in Pharmacies (n=32), ADDOs (30)

showed that after simulated clients demanded for SP in 51 outlets which initially advised other antimalarials; only 8 outlets (15.7%), (Table 1) disagreed to dispense it, reasons being SP was out of stock or it is reserved for IPTp. There is no relation between type of medicine outlet and dispenser's response, *P* Value =0.44.

Following dispenser's advice and simulated client's demand for SP, various antimalarials were finally dispensed; Study revealed that only 9.7 % of medicine dispenser's, dispensed ALU to simulated client. Most of medicine dispenser's i.e 85.5% dispensed SP while only 4.8% advised the use of other medicines which were DPQ, SPP and Artemisinin/ Piper- aquine (AP), (Figure 3).

Results show that, most medicine dispensers from both Pharmacies and ADDOs i.e 90.6% of pharmacies and 80% of ADDOs dispensed SP to simulated client even though SP is reserved for IPTp. There is the no relationship between type of the medicine outlet and the medicine dispensed to simulated clients. *P* value= 0.47, (Figure 4).

Simulated clients reported price of medicines, revealed that SP and SPP were cheapest medicine with price ranging from

Tsh1000/= to 1500/=, ALU and Artesunate/ Amodiaquine (AAQ) tablets ranged from Tsh2500/= to 3000/= while DPQ and AP were ranging between Tsh10, 000/= to 12,000/=.

Results from focus group discussion

On general overview in private medicine outlets, SP is mainly dispensed for treatment of uncomplicated malaria than IPTp. When medicines dispenser's asked, why they still dispense SP for the treatment of uncomplicated malaria even though it is prohibited, they had various responses such as; lack of knowledge to dispensers, inadequate training, lack of awareness to the community that SP is reserved for IPTp only, low cost of SP compared to ALU and other available antimalarial, patient demand for single dose medicine, complicated dosing schedule of ALU and clients belief that they can only be treated by SP. One of them said:

"We dispense SP for treatment of malaria due to various reasons such as; poor adherence to ALU as it has a lot of tablets; ALU has high cost and is more needful e.g patients have to eat fat food before taking ALU. If the patient has only 1000tsh you can't give him/her ALU which is more than 2000Tsh." (Participant 9)-Pharmacy.

Private medicine outlets face the following challenges when they advise clients to use ALU for those who ask for over the counter treatment of uncomplicated malaria: (1) Some clients complains that ALU has high price, many tablets and complicated dosing schedule so they need single dose medicine. (2) There are clients who believe they can be treated with SP only, for them there is no other medicine which is better than SP. (3) Other clients says that ALU always fails to treat them, others says it gives them they get side effects once they use it. (4) Some clients believe ALU has low quality/ substandard as there are lot brands of ALU, they believe ALU with leaf symbol is the best than those which are currently available.

One of respondents said: *"there are clients who believe they can be treated with SP only, for them there is no other medicine which is better than SP. There are clients who create habit of using sp for treatment of uncomplicated malaria, they say when they take SP it takes them only one day to be cured"*. (Respondent 2)- Pharmacy.

Another respondent said; *"Most of our clients do not prefer to use ALU because of its high price, they can't afford to buy one dose of ALU for Tsh2500/= -3000/=, some adult clients request to buy half course or even 4 tablets only"*. (Respondent 7)- ADDO

When asked which anti malarial medicine they prefer to dispense to the client for the over the counter treatment of malaria all of them said ALU. However SP is mainly dispensed for treatment of uncomplicated malaria than IPTp. Reasons given for the SP to be still dispensed by private facilities for the treatment of uncomplicated malaria even though it is prohibited, included; SP still treat some patients, failure of ALU, clients like to use medicine which are used to, single dose and few number of tablets, SP is cheap compared to ALU,

poor adherence to ALU, patient choice, lack of awareness to the community that SP is reserved for IPTp only. One of respondents said:

“Clients complain are not treated by ALU but treated by SP; also many clients prefer medicine with few tablets.” (Participant 10)–ADDO.

Another respondent said; *“I prefer to advise my clients to use ALU and if client don't prefer ALU because it have many tablets, I will give him/her medicine of his/her choice.”* (Participant 8)-Pharmacy.

DISCUSSION

Private medicines outlets are important source for treatment of uncomplicated malaria, including dispensing of antimalarials for self medication. ALU is the recommended first line antimalarial for treatment of uncomplicated malaria while SP is reserved for IPTp. Intermittent preventive treatment has recently been shown to be highly cost-effective for both prevention of maternal malaria and reduction of neonatal mortality in areas with moderate or high malaria transmission.¹¹ Despite the spread of SP resistance, IPTp continues to provide significant benefit, resulting in protection against both neonatal mortality (protective efficacy 18%) and low birth weight reduction by 21% under routine program conditions.¹²

In this study, proportion of dispensers in medicine outlets who dispense ALU, SP and other antimalarials for over the counter treatment of malaria were determined. Study results show that about 40% of all medicine outlets advised simulated clients to use ALU, but after simulated clients requested for SP since it is a single dose medicine, more than 80% of those who initially didn't advice on the use of SP agreed to dispense it. This entails that, without client pressure almost forty percent of private medicine outlets dispensers would dispense ALU to clients who seek over the counter treatment of malaria. All participants appeared in focus group discussion, know that ALU is the first line medicine for treatment of uncomplicated malaria, but only less than 10% dispensed it to simulated clients while about 85% dispensed SP. Difference in proportion between advised medicines and dispensed medicines were due to patient demand. However the percentage of anti malarial dispensed could have been different if availability of both ALU and SP could be 100%. In focus group discussion it was reported that dispensers grant the request of their customers; they reported client's choice as the factor of dispensing SP instead of ALU. There is relationship between type of the medicine outlet and anti malarial advised by dispensers. There is high chance for the patients to use ALU when she/he visit ADDO for self medication compared to when she/he go to the pharmacy. As it was revealed from this study, 56.7% of dispensers in ADDOs advised the use of ALU while almost 60% of dispensers in Pharmacies advised other antimalarials which were DPQ, AP, Artesunate/ Amodiaquine (AAQ) and SPP. High availa-

bility of other medicines with high price in Pharmacies than ADDOs is one of the contributing factors for the difference observed. However, there is no relationship between the type of the medicine outlet and antimalarial dispensed by dispensers with $P>0.05$, which indicate that both dispensers in Pharmacies and ADDOs are driven by patient demand which lead to irrational dispensing, this is supported by focus group discussion were dispensers from both pharmacies and ADDOs mentioned patient demand as factor for irrational dispensing. Other similar studies indicate similar results, e.g a study done in Kenya by Rusk in 2012 to determine if antimalarial drug knowledge predict antimalarial dispensing practice in drug outlets revealed that most of the medicine retailers surveyed (65%) were able to identify ALU as the Kenyan Ministry of Health recommended first-line anti-malarial therapy for uncomplicated malaria. However, the proportion of medicine retailers who recommended the correct treatment was low. Only 48% would recommend ALU to adults. It was discovered that customer demand has an influence on retailer behavior. Retailer training and education were found to be correlated with antimalarial drug knowledge, which in turn is correlated with dispensing practices.¹³

All participants in Focus group mentioned that, they prefer to advise their patients to use ALU. However the actual practice differs as per results from simulated clients. Even though the aim of SP to be allowed in private market is for IPTp refill, it was evident as it was mentioned by all participants that, SP is mainly dispensed for treatment of uncomplicated malaria instead of being reserved for IPTp. This will jeopardize its effectiveness in IPTp if the situation will remain the same. Dispensers had different opinions in effectiveness of ALU; even though most of them reported that, it is effective in treating Malaria with some cases of reported treatment failure. Hence they requested the MoHSW and other stakeholders to research on its effectiveness.

It was revealed from this study that, dispensers of private medicines outlets face the following challenges in ACT policy implementation; some clients are complaining that ALU has high price, cases of reported ALU failure, many tablets and complicated dosing schedule so they need single dose medicine. Other challenges being customers believe in SP to be the best medicine than ALU, clients demand and pressure. However the study done in Tanzania by Kabanyanyi; from patients perspective, show that upon proper pictorial instruction and making patient believe that ALU is effective in treatment of malaria 87.1% of patients found ALU easier to take and 87.7% believed that ALU was more effective than SP.¹⁴ As part of intervention Tanzania Food and Drug Authority (TFDA) has asked pharmaceutical manufactures to write the label on SP package which will indicate that is for IPTp only. Once those labeled batches enter into the market, other study could be done to compare the practice with what has been reported in this study. The limitation of this study is that, view of the National Drug Regulatory Authority was not sought in order to be able to clarify some of the issues such as reasons

for availability of SP in ADDOs and Pharmacies.

