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Accuracy of sonographic fetal weight estimation near delivery

Grau L, Hurtado I, Zientalska A, Velasco I, Comas C
Hospital Germans Trias i Pujol, Badalona, Spain

Objective

To evaluate the accuracy of sonographic fetal weight estimation near delivery and identify influencing factors.

Methods

Retrospective review including all singleton gestations with a growth scan performed within 14 days of delivery, by 19 experts in fetal medicine, from June 2019 to November 2021 at our tertiary centre. Fetal biometry measurements were used to calculate estimated fetal weight (EFW) according to the Hadlock IV formula. We excluded cases with fetal anomalies. Data recorded included maternal characteristics, gestational age (GA) at scan and at delivery, EFW, fetal presentation, amniotic fluid index (AFI), mode of delivery, birthweight, Apgar score and neonatal intensive care unit admission.

Results

Of 1207 cases included, there were 690 fetuses (57.2%) for whom birthweight was underestimated and 515 (42.7%) with overestimated birth weight. Mean gestational age at ultrasound examination was 38.3 ± 2.5 weeks and the mean time interval from the scan until delivery was 4.9 ± 3.6 days. The mean birthweight was higher than the mean EFW (3129.2 ± 685.6 g compared with 3061 ± 681.6 g, respectively), with the systematic error having a mean of 7.7 ± 6.2 %. When analysed by gestational age, mean percentage error was higher in preterm fetuses compared to term fetuses (9.3 ± 7.1 vs 7.2 ± 5.8 %, p<0.001), with greater tendency for underestimation in preterm cases (p=0.003). The accuracy of fetal weight estimation decreased gradually with increasing distance in days between the scan and delivery. Specifically, the accuracy of EFW was significantly better when ultrasound was performed within 7 days prior delivery (p<0.001). No statistically significant difference was observed in the accuracy of fetal weight estimation between fetuses with normal EFW and fetuses identified as small for GA (SGA) or large for GA (LGA). Fetal presentation and AFI were not found to be associated with sonographic EFW inaccuracies.

Conclusion

Accuracy of sonographic fetal weight estimation was correlated to GA and to the time at ultrasound with a significant better accuracy when ultrasound was performed closer to delivery. There is a tendency for underestimation of the EFW, regardless of the fetal parameters included.

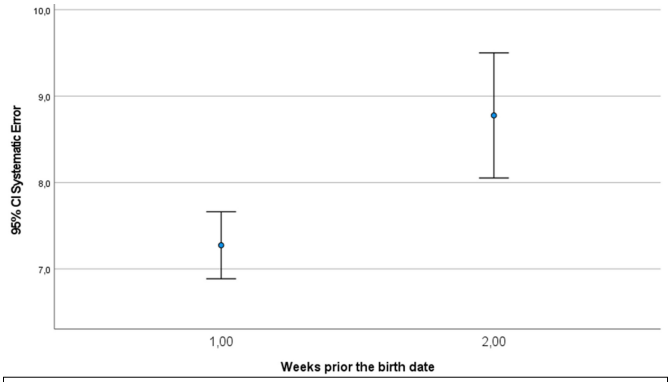

Figure 1. Systematic error in fetal weight estimation according to the weeks between the scan and delivery.

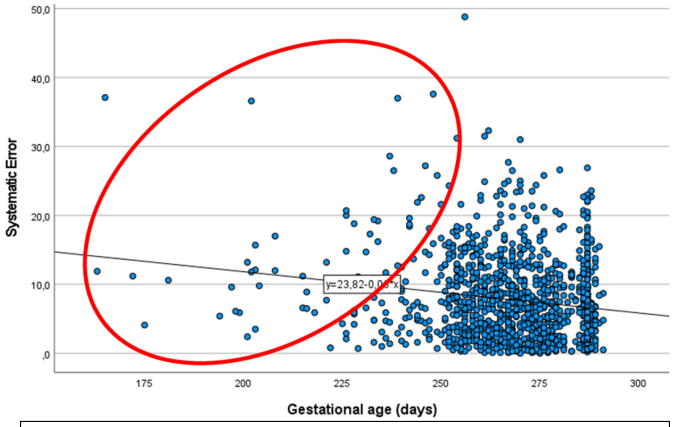

Figure 2. Scatter plot of gestational age and systematic error.