

Estimated fetal weight: a comparison between Hadlock and Bouton/Denhez/Éboué formulas

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Objective

To evaluate the accuracy of Bouton/Denhez/Éboué and Hadlock formulas using ultrasound (US) in the estimation of fetal weight for term pregnancies compared to the actual birth weight.

Methods

Present study was a single-center, prospective, comparative study, conducted in department of Obstetrics & Gynecology A, at Charles Nicolle hospital in Tunisia between February 2023 and April 2023. All of the ultrasounds were performed by the same operator. Inclusion criteria: patients attending antenatal clinics and maternity ward; a singleton pregnancy; cephalic presentation; the same day US assessment prior to delivery; delivered at our hospital; consented for participation. Exclusion criteria: patients with multiple gestation; abnormal volume of amniotic fluid; fibroids; known fetal malformations. The study was explained to the participants. Fetal weight estimation using Hadlock's formula and Bouton/Denhez/Éboué's formula using USG was performed for every participant. Biparietal diameter (BPD), abdominal circumference (AC), transverse abdominal diameter (TAD) and femur length (FL) were measured in centimeters, then the sonography machine calculated fetal weight using these two formulas: The Hadlock's formula: $\text{Log}_{10}(\text{EFW}) = 1.335 + 0.0316 \times \text{BPD} + 0.0457 \times \text{AC} + 0.1623 \times \text{FL} - 0.0034 \times \text{AC} \times \text{FL}$ The Bouton/Denhez/Éboué's formula: $2\text{EFW} = [\text{BPD}]^{0.972} \times [\text{TAD}]^{1.743} \times [\text{FL}]^{0.367} \times 10^{(-2.647)}$ Pearson's correlation coefficient (R) was used to determine if there was a significant relationship between the estimated birth weight and the actual birth weight. P value less than 0.5 was considered as statistically significant.

Results

20 women were included in this study. Mean age of participants was 26.7 ± 3.2 year. The mean actual birth weight was $3147.6 \text{ g} \pm 223 \text{ g}$. The mean birth weight by Hadlock's formula was $3387.9 \text{ g} \pm 258.5 \text{ g}$. ($P < 0.00001$). The mean birth weight by Bouton/Denhez/Éboué's formula was $2907.27 \text{ g} \pm 234.6 \text{ g}$ ($P = 0.6$). The average error was less when using Hadlock's formula (240.3 g) than when using Bouton/Denhez/Éboué's formula (240.3g). There was a strong positive correlation between the Hadlock's formula and actual birth weight ($R = 0.98$). There was a weak correlation between the Bouton/Denhez/Éboué's formula and actual birth weight ($R = 0.164$).

Conclusion

Hadlock's formula seems to be a better ultrasound formula for estimating fetal weight at term.