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PREDICTION OF GESTATIONAL AGE BY ULTRASONIC MEASUREMENT OF THE BIPARIETAL DIAMETER IN THIRD TRIMESTER

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ABSTRACT

Background: The ability to quickly and accurately determine gestational age (GA) can help improve obstetric care by allowing for the timing of necessary interventions to be as early as possible and avoiding those that are not absolutely necessary. For measuring different baby parts in pregnant women, ultrasound scans are thought to be the most efficient, precise, and safe procedure.

Objective: To examine the accuracy of gestational age prediction using ultrasound to measure biparietal diameter in the third trimester.

Materials and Methods: 200 pregnant women who visited the study institute's antenatal clinic in the third trimester were included in the study. Age, address, and other specific demographic information were acquired. A thorough history was collected, including details on her LMP, cycle regularity, and cycle length. Then, each patient got a thorough checkup, which included a general and systematic examination. LMP and abdominal examination provided confirmation of the gestational age at the time of scanning. The study's female participants received ultrasonography. To prevent bias in observations, only one operator performed the ultrasonography. The Biparital diameter received particular consideration as all foetal characteristics were evaluated. Microsoft Excel was used to enter the data that was gathered. Epi Info statistical software was used for the primary analysis.

Results: The majority of the patients (38%) were in the 20–25 year age range, followed by 72 patients in the 25–30 year range. The LMP was used to calculate gestational age, and it was found that the majority of patients (14%) were 35 weeks along, followed by 30 weeks (12%), and at least 40 weeks gestation. 33.27 3.334 weeks was the average gestational age. The gestational age was determined by BPD on ultrasound, and it was discovered that the majority of the women were 38 weeks along (16%), followed by 33 weeks along (13%) with a mean gestational age of 35.44 2.48 weeks. In 26 individuals, GA in LMP was shown to be similar to BDP. With a P-Value of 0.05, the correlation coefficient between GA by LMP and GA by BDP was 0.9268. The connection between GA by LMP and BDP was therefore substantial.

Conclusion : With a correlation coefficient of 0.9268 and a P-value of 0.05, the gestational age determined by biparital diameter was correlated with the gestational age determined by the LMP. Consequently, we draw the conclusion that the Biparital diameter can be helpful in assessing the Assessment of Gestational Age in Third Trimester and the findings.

Key Words: BPD, third trimester, and age assessment using ultrasound.

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INTRODUCTION

In order to provide the best obstetric care, gestational age must be accurately assessed[1]. From the first trimester till birth, proper pregnancy dating is crucial for managing the pregnancy. It is especially vital for evaluating viability in premature labour and postdates deliveries[2-5]. Clinically determining gestational age was formerly done by caregivers using a combination of history and physical examination prior to the widespread use of ultrasonography. The clinical estimation of gestational age often relies on clinical history (menstrual cycle length, regularity, and memory of the first day of the most recent period), with physical examination or other signs and symptoms serving as confirmation[6-8]. The ability to quickly and accurately determine gestational age (GA) can help enhance obstetric care by allowing for the best timing of necessary procedures and the avoidance of those that are not necessary. The most efficient, accurate, and safest method for measuring different foetal parts in expectant women is thought to be an ultrasound scan. It has been suggested and implemented in several jurisdictions that dating a pregnancy using ultrasound measures is clinically superior to menstrual dating with

or without ultrasound when it is carried out with quality and precision. Clinicians now have a way to gauge the size of the foetus and, consequently, the gestational age[9-11]. The measurement of body characteristics will enable confirmation of the foetus' size and growth and will be extremely beneficial for the diagnosis and treatment of intrauterine growth retardation in late pregnancy. A straight line drawn between the sides of the head is called the biparietal diameter. According to several researchers, measuring the biparietal diameter before the 30th week of pregnancy can provide accurate results, but accuracy declines after that point. Due to the fetus's breech presentation, it has been difficult to measure the biparietal diameter[12].

Objective:

To examine the accuracy of gestational age prediction using ultrasound to measure biparietal diameter in the third trimester.

METHOD AND MATERIALS

In order to examine the value of measuring the length of the foetal femur in determining gestational age in the third trimester, the current study was carried out in the department of obstetrics and gynaecology. The research was carried out from June 2012 to Oct. 2014. To choose the study population, the following inclusion and exclusion criteria were applied.

Inclusion Requirements

1. Pregnant woman in third trimester with Singleton live pregnancy attending OPD of study institute.
2. Woman with known last menstrual period and regular cycles.
3. Woman not on any oral contraceptive pills for last three months before last menstrual period.

Exclusion Criteria

1. Woman with unknown last menstrual period and irregular cycles.
2. Intrauterine growth restriction, polyhydramnios and oligohydramnios, Multiple Pregnancies.
3. Congenital anomalies of baby.
4. Medical disorders of pregnancy like DM, PIH, heart diseases etc.

Thus, 200 pregnant women who visited the study institute's antenatal clinic in the third trimester were included in the study using the aforementioned inclusion and exclusion criteria. Each patient's complete demographic information, including age, address, and other details, was gathered using a pre-designed proforma. A thorough history was collected, including details on her LMP, cycle regularity, and cycle length. Then, each patient got a thorough checkup, which included a general and systematic examination. LMP and abdominal examination provided confirmation of the gestational age at the time of scanning. The women were instructed to drink a lot of water orally, and they arrived at the USG clinic with a full bladder. They were forced to lie on their backs with their abdomens exposed from the xiphisternum to the pubic symphysis. Then a probe was used to scan the belly in order to collect various foetal data. To prevent bias in observations, only one operator performed the ultrasonography. All foetal parameters were evaluated, and the biparital diameter received particular focus. Microsoft Excel was used to enter the data that was gathered. Epi Info statistical software was used for the primary analysis.

RESULTS

Table 1: Distribution According to Age and gravida

Variable		Frequency
Age Group	<20 Years	28
	20-25 Years	76
	25-30 Years	72
	30-35 Years	20
	>35Years	4
Gravida	Primi	116
	Multi	84

Out of 200 patients, majority of the patients (38%) belonged to age group 20- 25 years followed by 72 patients in 25-30 years. It was seen that 58% were Primi Gravida and 42% were of multi gravida.

Table 2: Distribution According to Gestational Age by LMP and Fetal Biparital diameter

GA (Weeks)		Frequency
GA (Weeks) by LMP	28 Week	16
	29 Week	18
	30 Week	24
	31 Week	18
	32 Week	8
	33 Week	20
	34 Week	14
	35 Week	28
	36 Week	12
	37 Week	18
	38 Week	12
	39 Week	8
	40 Week	4
GA (Weeks) by BPD	28 Week	0
	29 Week	6
	30 Week	2
	31 Week	10
	32 Week	20
	33 Week	26
	34 Week	16
	35 Week	6
	36 Week	18
	37 Week	22
	38 Week	32
	39 Week	42
	40 Week	0

Gestational age was calculated according to the LMP and it was observed that majority of the patients were of 35 weeks gestation (14%) followed by 30 weeks (12%) and minimum were of 40 weeks gestation. The mean gestational age was 33.27 ± 3.334 weeks. The gestational age was calculated by using BPD on ultrasonoghraphy and it was seen that majority of the women were of 38 weeks of gestational age (16%) followed by 33 weeks of gestation (13%) with mean gestational age of 35.44 ± 2.48 weeks.

Table 3: Difference between Gestational Age estimated by LMP and Fetal Biparital diameter

Difference Between USG (BPD) and LMP	Frequency
No difference	26
1-2 Week	52
2-3 Week	58
3-4 Week	52
4-5 Week	12
>5 Week	0
Total	200

Difference between GA (BPD and LMP) was observed in 174 patients out of 200 patients. Maximum observed difference between GA by BDP and LMP is 2 to 3 weeks. Similarity of GA in LMP with BDP was observed in 26 patients.

