ULTRASONIC BIPARIETAL DIAMETER AND ITS CORRELATION WITH FOETAL WEIGHT IN INDIAN WOMEN

(Analysis of 100 cases)

By

MAYA SOOD AND RENU TEWARI

SUMMARY

Ultrasonic Biparietal Fetal skull diameter (BPD) in uterus was measured in 100 cases of normal pregnancy at term or in early labour using A.D.R. Ultrasound Sector/Linear real time scanner. Weight of the newborn was recorded and it was correlated with BPD. Maximum cases belonged to B.P.D. range 8.8 cm to 9.1 cm. All cases with BPDs of 8.8 cm, 9 to 9.2 cm, 9.4 cm and above were found to be consistent with fetal weight of more than 2.0 kg, 2.5 kg and 3 kg respectively.

Introduction

Prediction of birth weight in utero has proved to be useful especially in the management of high risk pregnancy and intrauterine growth retardation. There are various methods for estimation of fetal weight. In late 1950s and early 1960s ultrasound became an important non-invasive tool for estimation of various fetal parameters, notably biparietal diameter. In present study ultrasonic biparietal fetal skull diameter (BPD) in utero was measured at term and it was correlated with the fetal weight at birth.

Material and Methods

This study included 100 cases of full term pregnancy including those in early labour, having single fetus, presenting as vertex, delivered within 72 hours of BPD measurement and had no congenital malformation an ADR—Ultrasound Sector/ Linear Real time scanner was used and, biparietal fetal skull diameter in utero was measured.

The transducer was moved along the direction of the fetal spine towards the head, thereafter the transducer was suitably adjusted till the image of the head appeared as an ovoid bisected by a broken mid line echo of falx-cerebri.

Pulsation of the middle cerebral artery, thalamic shadows and shadows of the lateral ventricles could be seen on either side of the falx in this plane of the head. The upper and lower tables of the head were of equal thickness and the third ventricle could be seen 1/3 of thickness from the sinciput. The image was freezed with the freeze button and

From: Deptt. of Obstet. and Gynaec., MAMC College and associated LNJP Hospital, New Delhi.

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largest diameter perpendicular to the falx echo was measured with electronic calipers fitted in the machine. Measurements were taken from the outer aspect of the upper skull table to the inner aspect of the lower skull table. Three readings were taken with different images and the largest reading consistent with a good image was taken as the BPD. Biparietal diameter was measured and its correlation with fetal weight at birth was recorded.

Observations

Maximum no. of cases, 50% belonged to BPD range of 8.8 to 9.1 cm only 3% cases had BPD of 9.4 cm.

98% of cases in BPD range 8.8-9.1 weighed $\geqslant$ 2.5 kg and 58% in this range weighed $\geqslant$ 3 kg. All cases with BPD 9.2-9.3 cm weighed more than 2.5 kg whereas all cases with BPD 9.4 cm weighed more than 3 kg.

TABLE I
Distribution of Fetal Biparietal Diameter (BPD)

BPD (cm)	No. of cases	No. of cases with fetal weight $\geqslant$ 2.5 kg (%)	No. of cases with fetal weight $\geqslant$ 3.0 kg (%)
8.0-8.3	13	9 (69.23)	1 (7.7)
8.4-8.7	20	15 (7.50)	5 (25.0)
8.8-9.1	50	49 (98)	29 (58)
9.2-9.3	14	14 (100)	10 (71.43)
9.4	3	3 (100)	3 (100)

TABLE II
Fatal Weight in Relation to BPD

BPD (Cm)	Number of cases (%)					Total
	Upto 2000	2001-2500	2501-3000	3001-3500	3500	
8.0-8.3	1 (7.69)	6 (46.15)	5 (38.46)	1 (7.69)	—	13 (100)
8.4-8.7	2 (10.0)	5 (25.0)	8 (40.0)	4 (20.0)	1 (5.0)	20 (100)
8.8-9.1	—	9 (18)	20 (40.0)	21 (42.0)	—	50 (100)
9.2-9.3	—	—	5 (35.71)	5 (35.71)	4 (28.57)	14 (100)
9.4	—	—	—	2 (66.67)	1 (33.33)	3 (100)

No fetus with a BPD of 8.8 cm and above weighed less than 2 kg. Similarly all fetuses with BPD 9.2 cm and above weighed > 2.5 kg and those with BPD 9.4 cm weighed > 3 kg.

Discussion

Various workers have correlated fetal weight with BPD. According to Willock and Donald (1964) 80% of cases with BPD 9 cm and above weighed ⩾ 2.77 kg, whereas according to Kohorn (1967) 82% of cases with BPD 9 cm weighed > 3 kg.

In present study all cases with BPD 9.0 cm and above weighed ⩾ 2.5 kg. Similar results have been reported by Verma (1974).

In the study conducted by Willock and Donald (1964) with BPD of 8.5 cm and above 80% of cases weighed ⩾ 1.816 whereas according to Kohorn (1967) 96% of cases with BPD 8.5 cm weighed 2.15 kg as compared to present study where 83.33% of cases with BPD with 8.5 cm weighed 2.5 kg.

The Table given below gives the comparison of correlation of BPD with fetal weight in various studies done previously and the present study.

According to Subbagha and Turner (1972) 97.5% cases with BPD 9.4 cm weighed 2.5 kg and above as compared to the present study where all cases with BPD 9.4 cm weighed ⩾ 3 kg. Verma (1974) found that a SPD of 9 cm was consistent with a weight of 2.500 gm or above, whereas when it was below 9.0 cm the birth weight varied above and below 2,500 gm. According to Stocker *et al* (1975) with a BPD of 8.7 cm or more baby weight in all cases exceeded 2500 gm, and ninety per cent of new born babies with BPD of 9 cm or more weighed more than 3000 gms. Subbagha and Turner (1972) noted that it is highly improbable for a fetus with a BPD of 9.4 cm to weight less than 2500 gm. This is in contradiction to Iannirubertо (1971) who reported that no fetus with a BPD of 8.7 cm weighed less than 2500 gm. They postulated these differences may be

S. No.	Authors	Weight attained (gms)	BPD (cm)	Percentage cases
1.	Willock and Donald (1964)	1816	8.5	80
		2277	9.0	80
2.	Kohorn (1967)	2500	8.5	96
		3000	9.0	82
3.	Iannirubertо and Gibbons (1971)	2500	8.7	100
4.	Sabbagha and Turner (1972)	2500	9.4	97.5
5.	Varma (1974)	2500	9.0	100
6.	Stocker *et al* (1975)	2500	8.7	100
		3000	9.1	90
7.	Present study (1986)	2500	8.5	83.33
		2000	8.8	100
		2500	9.0	100
		2500	9.2	100
		3000	9.4	100

related to inherent population variables and non standardisation of methodology.

In present study BPD showed a good correlation with fetal weight.

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