CONCLUSION

Results of this study indicate that less than half of dispensers in private medicine outlets would advise the use of ALU for treatment of uncomplicated malaria. However, SP is still dispensed for malaria treatment rather than being reserved for IPTp. Patient demand for a single dose medicine is one of driving factor for irrational dispensing and use of SP, other factors being affordability of SP and lack of awareness to the community that SP should be reserved for IPTp only. Intermittent preventive treatment of malaria during pregnancy is a key intervention in the national strategy for malaria control in Tanzania. Irrational dispensing of SP, which may result into SP developing resistance in IPTp and compromise the effort of the Ministry of Health and Social Welfare in reducing prevalence of malaria in pregnancy. Information to the community regarding proper use of SP and ALU should be disseminated through mass media. Tanzania Food and Drugs Authority (TFDA) should prohibit availability of SP to private medicine outlets and instead, it should be available in Private and public health facilities with Antenatal care clinics only.

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Gardening and Health: A Cross Sectional Study of Occupational Health Behaviour of Gardeners

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ABSTRACT

Introduction: Occupational safety and health (OSH) also commonly referred to as occupational health and safety (OHS) or workplace health and safety (WHS) is an area concerned with the safety, health and welfare of people engaged in work or employment. The goals of occupational safety and health programs include to foster a safe and healthy work environment. Working in Garden and field without taking appropriate protective measures will lead these workers several risk like Physical, biological and psychological hazards Hence the present study aims at studying socio demographic and health related behaviour of occupational gardeners.

Materials and Methods: The study group comprised 100 occupational gardeners of the Jabalpur city. A pretested proforma questionnaire was used to record the necessary information like medical history, sociodemographic factors, and findings of clinical investigations.

Result: Among the study subjects 33% were underweight with a mean BMI of 16.89 and further 11% persons were overweight with 26.78 mean BMI. Regarding personal protective behaviour during work only 17% gardeners uses cloth or mask to cover mouth while working, none of them bear apron, only 4% gardeners bear goggles and mask while spraying. Only 3% wear gloves while working and 59% wear shoes while working. The most common health problems are vision disturbance (25%), eye inflammation (16%), sneezing and running nose found in(11%), joint pain swelling and muscle stiffness16.%, and accidental injury (26%). Most rarely found health issue was varicose veins 2%.

Conclusion: Gardeners should be educated to use protective clothing, quit smoking and tobacco consumption, adopt proper body posture, and ensure vaccination.

Keywords: Body weight, BMI, blood pressure, community gardener, occupational disease

ly impact health. These workers often worked long hours. The prevalence rate of working more than 48 hours a week among workers employed in these industries was 37%, and 24% worked more than 60 hours a week. Of all workers in these industries, 85% frequently worked outdoors compared to 25% of all U.S. workers. Additionally, 53% were frequently exposed to vapors, gas, dust, or fumes, compared to 25% of all U.S. workers.⁴ Without appropriate protective measures Gardening may be associated with lots of injuries. the Consumer Product Safety Commission (CPSC) reports that gardeners suffer thousands of injuries every year. In 2012, for example, the CPSC estimates there were more than 100,000 injuries related to garden equipment or accessories in the United States.⁵ Although no such reports available for India due to lack of studies Lack of o health information in many sub-populations like gardeners in India, required to explore health behaviour of this perticular group of population. Working in Garden and field without taking appropriate protective measures will lead these workers several risk like Physical, biological and psychological hazards Hence the present study aims at studying socio demographic and health related behaviour of occupational gardeners.

MATERIALS AND METHODS

The study was conducted on 100 gardeners randomly selected from work place from different nurseries and garden during between July to September 2014. Sample of 100 purposefully selected for study convenience. Nurseries of all the four directions east west north south were covered to complete the sample of 100. Data were collected by person-to-person visits. They were assured of the confidentiality of the data and their informed consent was obtained. Sociodemographic information like age, sex, educational level, occupation status, and behavioral characteristics like use of tobacco, bidi, and alcohol were collected using a predesigned and pretest-

INTRODUCTION

World Health Organization defined "occupational health deals with all aspects of health and safety in the workplace and has a strong focus on primary prevention of hazards."^{1,2} Health has been defined as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."³ The 2010 NHIS-OHS found elevated prevalence rates of several occupational exposures in the agriculture, forestry, and fishing sector which may negative-

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ed questionnaire. Health status was assessed by conducting appropriate anthropometrical, history and examination of each subject following standard clinical methods. All the available personal medical records including investigation report and medication held by the persons were evaluated and were recorded. During personal interviews, the subjects were asked specific questions regarding the use of personal protective devices like shoes, gloves, goggles, face masks, etc. Similarly, they were asked whether the employer organized any health education session or were given any personal advice regarding the use of personal protective devices and quitting habits such as smoking and tobacco chewing.

STATISTICAL ANALYSIS

The results were expressed in terms of mean \pm SEM. Experimental data were entered analysed in MS excel.

RESULTS

A total of 100 gardeners with the age ranging from 11 to 65 years were surveyed during in three month duration between July to September 2014. Most of the population 87% belongs to 20- 50 yrs of age group, only 5 gardener were of age 51-60 yrs and 3 were of 61 to 70 yrs of age. 74 % gardeners were males. Table 1

Among the study subjects 33% were underweight with a mean BMI of 16.89 and further 11% persons were overweight with 26.78 mean BMI. table 2. High blood pressure was found in 15% subjects with systolic BP 140 and above and diastolic BP 90 and above. and 15 were diabetics found on the basis of history and clinical reports. table 3. All the subjects were surveyed for their general health status and be-

Age distribution in years	No (%)
11-20	5(5%)
21-30	30(30%)
31-40	34(34%)
41-50	23(23%)
51-60	5(5%)
61-70	3(3%)
Total	100(100%)
Sex Distribution	
Male	74(74%)
Female	26(26%)
Total	100(100%)

Table-1: Socio-demographic profile of study subjects

According to BMI: Category	No (Percentage)
Normal	56(56%)
Underweight	33(33%)
Overweight	11(11%)
BMI: Body Mass index (Underweight, 16.5-18.5, normal 18.5—25, overweight 25-30).	

Table-2: Distribution of study subjects according to body weight

havioral characteristics concerning different organ systems as depicted in Table 3

Most common physical hazard was overworking 53% followed by feeling of fatigue 45%. In our study 51% suffered minor cuts during gardening with 78 % of them site effected was hands. Regarding personal protective behaviour during work only 17% gardeners uses cloth or mask to cover mouth while working, none of them bear apron, only 4% gardeners bear goggles and mask while spraying. Only 3% wear gloves while working and 59% wear shoes while working. None of the gardeners bore apron during work. Smoking behaviour

Health related problems and working behaviour	No (%)
1. Physical complains	
Fatigue	45(45%)
headach	17(17%)
body ache	25(25%)
Poor sleep	39(39%)
Overworked	53(53%)
2. Work related injury:-	
Minor cuts from routine weapon	51(51%)
Insect bite	17(17%)
Snake bite	1(1%)
Accidental injuries during work	23(26%)
Vericose veins	2(2%)
3. Respiratory problems	
Respiratory allergies	30(30%)
Asthma	3(3%)
Cough and cold Running nose	11(11%)
4. Ocular problems	
Watering of eyes	7(7%)
Diminished vision	25(25%)
Any Ocular inflammation(conjunctiviites an,keratiis,,sty)	16(16%)
5. Skin problems	
Contact dermatis	32(32%)
Skin infection mostly fungal and bacteria	39(39%)
Worm penetration through abraded skin	2(2%)
6. Chronic disease	
Diabetes	15(15%)
Hypertention	23(23%)
7. Personal habbits	
Alcoholism	21(21%)
Smoking	39(39%)
Tobbaco chewing	28(28%)
8. Joint pain and muscels stiffness	
Arthritis	16(16%)
Back pain	34(34%)
9. Personal protective behavior atworking place	
Wear shoes while working.	59(59%)
Aprons	0(0%)
Gloves	3(3%)
Clothes / mask to cover mouth	17(17%)
Use of mask and googles while spraying pesticide.	4(4%)

Table-3: Distribution of study subjects according to their health status and behavioral characteristics

was found in 39 % subjects and alcohol consumption in 21%. The most common health problems are vision disturbance (25%), eye inflammation (16%), sneezing and running nose found in(11%), joint pain swelling and muscle stiffness16.%, and accidental injury (26%). Most rarely found health issue was varicose veins 2%.

