

ULTRASONIC BIPARIETAL DIAMETER IN INDIAN WOMEN

by

(MRS.) P. R. VAIDYA

G. S. RAO

MEDHEKAR

and

S. C. SHAH

SUMMARY

Ultrasonic 'biparietal' foetal skull diameter' (BPD) was assessed in 75 women, using real time gray scale. BPD/8 cms denotes a gestational age of 32 weeks or lower and BPD of 9 cms or more means foetal maturity more than 38 weeks but BPD 8.5-8.9 cms means a gestational age of 30-38 weeks. Therefore, serial biparietal diameters in later weeks of pregnancy is useful in assessing foetal growth and maturity to a certain extent.

Introduction

Foetal maturity is often a problem in a developing country like ours where the women do not exactly remember the last date of menstruation (L.M.P.). Measurement of biparietal diameter (BPD) by ultrasonography will predict gestational age to within \pm one week provided that it is obtained before 24th week of pregnancy. It is widely accepted that the estimation of gestational age from a single measurement of BPD obtained after 32nd week of gestation is not sufficiently accurate to be of any clinical value. (Bennett 1980). However, most of our antenatal women attend the clinic only after 28 weeks of pregnancy. Besides the BPD of Indian antenatal population is not widely studied. We have made an attempt to estimate the biparietal

diameter of our antenatal women to establish the norms in our population and to study whether any clinical usefulness can be attributed to this measurement in our circumstances.

Material and Methods

Women attending the antenatal clinics or women admitted to the antenatal wards for false pains or postmaturity etc. were examined by real time gray scale ultrasonic machine using 1500 m/Secs as velocity. Period of gestation was derived from the date of last menstrual period. BPD measurements were repeated at weekly interval whenever possible.

The period of gestation was varying from 25 to 42 weeks. The age of the patient was 20-25 years in 65 women (69%), 26-30 years in 23 women (24.4%) and 31 to 35 years in 6 women (6.37%). The parity of the patients was primigravidas in 45 women (47.8%), primiparas in 28

From: L.T.M.G. Hospital & L.T.M.M. College, Dept. of Obstet. & Gynec., Sion, Bombay-400 022.

Accepted for publication on 8-8-85.

women (30%) and 21 women (22.3%) were IInd to IVth paras. In all 104 observations were performed on 94 women.

Results

Table 1 shows the biparietal diameter at varying weeks of gestation and its comparison with the composite readings quoted by Sabbagha (1979). The composite Table is derived by Sabbagha from the mean diameters of 4 series studied by Sabbagha *et al* (1976) Campbell and Newman (1971), Levi and Smets and Varma using outer inner diameter by B-Scans or B-A scans using non persistent image scanning at a velocity of 1540 m/Secs.

TABLE I
Comparison of BPD With the Composite Reading BPD (CM)

Weeks gestation	Present series	Composite mean BPD
25	6.8	6.4
26	7.0	6.7
28	7.7	7.2
30	8.2	7.8
32	8.4	8.2
34	8.5	8.7
36	8.8	9.0
38	9.2	9.3
40	9.4	9.4
42	9.2	9.5

Graph I shows the actual charting of the biparietal diameter at different weeks of gestation.

Following conclusions could be drawn from this study:

- (i) BPD < 8 cms denotes a gestational age of 32 weeks or lower.
- (ii) BPD between 8-8.5 cms denotes a gestational age more than 28 weeks of pregnancy.

