



## Correlation of Gestational Age with Fetal Biparietal Diameter

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### Abstract:

Estimation Gestational age (GA) is important part of obstetric practice. Ultrasonography plays important role estimation of gestational age. Fetal biparietal diameter (BPD) is one of the parameters used for estimation of GA along with femur length, head circumference and abdominal circumference. However, the BPD was more than twice as sensitive as the femur length to variation in fetal growth. The study was performed on 300 pregnant women with an aim to correlate BPD with GA and to find out if fetal BPD can be used as a parameter to calculate the GA in pregnancy. Pregnant women with single live fetus and having no other complication either in mother or fetus were selected for the study. Fetal BPD was measured in millimeter by Philips HD 6 machine. The results were analyzed for accuracy in estimation of GA by BPD and were compared with findings of other workers. The correlation between GA and BPD was highly significant and also comparable with other studies.

**Keywords:** biparietal diameter, gestational age, fetal parameters

Abbreviations: GA- gestational age; BPD- biparietal diameter

### Introduction:

Accurate knowledge of gestational age is a keystone in the obstetrical ability to successfully manage the ante partum care of the patient and is critically important in the interpretation of antenatal test and successful planning of appropriate therapy and intervention.<sup>1</sup> Estimation of gestational age (GA) is important part of obstetric practice. Ultrasonography plays an important role in estimation of gestational age. Fetal biparietal diameter (BPD) is one of the parameters used for estimation of GA along with femur length, head circumference and abdominal circumference. However, the biparietal diameter was more than twice as sensitive as the femur length to variation in fetal growth.<sup>2</sup> In second trimester this parameter is used to estimate GA and to calculate estimated date of delivery. Many parameters are there to estimate

GA of fetus ultrasonically. But to estimate GA in decomposed fetuses in medicolegal cases is difficult. Data of other variables can be used for age estimation of fetus at autopsy. But each bone may not be present for autopsy. There are studies<sup>3,4</sup> giving data for estimation of gestational age, but are on foreign population. So this study was done to collect data of fetal BPD ultrasonically in pregnant women from western Maharashtra and correlate it with known GA.

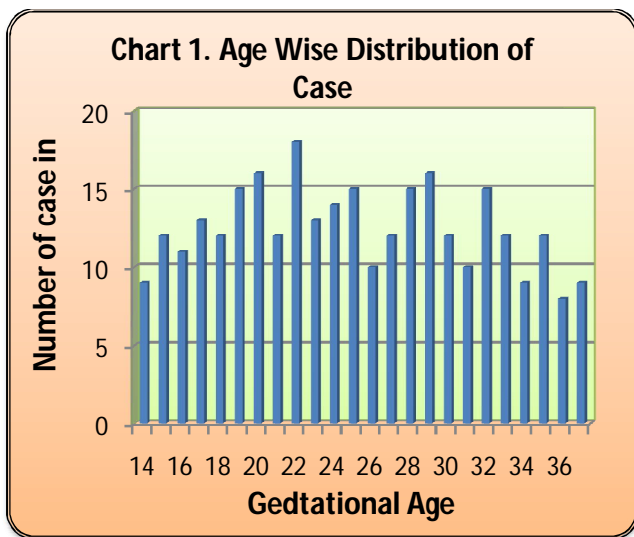
### Material and Method:

The study was conducted on 300 pregnant women, maternal age between 19-35 years who came for ultrasonography in the Mamta Nursing Home, Miraj Dist Sangli Maharashtra in between November 2015 to September 2016. Only women with known

gestational age from last menstrual period and between 14 weeks to 37 weeks of gestation were included in this study. All patients were examined for any other complication. Gravid females with single live fetus, with regular menstrual cycles, known date of last menstrual period, previous live normal neonates in multipara, no history of drug abuse and taking tobacco, diabetes, hypertension, tuberculosis and without any congenital anomaly were selected. All scans were performed by a single ultrasonologist on one ultrasound machine, Philips HD 6. Statistical analysis was conducted.

**Observation:**

The study was conducted in 300 women with maternal age was between 19-35 years with a mean maternal age of 23.5. Women between 14 weeks to 37 weeks were included in this study. Number of women’s in different gestational age is shown in chart 1.