Table 4: Correlation of gestational age estimated by LMP with gestational age estimated by Fetal Biparital diameter

		LMP	BDP
LMP	Pearson Correlation	1	0.9268
	P-Value	-	.000
	N	100	100

From above table it was evident that the Correlation coefficient between GA by LMP and GA by BDP was 0.9268 with P-Value <0.05. Thus there was significant correlation between GA by LMP and BDP.

DISCUSSION

The goal of the current study was to investigate the ability of third trimester biparietal diameter ultrasound to predict gestational age. 200 pregnant women in their third trimester who were enrolled in the study's OPD and had regular cycles and last menstrual period information participated in the study[13-15]. Out of 200 patients, it was observed that 38% of the patients were in the 20–25 year age range, followed by 72 patients in the 25–30 year range. The age range of the study's ladies was 18 to 35 years, with a mean age of 25.22 4.36 years. The results were equivalent to those of Kansaria and Parulekar, Sherif A. Akl et al., and Konje et al. 58% of women were found to be Primi Gravida, whereas 42% were found to be Multi Gravida. Similar results were seen in the studies conducted by Sherif A. Akl et al. and Patre et al. The LMP was used to calculate gestational age, and it was found that the majority of patients (14%) were 35 weeks along, followed by 30 weeks (12%), and at least 40 weeks gestation. 33.27 3.334 weeks was the average gestational age[16-18]. The gestational age was determined using BPD on ultrasound, and it was discovered that the majority of the women were 38 weeks along (16%), followed by 33 weeks along (13%) with a mean gestational age of 35.44 2.48 weeks. The results concurred with those published by Hadlock et al, Shepard and Filly, Kurtz et al, and Sabbagha and Hughey. Out of 200 patients, 174 patients showed a difference between GA (BPD and LMP). The GA by BDP and LMP differences are typically 2 to 3 weeks apart. In 26 patients, GA in LMP was found to be similar to BDP. 33.27 3.334 weeks was the average gestational age. The gestational age was determined using BPD on ultrasound, and it was discovered that the majority of the women were 38 weeks along (16%), followed by 33 weeks along (13%) with a mean gestational age of 35.44 2.48 weeks[19-21]. The results concurred with those published by Hadlock et al, Shepard and Filly, Kurtz et al, and Sabbagha and Hughey. Out of 200 patients, 174 patients showed a difference between GA (BPD and LMP). The GA by BDP and LMP differences are typically 2 to 3 weeks apart. In 26 patients, GA in LMP was found to be similar to BDP. The correlation coefficient between GA by LMP and GA by BDP was found to be 0.9268, with a P-Value of 0.05. The correlation between GA by LMP and BDP was therefore substantial. Sherif A. Akl, et al., Kansaria and parulekar and konje, et al., Patre, et al., and Kumar, et al. all reported similar discoveries[22-24]. Many researchers have looked into how the BPD and GA relate to one another. The GA can be estimated with some degree of accuracy using BPD. The correlation coefficient between GA and BPD in the current study is equal to 0.9268, showing that BPD and GA have a strong relationship. According to some reports, determining gestational age can be done accurately using the biparietal diameter. Before 30 weeks of gestation, biparietal diameter measurements can accurately predict gestational age, but after that point, their accuracy decreases. It has been established that difficult circumstances, including a deeply engaged foetal head, direct occipito-anterior and occipito-posterior positions, and breech presentation, can make it difficult to accurately measure the biparietal diameter[25,26]. Furthermore, real-time ultrasound makes it simple to measure the femur length even in conditions where it is challenging to measure the biparietal diameter.

CONCLUSION

The gestational age estimated from Biparital diameter was correlated with the gestational age calculated from the LMP with Correlation coefficient of 0.9268 with P-Value <0.05.Thus we conclude that the Biparital diametercan be useful in evaluation of assessment of gestational age in third trimester.

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