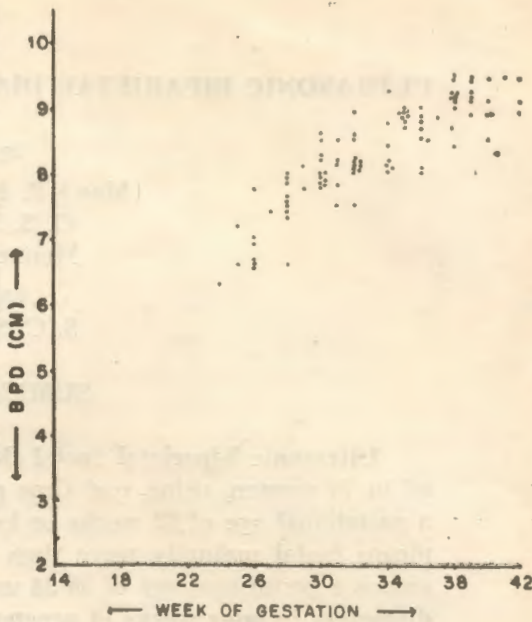


Fig. 1

BPD AND COMPARISON WITH THE COMPOSITE READING

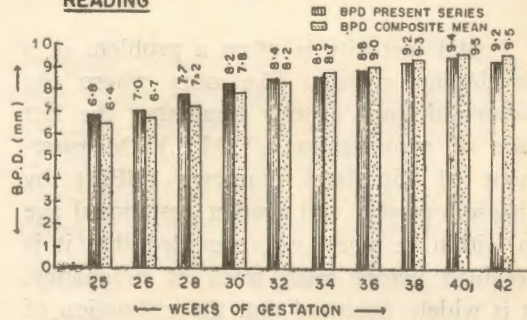


Fig. 2

(iii) BPD 8.5 to 8.9 cms means a gestational age of 30-38 weeks.

(iv) BPD of 9 cms or more means that the foetus is mature and is more than 38 weeks.

Discussion

Measurement of BPD, Head and abdominal circumference is more accurate by static B-Scan methods in experienced hands

and serial weekly or biweekly measurements to assess foetal growth are ideally made by this method in late pregnancy. Under normal circumstances foetal growth is slow at this time and its measurement must be performed by the most precise method available (Campbell and Little 1980). However, since the advent of gray scale and real time imaging the use of B mode for cephalometry has declined sharply. (Sabbagha) Real time has the advantage of ease and speed of operation and is good for antenatal screening (Meire 1980). All the reliable charts relating to foetal age and growth were derived by B mode technology. Increased width of skull echoes are produced by real time and gray scale apparatus and are attributed to the high gain settings used in this equipment. (Sabbagha. Hughey and Sabbagha 1978 controlled the width of BPD skull tables by varying the gain settings. The difference among all the outer-inner BPDs was not statistically significant with the different scanning modelities if the width of each skull table shown on gray scale or real time photographs was within 3-5 mms. Hughey and Sabbagha have quoted a gain of ± 0.8 to ± 1.54 mm with gray scale real time imaging.

According to Sabbagha standard biparietal charts for universal use are possible and highly desirable. There is a uniformity in gestational age and foetal growth. Sabbagha *et al* have quoted a marked similarity in BPD measurements for the black and caucasian women at 20-40 weeks gestation. He has also quoted that the variation in gestational age derived by the biparietal diameter can be ± 7 days at 16 weeks, 10-11 days at 17 to 26 weeks and 21 days at 27 to 40 weeks, of gestation. Addition of abdominal circumference to the BPD will be a useful check on BPD

predictions and adds confidence to the assessment.

Our BPDs are higher than the composite means of Sabbagha upto 32 weeks of gestation and are lower than the composite mean from 34 weeks of gestation. This means a comparatively slower foetal growth in the later weeks of gestation. However this is only a preliminary data and many more estimations should be done for the final conclusions.

We conclude that serial biparietal diameters even in the later weeks of pregnancy is useful in (1) Assessing the foetal maturity to a certain extent. (2) To assess the foetal growth. (3) To pick up cases of IUGR. (4) To accidentally detect foetal skull abnormalities.

References

1. Bennett, M. J.: Real time ultrasound in the Second and third trimester of pregnancy in Real time ultrasound in Obstetrics by Bennett, M. J. and Campbells Blackwell scientific publications. London P. 83, 1980.
2. Campbells and Newman, G. B.: J. Obstet. Gynec. Brit. C'wealth., 78: 513, 1971.
3. Campbell, S. and Little, D. J. (1980): Clinical potential of real time ultrasound P. 34-37, 1980, Blackwell Scientific Publications (same as ref. 1).
4. Hughey, M. E. and Sabbagha, R. E.: Am. J. Obstet. Gynec., 131: 825, 1978.
5. Levi, S. L. and Smets, P.: Acta Obstet. Gynec., 52: 193, 1973.
6. Meire, H. B.: The future of real time ultrasound in Obstetrics, P. 134-141, 1980. Blackwell Scientific publications (same as ref. 1).
7. Sabbagha, R. E.: Ultrasound in high risk obstetrics, Lea & Fesiger, Philadelphia, P. 16-25, 1979.
8. Sabbagha, R. E., Barton, F. B. and Barton, B. A.: Sonar biparietal diameter. Am. J. Obstet. Gynec., 126: 479, 1976.
9. Varma, T. R.: Prediction of Delivery date by ultrasound cephalometry, Journ. of Obstet. Gynec. Brit. C'wealth., 80: 316-319, 1973.