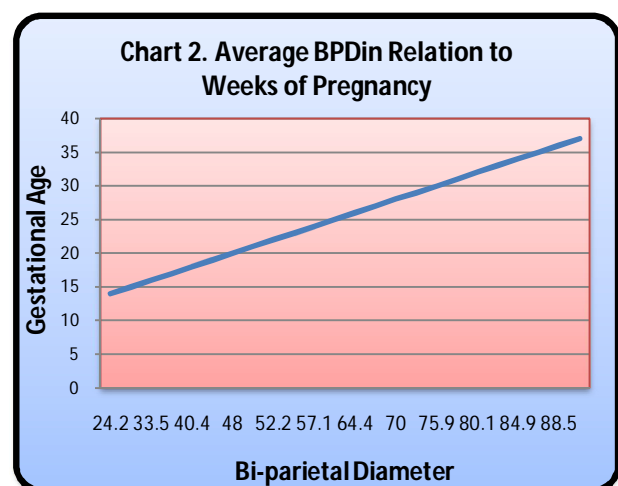


Fetal BPD was measured by ultrasound in millimetre. Average BPD for given gestational age was calculated as seen in table 1. It was observed that BPD was 24.5 mm at 14 weeks GA and 90 mm in the 37 weeks. The fetal BPD increases with increase in gestational age.

**Table 1. Showing average BPD in mm at different GA**

Gestational Age From LMP	Bi-parietal Diameter(mm)
14	24.2
15	30.5
16	33.5
17	36
18	40.4
19	46.9
20	48
21	50.5
22	52.2
23	55.1
24	57.1
25	63
26	64.4
27	69.9
28	70
29	72.5
30	75.9
31	78.9
32	80.1
33	83.2
34	84.9
35	87.8
36	88.5
37	90

From the data in table 1, linear graph is plotted as seen in chart no. 2

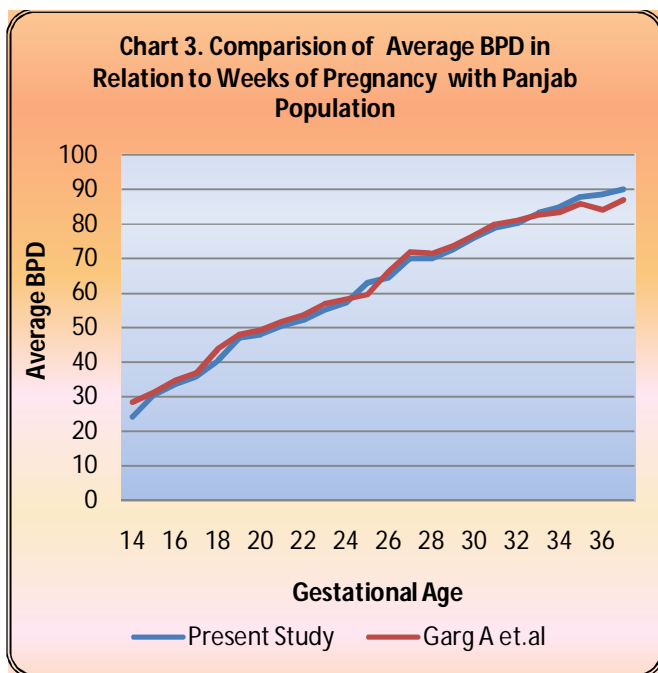


From above graph, it is observed that average BPD shows linear growth with increase in gestational age.

From the data correlation coefficient was calculated. The correlation coefficient was found to be 0.9940. The regression equation was derived  $Y = 3.8632 + 0.35 * X$  where Y is Gestational age, X is BPD.

### Discussion:

In our study of 300 cases with known gestational age from LMP between 14-37 weeks of gestation were selected. Chart 1 shows the details of number of cases in each age group. BPD was measured ultrasonically and average BPD for age group was calculated. It is presented in Table 1. From the data in table 1, linear graph is plotted as seen in graph no. 2. The BPD shows linear growth with increase in gestational age. This data is compared with data given by Garg et al<sup>5</sup> and presented in chart 3.



From chart both study shows linear growth in BPD with GA. The correlation coefficient and regression equation was derived. The correlation coefficient was 0.9940 and it is highly significant. The regression equation was derived  $Y = 3.8632 + 0.35 * X$  where Y is Gestational age, X is BPD. From this by measurement of BPD we can determine approximate GA in decomposed fetuses in medicolegal cases.

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