DISCUSSION

Most of gardeners in our study (83%) were literate educated primary and above and only 17 % were illiterate. The study populations of gardeners were mostly literate.67% gardeners were fulltime gardeners and 33% were irregular workers do part time other works also, despite this their main occupation was gardening only. They resided in overcrowded and unhygienic conditions of the slum areas, making them susceptible to vulnerable diseases. Most of study population belongs to lower socioeconomic class. Among the study subjects 33% were underweight with a mean BMI of 16.89 and further 11% persons were overweight with 26.78 mean BMI. Body mass index (BMI): weight in kg/height in metres value less than 18.5 was considered as thinness or chronic energy deficiency and BMI more than 25 was considered as overweight.⁶⁻⁷

Hypertension was defined as SBP 140 mmHg and/or DBP 90 mm Hg and/or treatment with antihypertensive drugs.⁸ High blood pressure was found in 15% subjects with systolic BP 140 and above and diastolic BP 90 above.which was lower than general population. Gardening has been shown to be a relaxing active activity that can significantly lower blood pressure in people with hypertension and prehypertension According to the Centers for Disease Control and Prevention (CDC), moderate-intensity level activity for 2.5 hours each week can reduce the risk for obesity, high blood pressure.⁸

In a Sentinel Surveillance Project, documented 28% overall prevalence of hypertension (criteria: =JNC VI) from 10 regions of the country in the age group 20-69. Another study carried out in 1998 among Industrial population in the Bharat Electronics Limited (BEL), India using the same criteria illustrated a prevalence of 30% among men.⁹⁻¹¹

In our study 15% were diabetic found on the basis of history and clinical reports Which was found higher than general population. The hectic work schedules of occupational gardeners and unregulated diet may be the responsible factors. During 1972-75, ICMR carried out a large multicentric study in India, which documented 2.6% and 1.5% prevalence of diabetes (criteria:FBS>5.6mmol/l or Post 1-h glucose value>=7.8mmol/l or Post 2-h glucose value>=6.7mmol/l) among men and women in the urban areas while in rural areas had a lower prevalence: 1.8% and 1.3%.⁹

Smoking behaviour was found in 39 % subjects and alcohol consumption in 21% and tobacco consumption 27%. National Sample Survey Organization (NSSO) note on consumption of tobacco in India in Madhya Pradesh depicted 33.6 %urban male and 7.2 % urban female are tobacco consumers.¹⁰ State-level prevalence of tobacco smoking in India in

Madhya Pradesh found 29.4% in urban males 0.9% in urban females.¹³

In our study 51% suffered minor cuts during gardening with 78 % of them site effected was hands. Only 68 % of those having injury with rusted weapon followed primary medical treatment and TT vaccination, rest of the population just washed it and tied a wet cloth over it. These data reveals ignorant behaviour of gardeners regarding self health and minor cuts a and wounds. Most of gardeners using garden tools, those with sharp edges or pointed tips. Make them prone for cuts on hands and fingers. Several time these cut goes unnoticed.

In our study 59% wear shoes while working, working with working ware foot make them prone for soil contamination, worm penetration, also spraying and handling various kind of pesticides and insecticide make them prone for chemical hazards, respiratory allergies ocular inflammation and irritation. In our study vision disturbance was found in (25%), eye inflammation (16%), sneezing and running nose found in(11%).Small organisms in the soil can enter the body through lesions and lead to infection. Buried objects such as metal or glass can also cause puncture wounds and carry a risk of tetanus. In our study 17%, insect bites, one case of snake bite was found as most of gardener took place in open and outdoor making them prone for insect bite ants, scorpions, and a host of flying insects can have irritating bites or cause allergic reactions in some peoples.

In this study, joint pain swelling and muscle stiffness16.%, The gardeners have to work in different postures continuously for long durations which results in joints pain, swelling, muscle stiffness, and back pain. The percentage of accidental injury was found to be 28%. This can be reduced by proper training. Most gardening tools are old-fashioned and need more physical labor to operate

The most common health problems are vision disturbance (25%), eye inflammation (16%), The gardeners are exposed to intense sunlight, chemicals, and pesticides which cause inflammation and irritation in eyes. Long-term exposure to sunlight especially ultraviolet (UV) rays and chronic eye irritation from dry dusty conditions seem to play an important role.¹⁴

CONCLUSION

So on the basis of study we recommend the following action should be taken at personal as well as public label for all gardening population to assure positive health benefits and promote safe gardening practices.

Gardeners should be educated regarding proper use of safety goggles, sturdy shoes or high rubber boots, and long pants when using lawn mowers, and other machinery.

The gardeners should be motivated to wear gloves, long sleeves, and sunshades to lower risk of skin irritation, sunburn, and skin cancer.

Instructions and warning labels on chemical, lawn and gar-

den equipment should be followed carefully.

Tetanus lives in the soil and enters the body through cuts in the skin. Because gardeners use sharp tools, dig in the dirt and handle plants with sharp points, they are particularly prone to tetanus infections. Ensure tetanus/diphtheria vaccination.

Despite the fact study was carried in limited number of subjects, the study revealed several important facts regarding working behaviour of gardeners but still it is recommended at a broader scale to give more promising result and will definitely help to improve gardeners health and promote safe gardening practices.

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PapillonLefevre Syndrome: Report of a Case Successfully Treated with Acitretin

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ABSTRACT

Introduction: Papillon-Lefevre syndrome (PLS) is a rare syndrome of autosomal recessive inheritance characterized by palmoplantar hyperkeratosis and early onset of a severe destructive periodontitis, leading to premature loss of both primary and permanent dentitions. The etiopathogenesis includes a genetic basis for susceptibility to specific virulent pathogens but a recent report has suggested that the condition is linked to mutations of the cathepsin C gene. Effective treatment includes extraction of primary teeth, systemic Acitretin, and antibiotics along with topical keratolytics and professional teeth cleaning.

Case report: This paper presents our experience with acitretin therapy in a case of PLS, who had an excellent response in palmoplantar skin lesions within four weeks.

Conclusion: As dentists play a significant role in diagnosis and management of PLS, this case report is an effort to create awareness among the dental fraternity.

Keywords: Papillon-Lefevre syndrome, palmoplantar hyperkeratosis, Acitretin

INTRODUCTION

In 1924, Papillon and Lefevre described a brother and sister with a condition characterized by palmoplantar hyperkeratosis (keratoderma) associated with severe, early onset periodontitis and premature loss of primary and permanent teeth. Gorlin et al added calcification of the falx cerebri to the syndrome, converting it into a triad. Variable findings in the syndrome include retardation of somatic development, follicular hyperkeratosis, nail dystrophy, and hyperhidrosis.^{1,2}

The prevalence of PLS is 1-4 per million individuals with no sex predilection and no racial predominance. A genetic predisposition, with greater frequency of occurrence in offsprings of parents with consanguinity, has been reported.³ In addition to genetic alterations, several environmental and host factors are involved in the PLS periodontitis including (a) specific virulent bacterial and viral infection of periodontium, particularly *Actinobacillus actinomycetemcomitans*, cytomegalovirus, and Epstein-Barr type 1 virus; (b) impaired neutrophil chemotaxis, migration, and phagocytotoxic functions, and increased superoxide production (c) reduced functional activity of monocytes elicited by decreased phagocytosis, increased tendency to aggregate, and impaired Fc-receptor function; (d) decreased mitogenic activity of

lymphocytes, and reversed ratio of T-helper to T-killer cells (e) degenerative changes of plasma cells and elevation of serum immunoglobulin (IgG) and (f) disrupted functioning of fibroblast and cementoblast along with defective periodontal ligament attachment and gingival epithelium leading to imbalanced collagenolytic activity in the periodontal ligament. Accumulated etiopathogenesis suggests that PLS is a complex interaction between immune-mediated deficiencies in the host defense mechanism and inherited genetic defects.^{4,5} An increased susceptibility to infection has been reported in approximately 25% of Papillon-Lefevre patients.¹

CASE REPORT

A fourteen year old girl reported to the outpatient department complaining of loose teeth and difficulty in chewing. [Fig.1] Patients also complained of peeling of the skin of the hands and feet. On further conversation, patient told that her parents were first cousins and had consanguineous marriage. Parents and other members of the family were not affected. On general examination, the patient had overall normal physical and mental development. Extra oral examination demonstrated keratoderma on the palmo plantar aspects of hands, feet, lateral aspect of the legs, knees and elbows. On intraoral examination the patient had permanent dentition with gingival inflammation, deep periodontal pockets along with mobility affecting all the teeth. [Fig.1] Orthopantomogram revealed generalized destruction of alveolar bone while lateral skull projections did not reveal any calcific areas within the skull. [Fig.1] Baseline investigations like complete blood count, liver function tests, electrolytes, fasting cholesterol and triglycerides were within normal limits.

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Thus the patient was diagnosed to be suffering from Papillon Lefevre Syndrome. Treatment consisted of oral Acitretin 10mg per day, Cotrimoxazole (200:40) and topical keratolytics which included 6% coal tar, sulphur and salicyclic acid (salytar). Initially the patient was put on Acitretin 10mg once daily for two days of every three for 8 weeks and then every alternate day for next 8 weeks and then once in three days for another 8 weeks. Within 4 weeks, marked regression of the palmoplantar keratoderma was seen. (Fig.2,3,4) Periodontal health also improved considerably. The patient was followed on the same maintenance dose for next six months and reviewed monthly. The baseline investigations were repeated every 6 months. At one year follow up visit we noticed almost healthy skin though there was history of exacerbations during the winters.

DISCUSSION

Papillon Lefèvre syndrome is called so because it was described by Papillon and Lefèvre in 1924. The hallmark of this syndrome is diffuse palmoplantar hyperkeratosis and juvenile periodontitis. Initial manifestations are noticed during first decade of life in the form of hyperkeratosis seen over soles and dorsal surface of the hands and feet. Erythematous hyperkeratotic plaques may also be present at the elbows, knees, and trunk. Severe periodontitis affecting both primary and permanent dentition in 3- 4year old young children is seen.³ In PLS, there is eruption of primary teeth in the normal sequence, with the teeth being of normal form and structure. No delay in eruption timings is seen. Severe gingival inflammation and generalized aggressive periodontitis leading to tooth mobility has been reported with erupting dentition. As a result of which primary teeth are exfoliate by the age 4 or 5 years. After exfoliation of the primary dentition the gingival inflammation resolves only to revert back in same sequence with eruption of permanent teeth. Thus, permanent dentition is lost by 15-17 years of age. Severe resorption of alveolar bone gives the teeth characteristic ‘floating-in-air’ appear-

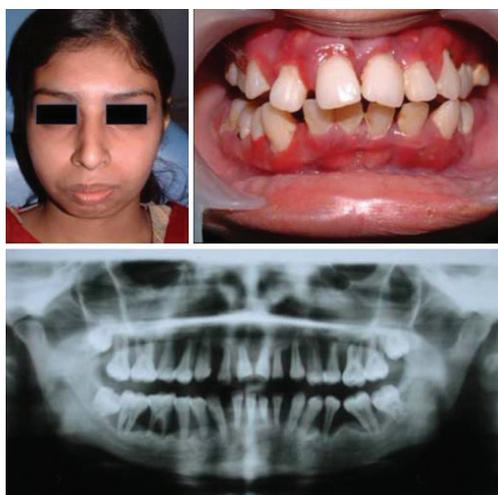


Figure-1: Extra Oral profile, Intraoral Photograph showing severe periodontitis and OPG showing generalized bone loss.

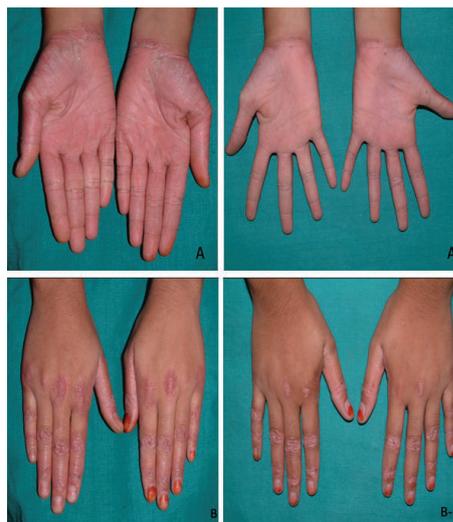


Figure-2: A, A: Pre and post treatment photograph of palmar aspect of both hands. B, B: Pre and post treatment photograph of both hands (front view)



Figure-3: C, C: re and post treatment photograph of medial surface of right leg. D, D: Pre and post treatment photograph of medial surface of left leg.



Figure-4: E, E: Pre and post treatment photograph of plantar aspect of both legs. F, F: Pre and post treatment photograph of both legs (front view)

ance on dental radiographs. Palmoplantar keratosis may be in the form of mild psoriasiform scaly skin to hyperkeratosis involving skin of entire hands, feet, elbows and knees.^{2,6}

Especially in winter, palmoplantar hyperkeratosis worsens with painful fissures, similar to our case, thereby limiting routine activities and necessitating systemic treatment.⁷ The etiology of PLS is debatable, but most widely accepted hypothesis states it to be due to mutations in one or both the alleles of cathepsin c gene which results in loss of function. Cathepsin c gene, located on chromosome 11q14.1-q14.3 is expressed in palms, soles, knees, and keratinized oral gingiva. All these regions are commonly affected by PLS It is also expressed at high levels in various immune cells including polymorphonuclear leukocytes, macrophages, and their precursors. It encodes a cysteine-lysosomal protease also known as *dipeptidyl-peptidase I* which functions to remove dipeptides from the amino terminus of the protein substrate. It also has endopeptidase activity. Mutations in cathepsin c gene result in PLS syndrome, haim-munk syndrome, and prepubertal periodontitis. Severe early-onset periodontitis in all of these three conditions.^{8,9}

Haim munk syndrome is the most closely mimicking entity which is defined by tapered, pointed phalangeal ends, claw like volar curves, pes planus and arachnodactyly.^{6,10,11} But none of these were seen in our case. Conditions like acrodynia, hypophosphatasia, histiocytosis X, leukemia, cyclic neutropenia, Takahara's syndrome are associated with periodontitis and premature loss of teeth but no palmoplantar hyperkeratosis. Other group of closely resembling conditions Unna Thost, mal de Meleda, Howel-Evans syndrome, keratosis punctata, keratoderma hereditarium mutilans (Vohwinkel's syndrome), and Greither's syndrome but these entities are not associated with periodontopathy.¹ Histopathological findings of affected skin have not been well described in the literature. Reported histopathological findings include hyperkeratosis or parakeratosis, acanthosis, and slight perivascular inflammatory infiltrate.^{5,11} A multidisciplinary approach is essential for the effective management of patients with PLS. Keratolytics are the drug of choice for skin manifestations in PLS. Salicylic acid, coal tar and sulphur may be added to the regimen as adjuncts. Oral retinoids including acitretin, etretinate, and isotretinoin are helpful to treat both the keratoderma and periodontitis associated with PLS.¹² For obvious reasons, the outcome of treatment is better if initiated during the eruption and maintained during the development of the permanent teeth. Effective periodontal management includes antibiotics, thorough oral prophylaxis and extraction of the primary teeth. Role of etretinate and acitretin lies in preserving the teeth by modulating the course of periodontitis. Antibiotics are prescribed to control the active periodontitis so as to prevent spread of bacteria in blood which might cause pyogenic liver abscess.^{5,13}

CONCLUSION

To conclude, we have tried to create awareness among med-

ical fraternity about a not-so-common disease which has a negative psychological impact of lives of young children. Early dental evaluation and parental counselling as a part of preventive treatment is essential for providing complete psychosocial rehabilitation for PLS patients.

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Triple Malignancy Involving Breast, Ovary and Uterine Vault: A Case Report and Literature Review

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ABSTRACT

Introduction: The occurrence of two or more primary malignant neoplasms in the same person is rare. We have a case report of a 45-year-old woman with triple malignancy involving breast, ovary and uterine vault being managed at our center since 5 years.

Case Report: Our patient presented as a post operated case of two primary malignant neoplasms of carcinoma breast and ovary. For carcinoma ovary she underwent adjuvant chemotherapy and interval cytoreductive surgery. For carcinoma breast she received adjuvant locoregional radiotherapy and chemotherapy. After latent period of 42 months, patient was diagnosed with squamous cell carcinoma vault for which she received pelvic radiotherapy. After around one year she developed locoregional recurrence of vault carcinoma. She received six cycles of palliative chemotherapy and is on regular follow-up. Our patient presented with two synchronous primary malignancies and one metachronous malignancy. Two primary malignancies were carcinoma ovary and breast. She was diagnosed with the third malignancy (carcinoma uterine vault) when she was in regular follow-up and the two previous primaries were controlled. This emphasizes the importance of a regular follow-up and the need of a meticulous work-up for early diagnosis and prompt management of any metachronous malignancy.

Conclusion: Regular follow-up with suspicion of any metachronous primary malignancy and prompt diagnostic work-up to detect them at early stage is very crucial for better outcome. Moreover the choice of appropriate treatment strategy remains the cornerstone in management of patients with multiple primary malignancies.

Keywords: Multiple primary malignancies, infiltrating ductal carcinoma of breast, papillary serous cyst-adenocarcinoma of ovary, squamous cell carcinoma cervix.

synchronous in which all the malignancies occur at the same time or within six months of first malignancy (b) metachronous when the gap between second or high order malignancies and the previous one is at least six months.²

There are various but ill-defined risk factors for multiple primary malignancies, mainly including genetic predisposition, environmental factor and previous treatment history. Multiple primary tumors mainly involve respiratory, gastrointestinal and genitourinary tract.³ According to various studies their prevalence is in the range of 3-5% among which triple tumors occur in only 0.5% of cases.⁴ There is an increase in the incidence of MPM and one of the most important causes of this increasing trend is the gain in survival of cancer patients nowadays due to advances in diagnostic modalities, treatment and supportive care.⁵ According to one report, about sixteen percent cancer patients in their further lifetime develop second malignant neoplasm.⁶ There are several cases of MPM reported in literature. After thorough review of literature, it is concluded that this case report is the first one to describe three primary malignancies in a postmenopausal woman from India in which two malignancies involving breast and ovary are synchronous type and one involving uterine vault is metachronous type.

CASE REPORT

It is a case of a previously undescribed combination of co-existent triple primary malignant neoplasms. Each of the three lesions demonstrated the classical picture of a characteristic neoplasm of the structure involved, namely, infiltrating ductal carcinoma of breast, papillary serous cyst-adenocarcinoma of ovary and squamous cell carcinoma of uterine vault. No distant metastases to viscera were observed from

INTRODUCTION

Warren and Gates first described multiple primary malignancies (MPM) in the same individual. When two or more malignancies with no relationship between them occur in the same individual, it is defined as MPM. In 1932, Warren and Gates defined three criterias for diagnosing multiple primary cancers, namely: (1) The histopathology of each tumor must have component of malignancy, (2) They must have different histopathology, and (3) Any one of the tumor must not be metastasis of the other malignancy.¹ It is of two types (a)

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any of the tumors, despite the clear-cut microscopic picture of malignancy and gross local invasiveness. A 45-year-old Indian woman with triple primary malignancy of carcinoma of breast and ovary followed by carcinoma of uterine vault over last five years is managed successfully at our center. In her medical history, she had no personal or family history of cancer or management related to it. She is an unmarried lady with age of menarche at 15 years and surgical menopause at 40 years. Our patient never received hormone replacement therapy and oral contraceptive pills in her lifetime. She is a known hypertensive since ten years and is on antihypertensive drugs. In January 2010 patient presented to our OPD as post operated case of carcinoma breast and ovary for adjuvant treatment. She had history of breast lump and ovarian cyst for which she got operated outside in a private clinic. She had undergone modified radical mastectomy for breast lump and bilateral ovarian cystectomy for ovarian cyst. Histopathology of mastectomy specimen revealed infiltrating ductal carcinoma breast (5x4x4 cm) with margin positive and all 5 resected axillary nodes positive for malignancy (Fig. 1). Ovarian histopathology was papillary serous cyst-adenocarcinoma of bilateral ovaries with involvement of external surfaces (Fig. 2). Both the hormone receptors (estrogen and progesterone receptors) and her2 neu were negative. She was planned for adjuvant chemotherapy followed by adjuvant radiation to chest wall and regional lymph nodes. She received three cycles of paclitaxel (260mg) and carboplatin (450 mg) every 21 days. Any chemotherapy induced serious adverse events were not reported during and after completion of chemotherapy. Following this her serum CA 125 level was within normal limit (15 IU/ml) but her CECT abdomen showed well defined hypodense pelvic lesion invading adjacent bowel loops and rectum with metastatic deposits over bowel loops and uterine fibroid. In May 2010, she was planned for interval debulking surgery. She underwent laparotomy with total hysterectomy, omentectomy, all metastasectomy and lymph-node sampling. Histopathology revealed metastatic deposits on omentum, chronic cervicitis with all the resected nodes showing reactive changes. After this she received three more cycles of same chemotherapy. Then she was treated with irradiation to chest wall and regional lymph nodes. Her treatment was completed in September 2010. She was on regular follow up. During her follow up period she underwent thorough physical examination with regular monitoring of serum CA 125 level and radiological investigations as per requirement. In April 2012 she was admitted in gynecology ward for bleeding per vaginum and ultrasonography (USG) of abdomen revealed a 65 X 63 mm mass in uterine fossa with rich vascularity. All other organs were normal with no evidence of metastasis but her CA 125 level was raised to 1276 U/ml. She got symptomatic improvement following conservative treatment. She was again planned for chemotherapy and received 6 cycles of cyclophosphamide, adriamycin and cisplatin repeated every 21 days. After the completion of chemotherapy, radiologically the pelvic mass

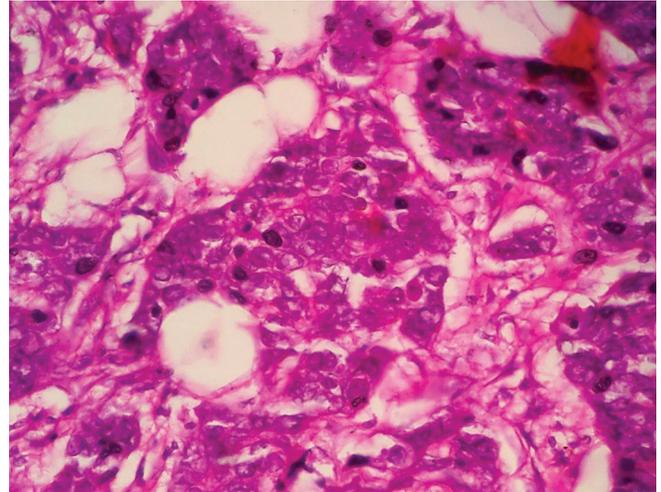


Figure-1: Histopathological features of infiltrated duct carcinoma of breast.

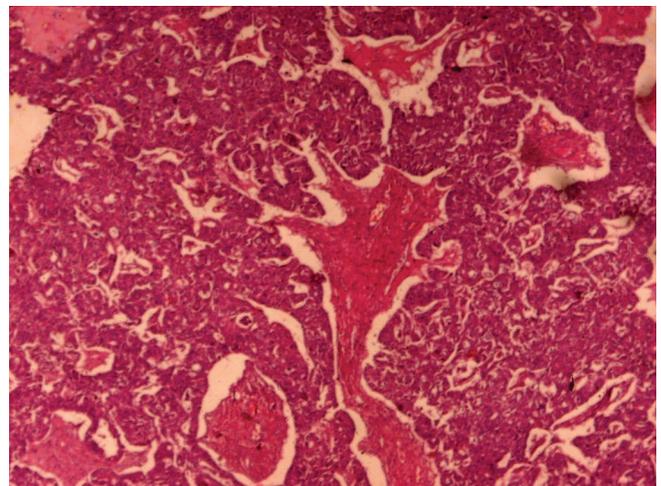


Figure-2: Histopathological features of serous papillary adenocarcinoma of ovary.

completely resolved and serum CA 125 level was within normal limit. In June 2013 she again presented with complains of bleeding per vaginum. Clinical examination revealed an ulceroproliferative growth involving uterine vault with induration of right sided parametrium short of pelvic wall. USG showed a heterogeneous hypoechoic mass in vaginal vault region. Vault biopsy was suggestive of squamous cell carcinoma (Fig.3). She received pelvic external beam radiotherapy (EBRT) dose of 50 Gray in 25 fractions along with concurrent weekly cisplatin based chemotherapy. It was followed by intravaginal brachytherapy dose of 3 fractions of 6.5 Gray each prescribed at vaginal mucosa. After radiotherapy there was complete response of vault growth with CA 125 level of 0.890 U/ml and USG abdomen showing normal scan. The patient was kept on regular follow up. In November 2014, she again had complain of whitish discharge per vaginum and on clinical examination there was recurrence of vault growth reaching upto introitus. Biopsy confirmed it as moderately differentiated squamous cell carcinoma. USG abdomen was suggestive of irregular mass in the pel-

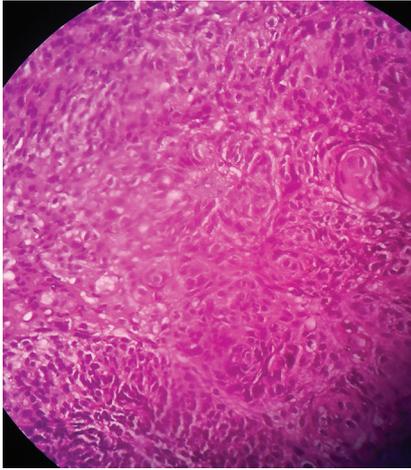


Figure-3: Histopathological features of squamous cell carcinoma of uterine vault.

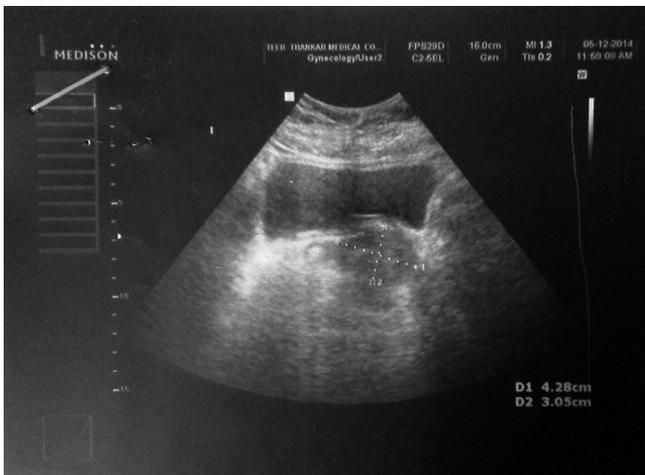


Figure-4: USG abdomen showing irregular mass in the pelvis posterior to the base of urinary bladder.

vis posterior to the base of urinary bladder (Fig. 4) and serum CA 125 level was 226.13 U/ml. She received six cycles of three weekly gemcitabine (1.4 gm) and carboplatin (450 mg) based chemotherapy. The pelvic disease responded to chemotherapy and the patient is kept on regular follow-up. Our patient tolerated all her treatment well with minimal side effects and without complications. In the last follow, all the three primary malignancies are well controlled with evidence of treatment related late toxicities. At present the patient is alive and disease free with no evidence of any recurrent or residual disease.

