Doppler deterioration in intrauterine growth restriction: Unterscheider et al

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The article below summarizes a roundtable discussion of a study published in this issue of the Journal in light of its methodology, relevance to practice, and implications for future research. Article discussed:


Much research has focused on whether, over time, