Gestational Age Correlation by Last Menstrual Period, Ultrasonography and Newballardscore

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ABSTRACT

Introduction: The estimation of gestational age at birth is essential to differentiate between small for dates and truly preterm because of different rates of mortality and morbidity in these subgroups. We do come across many babies born to mothers with an unreliable menstrual history, irregular antenatal checkups and ultrasonography. So clinical examination of newborn becomes very important and an attempt was made in our study to see if Newballardscoring system can be used reliably to determine gestational age. The main aim of the study was to estimate gestational age of newborn using New Ballard score when no reliable maternal menstrual history, or the antenatal scan is available as in rural areas. Hence gestational age assessment based on physical and neuromuscular maturity is the only means available to stratify the newborn in to small for dates and truly premature as morbidity and mortality in these subgroups is different and to device treatment protocol accordingly.

Material and methods: Babies born to mothers who had regular antenatal follow-ups at our hospital were selected for study. Expected date of delivery was calculated by first day of menstrual period and prenatal scan was done at different gestational ages is documented and post-natally New Ballard scoring is used to assess gestational age.

Results: Statistical analysis was done by Karl Pearson coefficient of correlation. Mean and standard deviation was calculated and compared to main value.

Conclusion: Regression analysis showed linear relationship of gestational age by Newballardscoring with gestational age by ultrasonography and last menstrual period indicating that we can use Newballardscoring system to assess gestational age at birth when no other means of knowing gestational age is available with the newborn.

Keywords: Gestational Age Assessment, Last Menstrual Period, Ultra Sonography, Newballardscoring

INTRODUCTION

The study was undertaken to correlate gestational age assessment using last menstrual period, prenatal ultrasound and NewBallardscore in our patients who belong to rural population of various districts of Telangana region. In our institute, being a tertiary care referral hospital, we come across neonates who are brought by attendants other than mother with whom there is no information regarding maternal last menstrual period.as irregular periods and oral contraceptives also interfere with last menstrual period and no gestational ultrasound done. In this situation gestational age assessment based on the examination of neonate is essential to stratify the child into small for gestational age or prematurity to device treatment protocol appropriate for the neonate as the mortality and morbidity is different in these subgroups[.4] Hence by our study an attempt is made to see if New Ballard score can be used reliably to determine gestational age.

Gestational age assessment using last menstrual period (LMP)

This age-old method is still followed everywhere. It is simple and quite reliable. The expected date of delivery (EDD) and the gestational age of the infant are calculated by adding nine calendar months and seven days, to first day of the last menstrual period. This method may fail when the last menstrual period will not be available especially if the second pregnancy follows the first in the amenorrhoeic period.

1. The menstrual cycles may be irregular.
2. Mother may not remember the exact date.
3. Oral contraceptive pills may cause ovulatory cycle disturbances.
4. Post conception bleeding may confuse the issue.

Gestational age assessment by neonatal maturity scoring

In 1979 Jeane Ballard et al[1] introduced a simplified method for clinically determining fetal maturation of newborn infants. This included six physical and six neurological criteria. The physical criteria were skin, lanugo, plantar surface, breast, eye/ear, genitalia. Neuromuscular criteria were posture, square window, arm recoil, popliteal angle, scarf sign and heel to ear maneuver. She found that the reliability of this method was poor prior to 30 hours or after 42 hours of life. Also the total score was more accurate and the accuracy was similar to that obtained by the previously employed, more complicated systems.

In 1991 the Ballard maturational score was refined and expanded to achieve greater accuracy and to include extremely premature neonates.[2] The physical and neurological criteria were expanded to identify the neonates less than 26 weeks of gestational age. In this method, the foot length and fusion of eyelids were added. The difference of agreement between gestational age assessed by this method

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with the last menstrual period and ultrasound method was found to be less than two weeks.

The criteria used for estimating gestational age after birth may be divided into those which are based on physical maturation and those dependent on the development of the nervous system.

Physical criteria

Plantar crease: Plantar surface before 28 weeks has no creases; between 28-32 weeks, a few faint red lines appear over the anterior aspect (forward) of the foot: between 34-37 weeks 1 to 2 anterior transverse creases appear; between 37 -39 weeks creases cover the anterior 2/3 of the sole; at term creases cover the entire plantar aspect of the foot and involve the heel.

Skin: Skin before 28 weeks is gelatinous, red, translucent and friable; between 28-37 weeks skin over-the abdomen is thin, translucent pink with visible veins; between 37-39 weeks it is smooth, pink, increased thickness with rare visible veins over the abdominal wall; after 40 weeks vessels will disappear, skin may be parchment-like or leathery with deep cracking. Preterm babies' fingernails do not reach fingertips; at term nails reach fingertips; in post term babies nails pass finger tips and are firm.

Vernix: Vernix before 34 weeks is thick and covers the entire body; between 34 - 38 weeks it is absorbed gradually, vernix over shoulders and neck creases is absorbed last; between 38-40 weeks it is now found only in skin folds; after 42 weeks it is not seen.

Ear cartilage: Cartilaginous development before 34 weeks is very immature, cartilage is not present in any part of the ear, the pinna is flat and formless, remains folded; between 34-37 weeks pinna curved, soft with slow recoil; between 34-40 weeks formed and firm with instant recoil; After 40 weeks thick cartilage is present and ear is stiff.

Breast: Breast development has two criteria; nipple formation and breast tissue development. Before 28 weeks nipples imperceptible; between 28-32 weeks nipples are barely visible, no areola; between 32-37 weeks well defined nipple is present and areola is stippled; between 38-40 weeks well defined nipple is present and fully raised areola is present; Breast tissue before 33 weeks, no- nipple bud can be palpated; between 33 to 36 weeks l-2mm between 36 to 38 weeks 3-4mm and at 38 to 40 weeks it is 5-l0mm.

Scalp Hair: Before 36 weeks scalp hair is fine and fuzzy, difficult to distinguish individual strands, seems to appear in clumps, often extends further down on forehead and on the side of the face than in term neonates; after 36 weeks it is coarse and silk strands present.

Lanugo: After 20 weeks lanugo begins to appear; at 28 weeks it is abundant; after 28 weeks lanugo vanishes first from face, then from remainder of the body; at 38 weeks, bald areas are present, a slight amount may remain over the shoulders.

Genitalia: In breech or difficult deliveries the genitalia may become bruised or edematous in males. Before 28 weeks, scrotum is empty and flat; between 28-30 weeks, testes is undescended into the scrotal sac; between 30-36 weeks it is descending with few rugae over the scrotum, right testes usually descends first; between 36-39 weeks, it has descended into the scrotum and has become pendulous and rugation is complete. In females before 28 weeks, clitoris is prominent, labia is flat, between 28-32 weeks prominent clitoris and enlarged labia minora is present; between 33-36 weeks, labia majora are widely separated and equally prominent labia minora present; between 36-39 weeks it extends over the labia minora but not over the clitoris; after 39 weeks it completely covers the labia minora and clitoris.

Neuromuscular criteria

Posture: Posture is observed when neonate is quiet and in the supine position. The score is based on the degree of flexion of the arms, knees and hips including adduction of the hips. Before 30 weeks, neonate is hypotonic, little or no flexion is seen in the extremities; between 30-38 weeks varying degrees of flexed extremities are present; at 38-42 weeks neonate may appear hypertonic.

Square window: Square window is measured by flexing the neonate's hand to the forearm using gentle pressure. The angle decreases with advancing gestational age. Before 26 weeks, wrist cannot be flexed to 90°; before 30 weeks wrist can be flexed no more than 90°; between 36-38 weeks, wrist can be flexed no more than 45°; between 38-40 weeks flexibility is maximized; palm can be brought to the forearm.

Scarf sign: Scarf sign is assessed with the neonate in a supine position; head in the mid-line, the arm is gently pulled across the chest and posteriorly. Scores are based on the position of the elbow in relation to the chest structures. Before 28 weeks elbow passes the torso when gently pulled; between 28-34 weeks elbow passes the opposite nipple line; between 34-36 weeks it can be pulled past the midline, offers no resistance; between 36-40 weeks it can be brought to midline, some resistance is noted; after 40 weeks it doesn't reach midline, maneuver is difficult or impossible to perform.

Heel-to-Ear Maneuver: Heel-to-Ear Maneuver is done when neonate is placed supine with the pelvis flat while the foot is pulled gently toward the ear. The score is based on the distance from the heel to ear. This maneuver is invalid in breech delivery. Before 34 weeks there is no resistance and can be performed without difficulty; after 40 weeks this maneuver is difficult to perform.

Arm recoil: Arm recoil can be assessed by positioning the neonate in supine position, the arms are flexed for five seconds, and then the arms are fully extended and released. The neonate is graded to the extent that the arms return rapidly to full flexion. Before 28 weeks there is no recoil; between 28-32 weeks slight recoil present; between 32-36 weeks recoil does not pass 90°; between 36-40 weeks recoil is up to 90°; after 40 weeks rapid full recoil is present.

Popliteal angle: Popliteal angle is measured with the neonate in supine position. The thigh is placed in the knee-

chest position. The leg is then extended and the popliteal angle is measured. Before 26 weeks angle is 180°; between 26-28 weeks angle is 160°; between 28-32 weeks angle is 140°; between 32 -36 weeks angle is 120°; 36-40 weeks angle is 100°; between 40-42 weeks angle is 90°, after 42 weeks angle of less than 90°.

Tone: Before 30 weeks neonate is hypotonic lies in the same position in which he/she is placed and moves very little; between 30-34 weeks it begins in the lower extremities; between 34-36 weeks neonate draws his/her knees to a frog-like position; between 36-40 weeks total flexion is noted.

When it was recognized that infants of low birth weight could be small because of shorter gestation, or because of intra uterine growth retardation, methods to distinguish them on the basis of clinical assessment became important.

Dubowitz et al[4] in their study consisting of 2176 new born babies concluded that when a combination of both external physical and neurological criteria was applied, the gestational age assessment was more reliable. They used 10 neurological and 11 physical criteria. Neurologic criteria used were posture, window, dorsiflexion of foot, arm recoil, leg recoil, and popliteal angle. Heal to ear, maneuver, scarf sign, head lag, ventral suspension. Physical criteria were edema, skin texture, skin color, skin opacity, lanugo, plantar creases, nipple formation, breast size, ear form, ear firmness and genitalia.

Parkin et al[4] devised a simple and rapid gestational age assessment scoring system where only four physical criteria were used. They were skin texture, skin colour, breast size and ear firmness. The examination was done between 12 to 36 hours after delivery. The mean 95% confidence limits for the data was ± 15 days.

Meharban Singh et al[5] and in their study assessed gestational age by New Ballards score and Dubowitz score. They found that these methods were equally effective and reliable. Again in 2002 the scoring system was expanded by Hellman F. L et al[6] to accommodate the preterm and post term infants. He assessed gestational age of 578 newborn infants and compared with that of the ultrasound assessment. He found that it was valid and the entire newborn population.

Gestational age assessment by prenatal ultrasound:

One of the major applications of diagnostic ultrasound in Obstetrics is the estimation of gestational age. This estimate is the cornerstone of prenatal care.

The Important parameters used in prenatal ultrasound are gestational sac diameter, crown-rump length, biparietal diameter, head and abdominal circumference, femur length.

Guidelines followed for assessment of gestational age by prenatal ultrasound were taken from American Institute of Ultrasound Medicine.[7] Biparietal diameter, Head circumference, Abdominal circumference and Femur length were used as criterion.

The main aim of the study was to estimate gestational age of newborn using New Ballard score when no reliable maternal menstrual history, or the antenatal scan is available as in rural areas. Hence gestational age assessment based on physical and neuromuscular maturity is the only means available to stratify the newborn in to small for dates and truly premature as morbidity and mortality in these subgroups is different and to device treatment protocol accordingly.

MATERIAL AND METHODS

100 neonates born to mothers who had antenatal follow up done at Department of Obstetrics and Gynecology and

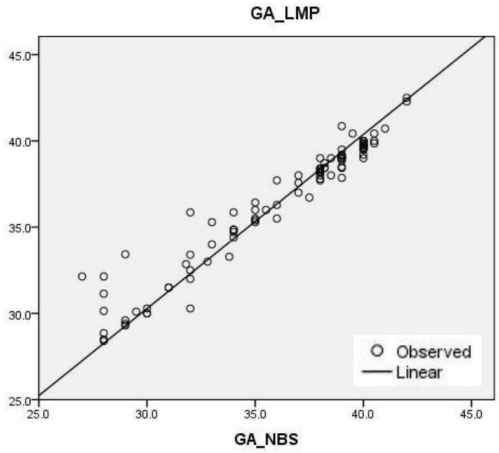

Figure-1 regression analysis curve plot indicates that there is linear relationship with positive correlation between GA_LMP and GA_NBS and also the sample of 100 neonates in our study represents the characters of any other sample from the same population to which it belongs.