DISCUSSION

MPM are rare but now with increasing survival of cancer patients, the incidence of MPM is increasing. In 1879 Billroth, reporting the earliest recognized cases of true multiple malignancy, postulated that each tumor must have a different histologic appearance, must arise in a different location, and must produce its own metastases. Mercanton, in 1893, added that there must be no reappearance on removal. Warren and

Gates pointed out that there was no significant difference in the age of female patients with one, two, or three cancers, and that the average duration of life in patients with multiple cancers is less than a year longer than the two-year average for a single malignant growth. The opposing contention of Hanlon, however, that patients with multiple malignant growths are generally several years older than those dying with a single new growth, somewhat confuses the issue. There is 20% higher risk of new primary cancer in same or different organ of a cancer survivor in comparison with general population. These newly developed primary cancers can be due to previous therapy, some syndrome related or some common etiologic factors.⁷

The most common cases of MPM involve hematological, lung, thyroid, breast, skin and genitourinary systems.³ Because of embryological and hormonal factors, in MPM the most common organ to be involved is breast. The combined occurrence of carcinoma of breast and ovary is related to a familial carcinoma syndrome. In this case there are two primary synchronous malignancies namely carcinoma breast and ovary. There is no family history of any cancer in our patient. The patient is nulliparous and this is the only known risk factor for these malignancies. So it may be concluded that this case is an example of sporadic occurrence of these malignancies which may be described by environmental modifications and polygenic model.⁸ In a similar report, Soo-Kyung Noh described a case of four malignancies involving breast and rectum followed by ovary and endometrium.⁹

The third malignancy in this case is squamous cell carcinoma of the uterine vault. It fulfills the criteria of metachronous MPM as it occurred some time after the two synchronous varieties. This unusual occurrence of two synchronous MPMs namely, infiltrating duct carcinoma of breast and papillary serous cyst adenocarcinoma of ovary followed by one metachronous squamous cell carcinoma of the uterine vault, has not been reported among Indians. As the general condition of our patient was good, she underwent three surgical procedures, received 18 cycles of chemotherapy and two times irradiated at two different sites. But the choice of treatment and their sequencing was difficult task. Challenges faced in management of this case were due to differential diagnosis and diagnosis of onset of new malignant lesion with different histopathology. Through aggressive and systematic diagnostic approach, a clinician may resolve these problems. There are no standard recommendations and guidelines for management of MPM. The management should be based on general condition of patients, the types of malignancies, proper sequencing of treatment modalities and response to therapy. Curative lesions should be treated with radical approach. All other lesions are approached with palliative intent. After management of first malignancy, risk of development of subsequent higher order malignant lesions must be kept in mind. During follow up period of a cancer survivor, a clinician should not only focus on diagnosis of any recurrent or metastatic lesion from first malignancy, but also keep in mind

the occurrence of any second or higher order malignancies at the same or different site. The preventive and interventional strategies should be targeted for this high risk population. Among the cases of MPM, there are only about 10 per cent cases of true triple malignancies, with reporting of approximately 135 cases only. With this background, it is felt that this case warrants recording in the literature.

CONCLUSION

Suspicion, awareness, appropriate and aggressive diagnostic work up is crucial for detection of MPM at early stage to have better outcome. For the management of multiple primary malignancies, choice of appropriate treatments and their sequencing remains the cornerstone. It is a general tendency that if a patient with known malignancy develops new symptoms, it is correlated with recurrence of the previous one. In the follow-up period after successful management of first malignancy, a clinician should always keep in mind the development of second or, higher order primary malignancy, for detection at early stage with better outcome.

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Acute Coronary Syndrome in an Adolescent with Homozygous Familial Hypercholesterolemia

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ABSTRACT

Introduction: Familial hypercholesterolemia is a single gene disorder with autosomal codominant pattern of inheritance. While heterozygous familial hypercholesterolemia is common, homozygous familial hypercholesterolemia is distinctly uncommon with a worldwide prevalence of 1 in 1 million persons.

Case report: Here we report a boy of 15 years of age, who had xanthomas, xanthelasmas and presented to us with acute coronary syndrome. His paternal uncle had died prematurely of coronary artery disease. The patient had very high level of LDL-C in blood. Coronary angiography revealed left main coronary artery stenosis with involvement of other coronaries.

Conclusion: Very few cases of familial hypercholesterolemia have been reported from India. This is more likely due to lack of awareness of the disease rather than due to its rarity. Early diagnosis and prompt treatment will help prevent life threatening complications like premature atherosclerosis.

Keywords: Familial Hypercholesterolemia, Xanthomas, Premature Atherosclerosis.

INTRODUCTION

Familial hypercholesterolemia (FH) is a genetic disorder characterized by elevated level of low density lipoprotein cholesterol (LDL-C), tendinous xanthomas and premature coronary atherosclerosis. It is an autosomal codominant disorder characterized by gene dose defect, in that the individuals with two mutant LDL receptor alleles (FH homozygotes) are much more affected than those with one mutant allele (FH heterozygotes).¹

FH is one of the commonest inherited disorders, with an estimated worldwide prevalence of 1 in 500 (heterozygotes).² The homozygous state is rare with a prevalence of one in million persons. These prevalences likely represent underestimates. The patients of FH are at high risk of developing coronary artery disease and sudden death, unless the condition is recognized and treated promptly. Here, we report a case of homozygous FH in an adolescent who presented with acute syndrome.

CASE REPORT

A fifteen year old boy, born of nonconsanguineous marriage, presented with severe chest pain of 5 days duration. The pain was typical of angina. The boy had 1 brother and 2 sisters.

None of the siblings suffered from coronary artery disease (CAD). The parents were also doing well. However, one paternal uncle had died of acute myocardial infarction at the age of 38 years.

Hemodynamically he was stable. Cutaneous examination revealed multiple and extensive tendinous xanthomas of varying size (1-10 cm), distributed over axilla, elbows, hands, knees and feet. (Fig.1-4).

Xanthelasmas were present around the eyelids and the eyes showed corneal arcus (Fig 3). Examination of dorsum of hands revealed characteristic involvement of interdigital spaces showing pathognomonic intertriginous xanthomas (Fig 2). The patient's parents had noticed xanthomas in the patient since 5 years of age. The ECG showed significant ST segment depression in anterior precordial leads with ST segment elevation in lead aVR. The troponin level was not elevated. A diagnosis of acute coronary syndrome was made. The echocardiographic examination was normal.

Routine laboratory parameters like Hb%, DC, TLC, blood sugar, serum urea, creatinine thyroid function tests and liver function tests were normal. Lipid profile of the patient demonstrated LDL-C to be very high with normal triglyceride level (Table 1). Lipid profile of the parents and siblings were done. Both the parents and 1 brother had very high serum LDL-C level. Coronary angiogram was done on the next day which revealed left main coronary artery stenosis and involvement of other coronary arteries as well. (Fig 5,6) A final diagnosis of familial hypercholesterolemia with acute coronary syndrome was made. The patient was immediately sent to cardiothoracic surgery department for coronary artery bypass surgery because of significant left main coronary artery involvement. In the meantime, he was put on high dose statin (Atorvastatin 80 mg/day) along with anti-ischemic agents. The diagnosis of familial hypercholesterolemia was made in this case as per the Dutch Lipid Clinic

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	Total cholesterol (mg/dl)	LDL –C (mg/dl)	TG (mg/dl)	HDL (mg/dl)
Patient	1080	923	168	40
Father	389	281	159	43
Mother	413	295	160	38
Brother	390	267	138	44
Eldest sister	197	106	145	45
Elder sister	401	308	156	37

