

# ESTIMATION OF FETAL WEIGHT BY ULTRASONIC PARAMETERS

(An Experience with Warsof's Equation)

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## SUMMARY

Accurately estimated fetal weight can significantly affect management decisions in labour. Our experience with Warsof et al formula for estimation of fetal weight shows an accuracy of prediction of  $\pm 92.84$  gms./kg birth weight which is highly significant. A more accurate method of fetal weight prediction using multiple fetal parameters can find a wider application in management decisions in labour.

### Introduction

Accurate estimation of fetal weight can have a significant bearing on the management decisions in labour and can improve the perinatal out-come significantly. In cases of preterm labour with inaccurate estimation of fetal weight a potentially salvable fetus may die if it is assessed to be too small for aggressive management of distress in utero or on the other hand caesarean section may be performed on a fetus which has no reasonable chance of survival. Large fetuses weighing more than 3500 gms if identified accurately and presenting by breech will be better served by caesarean section. A significant discrepancy among the weights of the two fetuses in twin pregnancy, with the larger second fetus presenting by breech will favour decision for an abdominal delivery. An accurate prediction of fetal weight will

help in prediction of IUGR fetuses at an early period of gestation.

The various clinical methods of estimation of fetal weight are indirect and depends on external measurements which are more frequently affected by variables other than fetal weight.

With improvements in real time grey scale ultrasonography, now it has become possible to accurately measure various fetal parameters and estimate the fetal size and weight directly. Various fetal parameters have been used by different workers to estimate fetal weight.

An account of our experience with the formula Est. Fetal weight =  $-1.7492 + 0.166(\text{BPD}) + 0.46(\text{AC}) - 2.646(\text{AC} \times \text{BPD})/1000$  using BPD and Abdominal Circumference (AC) follows.

### Material and Methods

101 mothers admitted to Safdarjang Hospital for delivery were picked up at random and scanned ultrasonographically.

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Those who did not deliver within 48 hours of the scanning were excluded from the study.

BPD was measured as the largest diameter between the outer and inner tables at right angles to the falx at a plane slightly above and parallel to the canthomeatal line which included falx thalamus, septum pellucidum and an oval head shape.

A plane at right angles to the long axis of the fetus showing the liver, the junction of umbilical vein and ductus venosus, and the stomach bubble was selected for measurements of abdominal circumference. Antero-posterior and transverse diameters at this plane were measured and their average obtained. AC was calculated as the circumference of a circle by multiplying the average diameter by Using the table of estimated fetal weight and cross referring the BPD and AC the fetal weight was determined.

The results obtained are shown in Table I and Fig. 1.

TABLE I

Accuracy of fetal weight prediction for different weight categories

Weight category	No of patients	SD/Kg birth weight
Less than 2000 gms.	10	105.44 gms.
2001 gms. to 2500 gms.	30	102.19 gms.
2501 gms. to 3000 gms.	48	85.03 gms.
3001 gms. and above	13	87.29 gms.
Over all	101	92.84 gms.

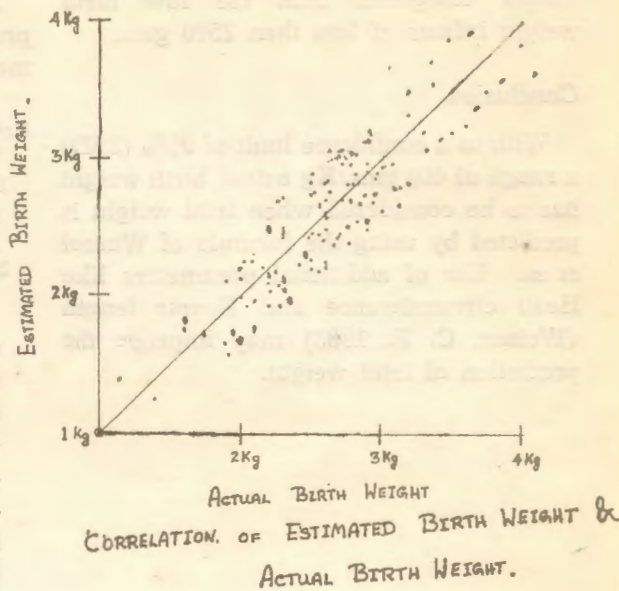


Fig. 1

#### Discussion

The accuracy of prediction of fetal weight in our present study was  $\pm 92.84$  gms (1SD) per Kg of actual birth weight, which is not significantly different from the one reported by Warsof *et al.*

When the mothers turned up late in labour with a deeply engaged head it was difficult to measure the BPD accurately.

With rupture of membranes and escape of liquor, accurate demarcation of fetal abdomen from the surrounding uterus and placental tissue was difficult and hence the AC measurements became less accurate.

Analysing the accuracy of prediction for different weight category of actual birth weight, it was found that the fetal weight was more accurately predicted for higher



weight categories than the low birth weight infants of less than 2500 gms.

Conclusion

With in a confidence limit of 95% (2SD) a range of 400 gms/Kg actual birth weight has to be considered when fetal weight is predicted by using the formula of Warsof *et al.* Use of additional parameters like Head circumference and Femur length (Weiner, C. P. 1983) may improve the prediction of fetal weight.

A more accurate method of fetal weight prediction can find a wider application in management decisions in labour.

References

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