

Comparison between aortic isthmus (AoI) Doppler and cerebro-placental ratio CPR in FGR

Objectives

Doppler monitoring of FGR fetuses is important to detect hemodynamic decompensation. In this study; we compared fetal aortic isthmus pulsatility index (AoI-PI) and cerebroplacental ratio (CPR) to predict neonatal outcome in FGR.

Methods

This study is a cohort prospective study to compare the sensitivity and specificity of CPR and AoI-PI in FGR fetuses as predictors for neonatal intensive care unit (NICU) admission. We had studied 47 cases with FGR (between : 28-36 weeks). To calculate the CPR; we had interrogate umbilical artery (UA) at a free loop and middle cerebral artery (MCA) at the proximal near-field. $CPR = \text{MCA PI} / \text{UA PI}$. Then we interrogated the fetal AoI at the sagittal plane of the aortic arch 3 mm caudal to the left subclavian artery. Assessment done by two sonographers in the same visit that was within two days of delivery. We had compared the duration and difficulty of sampling in the cases. After delivery cases were assessed as regard the Apgar score at 5 minutes and NICU admission.

Results

62% of our cases had been admitted to the NICU. Sensitivity of CPR and AoI-PI for prediction of NICU admission were 54.43% and 42.45% respectively. Specificity of CPR and AoI-PI for prediction of NICU admission were 67.98% and 61.78% respectively. 71% of cases with abnormal CPR and 57% of cases with abnormal AoI-PI were had Apgar score less than 7 at 5 minutes. The interobserver intraclass correlation coefficient (ICC) for AoI sampling was higher than that of CPR (0.84 and 0.71 respectively). Average duration of AoI-PI calculation was lower than that of CPR. Most cases were technically easy, but difficulty were reported for CPR more than AoI (19% and 12% respectively).

Conclusions

Low CPR and high AoI-PI are both correlated with 5 minutes Apgar score and NICU admission in FGR fetuses. Though the specificity and sensitivity of CPR were higher than that of AoI-PI for prediction of NICU admission, the inter-observer variability for AoI-PI was lower than that of the CPR. Nevertheless, AoI sampling and interpretation were faster and technically easier than that of CPR. More studies are needed for aortic isthmus Doppler velocimetry before including it in the algorithm of monitoring of FGR fetuses.