Table 1: Lipid profile of the patient and the family members



Figure-1: Xanthomas over the elbows; **Figure-2:** Intertriginous xanthomas

Group 1: Family history	Points
(i) First-degree relative with known premature (<55 years, men; <60 years, women) coronary heart disease (CHD) OR	1
(ii) First-degree relative with known LDL cholesterol >95 th percentile by age and gender for country OR	1
(iii) First-degree relative with tendon xanthoma and/or corneal arcus OR	2
(iv) Child(ren) <18 years with LDL cholesterol >95 th percentile by age and gender for country	2
Group 2: clinical history	
(i) Subject has premature (<55 years, men; <60 years, women) CHD	2
(ii) Subject has premature (<55 years, men; <60 years, women) cerebral or peripheral vascular disease	1
Group 3: physical examination	
(i) Tendon xanthoma	6
(ii) Corneal arcus in a person, <45 years	4
Group 4: biochemical results (LDL cholesterol)	
>8.5 mmol/L (>325 mg/dL)	8
6.5–8.4 mmol/L (251–325 mg/dL)	5
5.0–6.4 mmol/L (191–250 mg/dL)	3
4.0–4.9 mmol/L (155–190 mg/dL)	1
Group 5: molecular genetic testing (DNA analysis)	
(i) Causative mutation shown in the LDLR, APOB, or PCSK9 Genes	8

A 'definite FH' diagnosis can be made if the subject scores .8 points. A 'probable FH' diagnosis can be made if the subject scores 6 to 8 points. A 'possible FH' diagnosis can be made if the subject scores 3 to 5 points. An 'unlikely FH' diagnosis can be made if the subject scores 0 to 2 points. Use of the diagnostic algorithm: per group only one score, the highest applicable, can be chosen. For example, when coronary heart disease and tendon xanthoma as well as dyslipidaemia are present in a family, the highest score for family history is 2. However, if persons with elevated LDL cholesterol levels as well as premature coronary heart disease are present in a family, but no xanthoma or children with elevated LDL cholesterol levels or a causative mutation are found, then the highest score for family history remains 1.

Table-2: Dutch Lipid Clinic Network criteria for diagnosis of heterozygous familial hypercholesterolemia in adults

Network Criteria. (Table 2)³

A diagnosis of homozygous familial hypercholesterolemia was made because of of significant left main coronary ar-



Figure-3: Xanthelasmas; **Figure-4:** Xanthomas over the knees

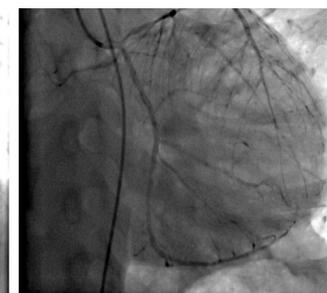
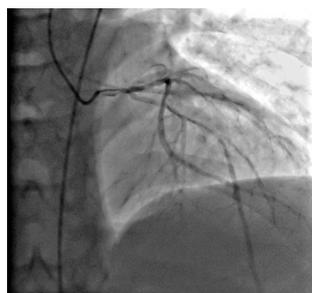


Figure-5: CAG (AP cranial view) showing involvement of Left main and LAD & LCX; **Figure-6:** CAG (AP caudal view) showing involvement of Left main and LAD & LCX

tery involvement. In the meantime, he was put on high dose statin (Atorvastatin 80 mg/day) along with anti-ischemic agents.

DISCUSSION

Familial hypercholesterolemia is one of the commonest inherited disorder, though the frequency is considerably higher in some populations because of a founder effect. There is no true estimate of people diagnosed with familial hypercholesterolemia in India. Patients coming to hospitals are screened for their cholesterol levels only without any emphasis on the diagnosis of familial hypercholesterolemia. In western countries, definite criteria for FH have been laid down and cascade screening is routinely done to diagnose FH.³ Reports of homozygous FH are still rare from India and only few cases have been reported. Scant reports may have been due to lack of awareness of the disorder as Indians migrated and settled in Africa have an increased frequency of FH.⁷

The pedigree of the family has been depicted in the figure. Though FH is an autosomal codominant disorder, exogenous factors like environmental, metabolic, and genetic factors influence the clinical phenotype.² This explains absence of CAD in parents and siblings of the index patient despite having significant elevation of LDL-C level. Familial hypercholesterolemia or Fredricksons type IIa hyperlipoproteinemia is an autosomal dominant disorder caused by >900 mutations in the LDL receptor gene present on chromosome 19, leading to lack of functional LDL receptors on the cell surface.¹ This causes decreased uptake of LDL into the cells, particularly into the liver, from the blood, resulting in increased LDL-C.

While FH in heterozygous state has a prevalence of 1 in 500 individuals, homozygous FH is very rare with a prevalence of 1 in 1 million persons.² LDL-C is removed from the plasma in heterozygous state at two- third of normal rate, resulting in two- three fold elevation of LDL-C. In homozygous state it is removed at one- third of the normal rate resulting in 6-8 fold elevation of plasma LDL-C.⁵ Our patient of homozygous FH had LDL-C level of 926 mg/dl. Homozygous FH patients develop xanthomas before the first decade of life. Patients have multiple types of xanthomata, including tuberous, subperiosteal, tendon xanthomas, elevated xanthomatous plaques.⁸ Our patient had all these forms of xanthomata. Besides, he had intertriginous xanthomas in the web spaces of fingers, which is characteristic of homozygous FH. These xanthomas develop because lipid leakage from the vessel into the surrounding tissues, where macrophages subsequently phagocytose these lipids. The cholesterol is not degraded, which accumulates in these cells, giving rise to foamy macrophages. Familial hypercholesterolemia is a common genetic disorder of premature coronary namely acute myocardial infarction and angina, due to lifelong elevated LDL-C If levels.⁹ left untreated heterozygous FH patients develop CAD before age 55, while homozygous patients typically develop CAD very early and if left untreated die before age 20.³ Our patient of homozygous FH was 15 had already developed left main coronary artery stenosis, with involvement of other coronary arteries leading to acute coronary syndrome. While the immediate attention of such patients is to revascularise the coronary arteries, long term therapy includes lifestyle modification including dietary restriction and physical activity.¹⁰ Cholesterol lowering drugs should be initiated immediately which includes high dose statins, ezetimibe, and bile acid binding resins. In homozygous FH cases, lipoprotein aphaeresis is often necessary, which is conducted only in specialised lipid clinics.

CONCLUSION

We report a case of homozygous familial hypercholesterolemia with severe premature atherosclerosis. coronary arteries Despite huge medical advancement, FH is frequently under diagnosed, with a delay in diagnosis of FH is impor-

tant for the patient and also has serious implications for the family members who inherit the same disorder. Early diagnosis and prompt institution of therapy to lower the serum LDL-C level will prevent the patient from developing premature atherosclerosis.

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Functional Disability and Quality of Life Due to Dementia in Post Stroke Patients

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ABSTRACT

Introduction: Stroke is associated with an excess risk of dementia. The aim of this study to determine Quality of Life and Functional Disability is more affected in which type of post-stroke patients in demented patient or non-demented patients.

Material and methods: A total of 30 subjects both male and female were recruited for the study on the basis of inclusion and exclusion criteria after obtaining informed consent. The subjects were divided into two Groups 1 (dementia) and Group 2 (non-dementia) on the basis of scales. And outcome measures on the basis of Stroke-specific quality of life and barthelindex.

Results: Result of this study demonstrated a significant difference of quality of life and barthel index between group 1 and 2 and significant correlation between quality of life and barthel index in group 2.

Conclusion: This study shown significant difference between group 1 (dementia) and group 2 (non-dementia) Quality of life and functional disability is better in non dementia group and statistically significant correlation between group 2.

Keywords: Stroke, dementia, non-dementia, functional disability, quality of life.

INTRODUCTION

The World Health Organization (WHO) definition of the "stroke" is rapidly developing clinical signs of focal (or global) disturbances of cerebral function, with symptom lasting 24 hours or longer or leading to death, with no apparent cause other than vascular origin.¹

Stroke is associated with an excess risk of dementia. Epidemiological studies suggest a several-fold increased incidence of various dementias after stroke. About 700000 persons in the US experienced a new or recurrent stroke during 2002. The large number of strokes, taken in combination with the association of stroke and dementia onset, implies that stroke-related dementia is a major public health issue.² Stroke is the most common acute neurological illness, the leading cause of disability for adults, and the third cause of mortality in developed countries. Cerebrovascular disease was recognized as an important cause of dementia.³

The clinical determinants of dementia included features of the presenting stroke such as its size and location, vascular risk factors such as diabetes mellitus and prior stroke, and host characteristics such as older age.⁴

One year after stroke, the probability of new-onset dementia is 5.4% in patients over 60 years and 10.4% in patients over 90 years.⁵ Cerebrovascular disease is considered to be the second most common cause of dementia; 20%-25% of cases of dementia are due to stroke, and another 10%—15% are attributed to a combination of vascular and Alzheimer's disease.⁶

Post Stroke Dementia (PSD), that includes any dementia after stroke, irrespective of its cause, is therefore a clinical syndrome – and not a disease – and it appears to be one of the main causes of dependency in stroke survivors.