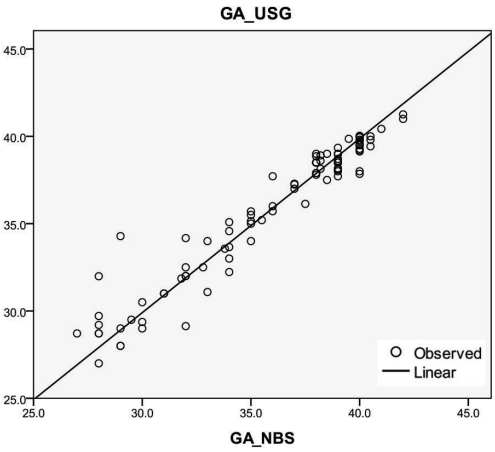

Figure-2 regression analysis curve plot indicates that there is linear relationship with positive correlation between GA_USG and GA_NBS and also that the sample of 100 neonates in our study represents the characters of any other sample from the same population to which it belongs. The table-4 and figure-3 shows that gestational age by New Ballard Score shows significant correlation with age by LMP and USG in neonates irrespective of their age at birth (Pre Term, Term, Post Term), Sex (Male or Female), order of birth (Primi or Multigravida). The Analysis of Variance (ANOVA) test (F test) for comparison of means of GA_LMP, GA_USG and GA_NBS across all groups showed no significant variation i.e.; P value was found more than 0.05. [If the P value were to be less than 0.05 then it would mean that there is significant difference or variation between the three means (i.e. GA_LMP, GA_USG and GA_NBS) and they are not correlatable]. ANOVA test is indicating here that the means are similar and co-relatable.

PROFORMA

Baby of Hosp No.

Mother's Hosp No. Date of Birth

Time of Birth Sex

Maternal History:

Age Years Gravida Para Living Abortion

LMP EDD

Mode of Delivery Normal Vaginal/ LSCS /

Type of Anaesthesia

Nil / Local / Spinal / General

FHR 100 / 100-160 / 160

APGAR SCORE 1min 5min 10 min

Resuscitation Yes / No.

Examination of Newborn

Birth weight: Length: Head Circumference:

ULTRASONOGRRAPHIC EXAMINATION

Date of Examination: Gestational age by LMP

Criteria	GA on date	GA at birth
CRL		
biparietal diameter		
HC	AC	FL

Average GA according to USG

Gestation age at birth according to USG

New Ballard Score

Estimation of Gestational age by examination ..... Weeks.

Time of examination Hours Minutes

Neuromuscular Scoring

Criteria	Score
1. Posture	
2. Arm Recoil	
3. Popliteal Angle	
4: Scarf Sign	
S. Heal to Ear	

Physical Scoring

Criteria	Score
1. Skin	
2. Lanugo	
3. Plantar Surface	
4. Breast	
5. Eye / Ear	
6. Genitals Male /	Female

Total Score : **Gestational Age by New Ballard Score:**

Type of New Born

Term AGA / Term - SGA / Term - LGA

Preterm - AGA / Preterm - SGA / Preterm - LGA

Posterm AGA / Posterm - SGA / Posterm - LGA

prenatal ultrasound done in the Department of Radiology at our hospital were selected for study. The study period is during January 2010 to October 2011.

Inclusion Criteria

For mothers

1. Mothers who had regular menstrual cycle
2. Known last menstrual period.
3. At least has one ultrasound report done during any time of pregnancy

For Babies

1. Term as well as preterm singleton babies
2. No birth asphyxia or prenatal complication.
3. Babies delivered either by normal vaginal delivery or lower segment caesarean section

Exclusion criteria

For Mothers

1. Irregular menstrual cycle
2. Last menstrual period not known
3. Ultrasound not done regularly.

For babies

1. Babies born outside CAIMS
2. Multiple gestation babies.
3. Babies born with birth asphyxia or any perinatal complication.
4. Babies delivered by breach or forceps delivery

EDD was calculated by last menstrual period by adding nine calendar months and seven days to first day of last menstrual period.

Prenatal ultrasound done at different gestational ages was documented. Gestation age at birth from prenatal ultrasound was calculated by adding gestational age interval in weeks (i.e. date of prenatal ultrasound done to date of delivery) to ultrasound estimated gestation age.

Postnatal gestational age assessment was done by New Ballards score within 24hours after birth.

