Research Article

TO STUDY THE ASSOCIATION BETWEEN GESTATIONAL AGE AND BIPARIETAL DIAMETER & ABDOMINAL CIRCUMFERENCE

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A R T I C L E   I N F O

A B S T R A C T

Background- Ultrasound measurement of fetal biometry is an important and commonly used tool in antenatal care.
Methods- The present study was conducted in the Department of Anatomy, in coordination with the Department of Radiodiagnosis, LLRM Medical College, Meerut, in pregnant women a during 2nd and 3rd trimester.
Results- BPD & AC have a statistically linear relationship with gestational age.
Conclusion- In our study showed a significantly easy way to estimate the median values of fetal biometry at each gestational week with good reliability.

INTRODUCTION

Ultrasound measurement of fetal biometry is an important and commonly used tool in antenatal care. It measures biometric parameters such as biparietal diameter (BPD), head circumference (HC), abdominal circumference (AC) and femur length (FL). Estimated fetal weight (EFW) can be calculated based on multiple biometric parameters using established formulae [1]. It is important not only to measure fetal biometric parameters accurately, but also to interpret the results appropriately. It helps to predict or diagnose fetal health problems.

Fetal growth restriction (FGR), conventionally defined as estimated fetal weight that is less than the 10th percentile for gestational age and small-for-gestational-age (SGA), conventionally defined as birth weight less than the 10th percentile for gestational age, are conditions that have been associated with increased risk of perinatal morbidity and mortality and increased metabolic and cardiovascular disease risk in later life [2,3]. The reduction of such risk depends on improved antenatal detection and careful clinical management[4]. Various studies have demonstrated that AC and EFW are preferred parameters to diagnose FGR or predict SGA [7,8]. Below 10th percentiles of AC or EFW standards has also been recommended as diagnostic criteria by recent national clinical guidelines.[4]

MATERIALS AND METHODS

The present study was conducted in the Department of Anatomy, in coordination with the Department of Radiodiagnosis, LLRM Medical College, Meerut, in pregnant women a during 2nd and 3rd trimester.

Ultrasonographic measurement of tibial length was done in Radiodaignosis Department of LLRM Medical College, Meerut.

The present study was done in 100 pregnant women who were not sure about their menstrual period and having singleton apparently normal foetuses between 15 to 36 weeks of gestation and subjects having any medical pathology were excluded from study.

We measured the tibial length without prior knowledge of gestational age, using Medison S A 8000 S E ultrasonographic machine with curvilinear probe 3.5 to 5 MHz.

Observations

The present study was conducted in 100 pregnant women, between the age range of 18 to 40 years, during 2nd and 3rd trimester, in the Department of Radiodaignosis, LLRM Medical College, Meerut.

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Table no 1 Association between gestational age and BPD & AC

Weeks	Mean BPD (mm±SD)	Mean AC (mm±SD)
15	15.50±1.41	95.00±3.82
16	32.75±1.89	104.0±2.82
17	37.25±0.95	111.2±6.99
18	40.60±0.89	116.4±4.09
19	45.25±0.95	124.5±2.51
20	47.66±0.81	144.0±4.19
21	55.00±0.81	155.0±2.58
22	56.80±0.83	173.2±2.77
23	58.00±0.81	181.0±2.58
24	61.00±1.41	196.2±3.63
25	62.00±1.41	200.8±4.85
26	65.20±1.64	216.4±5.77
27	65.00±1.15	225.5±5.00
28	71.66±3.07	231.2±11.5
29	74.80±0.83	255.4±5.45
30	75.00±1.00	272.8±3.34
31	78.75±0.95	271.5±5.97
32	79.20±0.83	288.2±9.70
33	83.50±2.51	294.0±3.74
34	85.00±0.81	304.0±4.32
35	87.25±1.50	312.7±3.40
36	89.80±1.48	325.6±6.22

Table no 2 shows predicted values of various parameters (Independent variables like-BPD,AC and Dependent variables like –Gestational age in weeks)

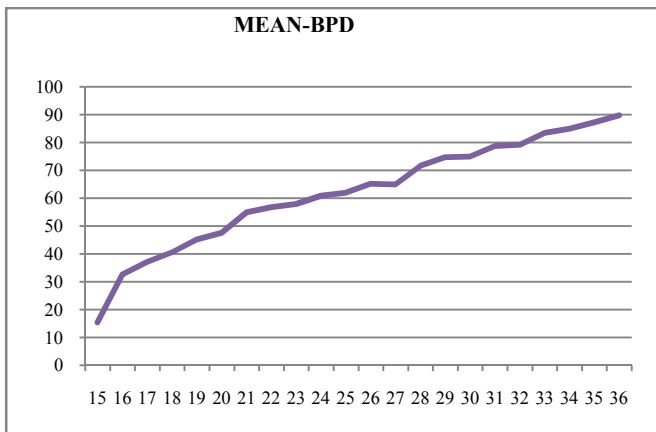| Parameters	Intercept(a)		Slope(b)		R^2	P value
	estimate	S.E	estimate	S.E		
BPD	5.440	0.315	0.323	0.004	0.949	<0.0001
AC	7.325	0.298	0.087	0.001	0.995	<0.0001

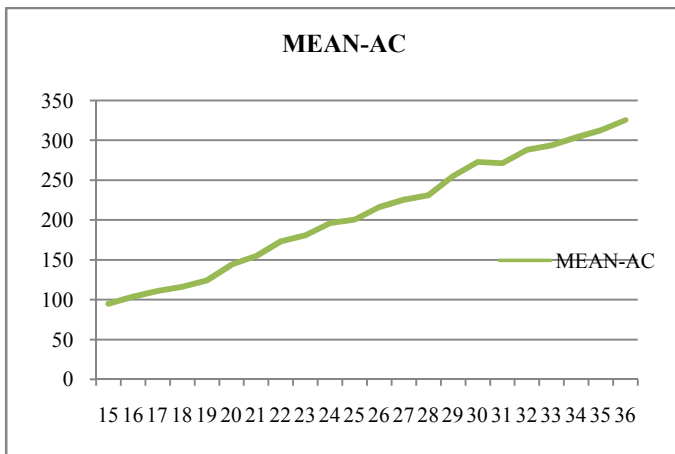**Figure no.1** shows a plot of BPD verses gestational age.

Figure no.2 shows a plot of mean-AC verses gestational age.

BPD & AC have a statistically linear relationship with gestational age.

DISCUSSION

Ultrasound assessment of gestational age has become an integral part of obstetric practice in recent times.

In the past, the biparietal diameter (BPD) had been described as a reliable method of determining gestational age. While the BPD was the first fetal parameter to be clinically utilized in the determination of fetal age in the second trimester, more recent studies have evaluated the use several other biometric parameters including head circumference (HC), abdominal circumference (AC), femur length (FL), foot length, ear size, orbital diameters, cerebellum diameter and others[1].

There have been several mathematical formulae proposed by different authors which estimate the relationship between GA and fetal biometric values[5-7]. Some authors have proposed formulae which estimate GA with measured biometric values. Yaghoobian[5]s formula estimated GA with measured BPD. Others have proposed formulae which estimate fetal biometric values according to each GA. Rosati and Guariglia[6] proposed two linear mathematical models to estimate the length of femur and humerus length using measured BPD and GA in early pregnancy. Of the three formulae, the one suggested by Rosati and Guariglia is similar in concept to our equation[7].

CONCLUSION

In our study showed a significantly easy way to estimate the median values of fetal biometry at each gestational week with good reliability.

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