Patient-related variables associated with an increased risk of PSD are increasing age, low education level, dependency before stroke, prestroke cognitive decline without dementia, diabetes mellitus, atrial fibrillation, myocardial infarction, epileptic seizures, sepsis, cardiac arrhythmias, congestive heart failure, silent cerebral infarcts, global and medial-temporal-lobe atrophy, and white-matter changes. Stroke-related variables associated with an increased risk of PSD are stroke severity, cause, location, and recurrence. PSD might be the result of vascular lesions, Alzheimer pathology, white-matter changes, or combinations of these.⁷ Long-term stroke studies have reported age, depression, cognitive impairment, disability, aphasia and poor social network to be associated with poor HRQOL.⁸

Consensus about the definition of QOL has yet to be reached, but most researchers believe it is multidimensional, comprising 3 broad "domains": physical, mental, and social. Duncan and colleagues in the United States recently found that 8 key areas (strength, hand function, activities of daily living, mobility, communication, memory, emotion, and social participation) emerged as the key areas from the patient's perspective. Similarly, Williams et al¹⁶ reported that patients identified 12 key domains (mobility, energy, upper-extremity function, work/productivity, mood, self-care, social roles,

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family roles, vision, language, thinking, and personality).⁹

METHODOLOGY

Participant: Patients of stroke were selected on the bases of inclusion and exclusion criteria and were recruited for study. Purpose of the study was explained to the patients. Written consent form was signed by the patients. Selected subjects were divided into two groups by the assessment of dementia and non – dementia in post stroke

Inclusion criteria: Patient of stroke atleast three months of stroke, dominant hand should not be affected and able to read and write.

Exclusion criteria: Patient of pre diagnosed depression before the attack of stroke, should not be any other neurological disorder and should be less than 80 years.

Outcome measures: Stroke specific quality of life scale for measured quality of life and barthel index to measure functional disability.

Procedure: The whole procedure was explained to each subject and the subjects signed a consent form before performing the study. Participants were assessed using the Mini Mental State Examination (MMSE). Several previous studies, restricted the cognitive profile to this test; however this alone cannot yield a diagnosis for dementia. Thus we used the Clock Drawing Test, Which both completes and improves the detection rate of dementia. Moreover, the Frontal Assessment Battery, which investigates executive duties were administered.¹⁰ And after that we administered Stroke- Specific Quality Of Life Scale and Barthel Index for assessed quality of life and functional disability.

Data analysis: The data was analysed using SPSS software version 17.0 statistical analysis computational package. The arithmetical mean and standard deviation of quality of life and barthel index in group statistics data were evaluated. T-test was used to calculate mean and standard deviation of quality of life and functional disability in dementia group and non dementia group and Pearsons Correlation was used for correlation in both groups. Significant difference between group 1 (dementia) and group 2 (non dementia) of quality of life and barthel index is $p = .000$ and $p = .001$ respectively. And a positive significant correlation of quality of life and barthel index in non-dementia group $p = .012$.

RESULT

In Group 1 mean of quality of life is 19.722 and SD is 8.47005, and in Group 2 is 44.417 and SD is 9.28790. And in Group 1 mean of barthel index is 46.000 and SD is 36.42559 and in Group 2 is 83.333 and Sdis 19.22751.

In fig.1.1 comparison of Quality of Life between Group 1 and Group 2 show statistically significant difference ($p = .001$). Comparison of Barthel Index between In fig.1.2 between Group 1 and Group 2 statistically significant difference ($p = .001$). In fig. 1.3 correlation of Quality of Life and Barthel Index in Group 2 show statistically significant value ($p = .012$).

DISCUSSION

A syndrome of rapidly developing clinical signs of focal (or global) disturbance of cerebral function, with symptoms lasting 24 hours or longer or leading to death, with no apparent cause other than of vascular origin.

A disability is defined by the WHO as any restriction or lack of ability to perform an activity in a manner or within a range considered normal for human beings and reflects the consequences of impairment in terms of functional performance

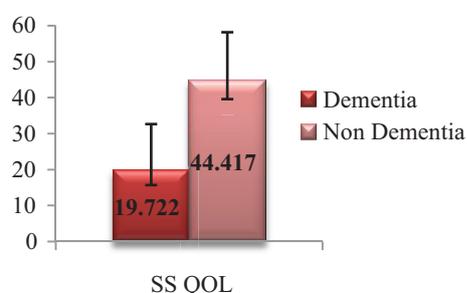


Figure-1: Between group analysis of QOL scores

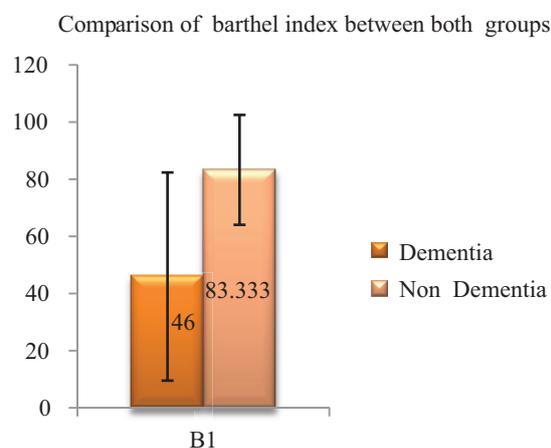


Figure-2: Between group analysis of BI scores

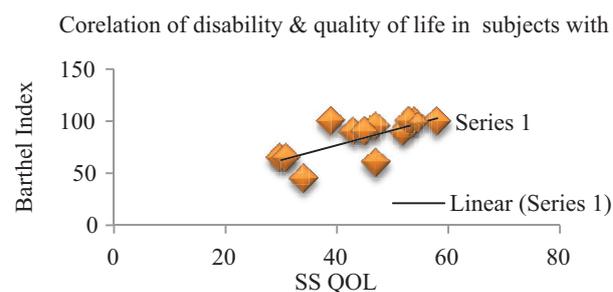


Figure-3: Correlation of Disability and Quality of Life in subjects Without Dementia

and activity by the individual.

In the present study the result depicted that comparison of QOL is higher in group 2. In support of our result Meryl broad et al. (1999) concluded in their study that the dementia affects the QOL.¹¹

QOL in terms of satisfaction of basic human needs: physiological, safety and security, social, self esteem and accomplishment. It assessed on the basis of scores obtained for measures of physical, psychological, emotional and social functioning. Activities of daily living are particularly affected, with a much higher proportion of demented patients affected than non demented patients.

Christian et al. described in his study patients dependent upon others to perform activities of daily living clearly had a lower QOL than independent patients.¹² Elias Olukorede Wahab et al. says early onset dementia regardless of the age it starts, even before the age of 65 changes in the brain can be caused by disease / trauma, and can result in loss of cognitive functioning which includes memory, thinking, reasoning, decision making and verbal communication. It sometimes results in behavioral or personality changes, which all impedes on the QOL of an individual, which includes consumer spendings and production measures.¹³

Early onset dementia has a profound effect on the QOL of patients, as its symptoms are serious, the sense of loss for the people, with EOD are enormous which are the Memory problems, especially short term memory loss, poor judgement and language problems, which includes the pronunciation of words, erratic changes in moods, behaviour and personality, disorientation in time, place and the persons, difficulties in recognition, understanding and comprehension, agitation and hallucination.

Functional disability was found in group 1. Hedda Aguerro Torres et al. (1998) concluded that in a very old population in dementia and cognitive impairment make the strongest contribution to both the development of long term functional dependence and decline in function. Dementia is a determinant for developing functional disability and functional decline because of poor judgement, disorientation, difficulty in understanding, less participation in family, society make them less confident. Patients have a fear to making wrong decisions they can't do any work alone. They afraid to going outside of the home, climbing stairs, and other functional activities due poor judgement. These fears and incapability increase the dependency of the patients.

Correlation of quality of life and barthel index within group 1 show statistically non significant value due to small sample size. Inga H. Suenkeler et al. (2015) concluded that there is non significant correlations were found between QOL and admission scores of BI they give the reason the patients were left sided brain lesion, the presence of limb paresis, hypertension, hypercholesterinemia, history of previous brain infarct, atrial fibrillation and presence of other cardiovascular disease. But there is also a great difference between mean value of dementia and non ddementia described in table no.

6 (non dementia group) and table no. 8 (dementia group). Correlation of QOL and BI group 2 was significant. Due to better memory, better capacity of thinking, judgement, ability to ADL independently may be better. Our result of comparison between dementia and non dementia group also shows that the QOL and functional disability is better in non dementia group

Future research and Limitation

Future investigation in patients with stroke with diagnosis may give us information about the Dementia and Non Dementiataking large sample size equally divided in two groups.

The male and female subjects should keep in two different groups.

CONCLUSION

The conclusion of the study reveals that the subjects shown significant difference between group 1 (dementia) and group 2 (non – dementia). Quality of Life and Functional Disability is better in (non dementia) group 2. And there is statistically non significant correlation within group 1 and statistically significant correlation within group 1 and statistically correlation within group 2.

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