Middle cerebral artery Doppler improves risk stratification of SGA babies at a peri-viable gestation

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DEATH AND SEVERE MORBIDITY IN ISOLATED PERIVIABLE SMALL-FOR-GESTATIONAL-AGE FETUSES

By Meler et al

Descriptive title:

Middle cerebral artery Doppler improves risk stratification of SGA babies at a peri-viable gestation

Mini-commentary by Lawrence Impey

Small for gestational age (SGA) babies identified before 26 weeks are a heterogenous group but the largest contributor is 'isolated' SGA'. Most are 'constitutionally' small, but placental issues are common. Traditionally, the ultrasound Doppler parameters used to identify the most at risk are the umbilical artery (UA) and uterine artery (UtA). This paper (Meler et al, BJOG, 2022) challenges the dogma that MCA Doppler in early onset-SGA babies is of limited use, reporting an 87% detection rate for a 14% false positive rate for UA and MCA together in predicting a severe composite adverse outcome (CAO).

The analysis uses Doppler findings at referral, thereby reducing but not eliminating the 'intervention paradox', common to many analyses, whereby an 'abnormal' finding's association with an outcome is altered because it leads to intervention.

The group is defined by local centiles and only comprises those referred but, by including both apparently FGR and SGA babies, is less subject to selection bias. Because of the high risk nature and size of this cohort, the frequency of adverse outcomes is adequate for analysis of a severe CAO (20.4%), of death (15.4%) or long term morbidity that is sufficiently serious and includes postnatal follow up (minimum 9 months).

The role of MCA Doppler with placental failure is poorly understood. Near term, as part of the cerebro-placental ratio (CPR), it helps identify the at-risk SGA baby (Veglia et al, UOG, 2018), and even some at-risk normally grown babies. Earlier, however, the role of UA Doppler is clear (Alfirevic et al, Cochrane, 2017). That MCA Doppler adds predictive value at diagnosis is important because it will allow enable more appropriate counselling, follow up and potentially better timing of iatrogenic birth.

What does the analysis make of UtA Doppler and the ductus venosus (DV)? It is surprising (Allen et al, UOG 2016) that the former was not predictive, but as its role is well established, this could be the subject of intervention bias. Mild abnormalities (PI>95th c) of the DV were not useful, but severe ones, occurring late in the deterioration in FGR, will still be useful to time iatrogenic birth (Lees et al, Lancet, 2015).

MCA Doppler in referred small peri-viable babies improves risk stratification, a process central to maternity care. The 'checklist' approach to risk must be replaced by models using continuous variables (as opposed to cut offs of 'abnormal') of multiple independent risk factors: as with aneuploidy screening. Only then can we better identify high risk (sensitivity) whilst not over-medicalising pregnancy (specificity). Developing

this is complex, not least because of the rarity and gestation-dependence of serious perinatal events and because of the presence of the intervention paradox in large datasets. Nevertheless, the Tommy's app (https://www.tommys.org/) is a welcome start. Such screening is likely to need to be staged, and this analysis demonstrates one risk factor potentially worth including following a 20 week scan.