

Reproducibility of ultrasound fetal Dopplers in fetal growth assessment

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Objective

To assess reproducibility of ultrasound fetal Dopplers for commonly used blood flow assessment in fetal growth.

Methods

Women with singleton normal pregnancies were recruited at University College London Hospital, UK between 24 and 41 weeks to ensure equal distribution among gestational weeks. Fetal umbilical (UA), Middle cerebral artery (MCA) and their pulsatility indices (PI) ratios such umbilical cerebral (UCR) and cerebro-placental ratio (CPR) were obtained twice by sonographers in training or after completion of training, blind to each other. Bland-Altman plots were generated and mean and 95% confidence intervals (CI) for intra- and interobserver reproducibility were calculated. Values were expressed as absolute PI or resistance indices (PI and RI) and as z-score. Power calculation required to include 100 women.

Results

110 women were recruited. Overall reproducibility was good for absolute values, however poor for z-score impact. 95%CI were to 0.73 PI for MCA and 0.3 for UA, and 0.95 and 0.26 for CPR and UCR respectively. In terms of z-score 95%CI were up to 1.94 for UA, 2.05 for CPR and 0.97 for UCR. Reproducibility was higher for intra- than for interobserver variability.

Conclusion

Overall fetal Doppler reproducibility was acceptable but led to a significant variability in terms of z-score which could generate normal and abnormal results only due to reproducibility intervals. UA and UCR are the most reproducible measurements which should be recommended for clinical use.