A proforma was made accordingly and consent was taken from babys attendents and Ethical board of college has given clearance.

STATISTICAL ANALYSIS

Statistical analysis was done by using Karl Pearson coefficient of correlation. Mean and standard deviation was calculated and compared to main value. Analysis was computed by using statistical package SPSS. A P-value of $P<0.05$ (*) is significant, $P<0.0l$ (**) is highly significant

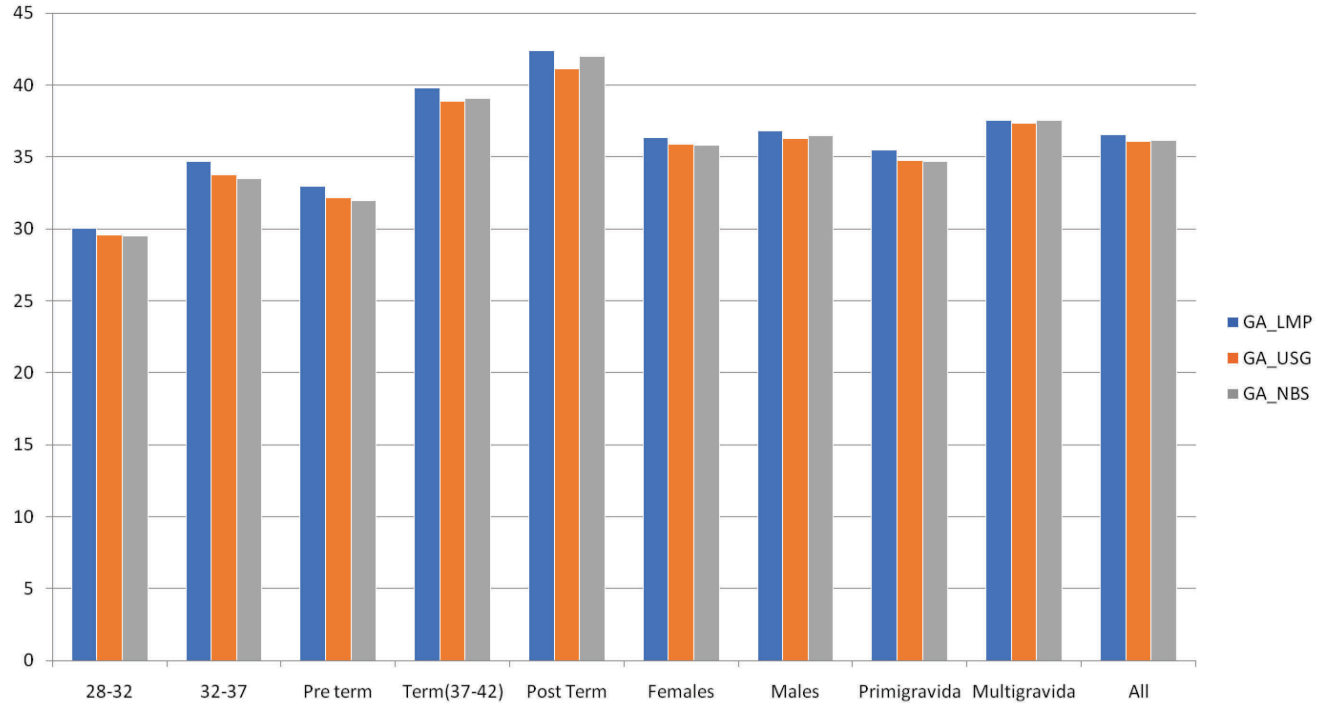

Figure-3: Chart showing distribution and correlation of means of gestational age according to various groups.

Descriptive Statistics				
		Mean	**Std. Deviation**	**N**
GA_LMP		36.579	3.6234	100
GA_USG		36.090	3.8684	100
GA_NBS		36.165	4.1191	100
Correlations				
		GA_LMP	**GA_USG**	**GA_NBS**
GA_LMP	Pearson Correlation	1	.972**	.968**
	Sig. (2-tailed)		.000	.000
	N	100	100	100
GA_USG	Pearson Correlation	.972**	1	.966**
	Sig. (2-tailed)	.000		.000
	N	100	100	100
GA_NBS	Pearson Correlation	0.968**	0.966**	1
	Sig. (2-tailed)	.000	.000	
	N	100	100	100
**. Correlation is significant at the 0.01 level (2-tailed).				

Table-1: Statistical analysis of correlation of Gestational age of neonates between 28-43 weeks (100 in number, including all age groups) according to Last Menstrual Period (GA_LMP), prenatal Ultrasonography (GA_USG) and New Ballard Score (GA_NBS).

Model Summary and Parameter Estimates						
Dependent Variable: GA_LMP						
Equation	**Model Summary**					**Parameter Estimates**
	R Square	**F**	**df1**	**df2**	**Sig.**	**b1**
Linear	.999	107674.494	1	99	.000	1.009
The independent variable is GA_NBS.						

Table-2: Regression analysis of Means of GA_NBS with means of GA_LMP in all the neonates (total 100).

Model Summary and Parameter Estimates						
Dependent Variable: GA_USG						
Equation	**Model Summary**					**Parameter Estimates**
	R Square	**F**	**df1**	**df2**	**Sig.**	**b1**
Linear	.999	115691.396	1	99	.000	.997
The independent variable is GA_NBS.						

Table-3: Regression analysis of Means of GA_NBS with means of GA_LMP in all the neonates (total 100).

Gestational age in weeks	Number	Mean±Std. Deviation GA_LMP	Mean±Std. Deviation GA_USG	Mean±Std. Deviation GA_NBS	Correlation of GA_NBS with GA_LMP	Correlation of GA_NBS with GA_USG	ANOVA test	
							F statistics	P value
28-32	16	30.06±1.06	29.60±1.47	29.53±1.40	0.693**	0.458*	0.758	0.474
32-37	26	34.71±1.46	33.73±2.14	33.51±2.53	0.828**	0.833**	2.427	0.095
Pre Term(28-37)	42	32.94±2.63	32.16±2.77	31.99±2.91	0.877**	0.875**	1.402	0.249
37-42(Term)	56	39.09±0.82	38.85±0.81	39.08±1.02	0.840**	0.754**	2.134	0.121
Post term	2	42.39±0.15	41.12±0.18	42±0	-	-	-	-
All Females	48	36.36±3.72	35.90±4.01	35.84±4.38	0.957**	0.962**	0.237	0.789
All Males	52	36.78±3.51	36.26±3.75	36.46±3.87	0.982**	0.972**	0.259	0.771
Primigravida	48	35.51±3.86	34.76±4.10	34.69±4.53	0.959**	0.956**	0.569	0.566
Multigravida	52	37.56±3.10	37.31±3.21	37.52±3.20	0.984**	0.974**	0.093	0.910
Normal Delivery	54	35.24±3.79	34.59±4.02	34.69±4.25	0.966**	0.969**	1.28	0.27
LSCS	46	38.14±2.69	37.84±2.82	37.88±3.22	0.955**	0.943**	0.143	0.866
All ages	100	36.57±3.62	36.09±3.86	36.16±4.11	0.968**	0.966**	0.449	0.638

**Correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05 level (1-tailed).

Table-4: Summary table of statistical analysis of correlation of Gestational age assessment by New Ballard Score

Birth weight in Kg.	Number	GA_LMP Mean±Std. Deviation	GA_USG Mean±Std. Deviation	GA_NBS Mean±Std. Deviation	Correlation of GA_NBS with GA_LMP	Correlation of GA_NBS with GA_USG
<1	1	31.1	32	28	-	-
1-2	30	32.11±2.50	31.23±2.61	31.15±2.63	0.844*	0.850**
2-3	45	37.97±1.73	37.69±1.98	37.74±2.15	0.941**	0.937**
>3	24	39.77±1.06	39.31±0.91	39.80±1.03	0.828**	0.839**
All	100	36.57±3.62	36.09±3.86	36.16±4.11	0.968**	0.966**

**Correlation is significant at the 0.01 level (2-tailed), *Correlation is significant at the 0.05 level (1-tailed).

Table-5: Statistical analysis of correlation of Gestational age of neonates based on the birth weight according to Last Menstrual Period (GA_LMP), prenatal Ultrasonography (GA_USG) and New Ballard Score (GA_NBS).

and a value of P<0.001 (***) is considered as very highly significant. P value greater than i.e. P>0.05 is considered not significant. P value is expressed in calculation of correlation coefficient. And it is also expressed in analysis of variance of means done by ANOVA (Analysis of variance or F test) test to know if there is any significant difference in means.

RESULTS

In our study male babies are 52% and female babies 48%. Term babies are more than preterm .Primigravida are more in number and newborns of weight 2 to 3 kg as depicted in table 4.Our study shows that New Ballard score correlates more with gestationalage according to LMP than USG when all age groups are included in analysis but shows high significance with both USG and LMP at P value less than 0.01 as in table-1. The gestational age by New Ballard score shows significant correlation with age by LMP and USG in neonates of all weights above 1kg.However thr correlation was maximum between 2 to 3 kg newborns as in table 5.The table 4 shows that gestational age by New Ballard score shows significant correlation with age by LMP and USG in neonates irrespective of their age at birth,sex,order of birth.

The above table shows that New Ballard score correlates more with gestational age according to LMP (correlation of 0.968**) than USG (correlation of 0.966*) when all the age groups are included in the statistical analysis. However, it shows high significance with both USG and LMP at P value less than 0.01. Table-2 shows regression analysis of Means of GA_NBS with means of GA_LMP in all the neonates (total 100). Table-3 shows regression analysis of Means of GA_NBS with means of GA_LMP in all the neonates (total 100).

Table-5 shows that gestational age by New Ballard Score shows significant correlation with age by LMP and USG in neonates of all weights above 1 kg. However the correlation was maximum in neonates weighing between 2-3 Kgs.

DISCUSSION

In our study the Pearson correlation coefficient was 0.693** (significant at the 0.01 level) while comparing gestational age by LMP and NBS in the age group of 28-32 weeks. It is 0.828** and 0.840** in the age groups of 32-37 and 37-42 weeks respectively (Table-4). Though the correlation is significant at 0.01** level in all age groups it is maximum in the term age group (37-42 weeks). This statistically significant correlation was also seen in study done by Ballard et al,[2] Whitehouse et al[8] Hutchison DJ et al[9] and Kutz A et al[10] Our study had good correlation between last menstrual period and New Ballard score both in term and preterm babies. Correlation with post term babies was not statistically significant as the number of post term babies were only 2 in the present study.

Ballard et al[2] study indicates that New Ballard score is useful in estimating the age of very premature infants less than 28

weeks gestation. In our study there were no neonates less than 28 weeks and hence we are unable to confirm or refute the study. Koga et al[11] concluded that New Ballards score is a valuable method of assessing gestational age. Torstein Vik et al[12] concluded that gestational age assessment by New Ballard's score may be useful in assessing gestational age, in particular when biparietal diameter and last menstrual period is uncertain.

Regression analysis (Table 2 and 3) showed linear relationship of GA_NBS with GA_LMP and GA_USG indicating that the sample population of our study is representative of any other sample from the same population. Similar regression curve which is linear is also seen in the study done by Ballard et al.[2] Inter-observer variation in estimating by New Ballard score and bias in assessment of gestational age when obstetric age is known by last menstrual period were studied thoroughly by Ballard et al,[2] Gagliardi et al,[13] and Smith et al[14] have concluded that there is no possibility of bias or interobserver variation in estimation. In our study the possibility of bias is eliminated by obtaining scores in all neonates by one individual only.

In a recent review published by Opara P[15] it is found that estimation of gestational age by New Ballard score is reliable which is same as the observation obtained in our present study on rural population attending our hospital, Chalmeda Anand Rao Institute of Medical Sciences (CAIMS).

CONCLUSION

Gestational age assessment by New Ballard Score (GA_NBS) correlated with high level of significance (P value less than 0.01) with gestational age assessment by Last menstrual period (GA_LMP) and gestational age assessment by Ultrasonography (GA_USG) in neonates of all age groups be it preterm or term. Birth weight of the neonate or sex of the baby does not influence the age assessment by New Ballard score. Mode of delivery or the gravida does not influence the assessment of gestational age by New Ballard Score. So we can use New Ballard score to assess the gestational age with 95% confidence limits when no other means of knowing gestational age is available with the neonate.

Abbreviations

DOB – Date of Birth, LMP – Date of Last menstrual period, GA_LMP – Gestational age according to LMP, USG_DT- Date of Ultrasonogram done, USG_AGE – Gestational age (intra uterine) up to the day of USG report, GA_USG - Gestational age according to the USG report, NBS – New Ballard score, GA_NBS- Gestational age according to the New Ballard score, SEX – M-Male or F- Female, Wt – Weight at birth in Kg., M.O.D – Mode of delivery, ND-Normal Vaginal Delivery, LSCS- Lower segment caesarean section.

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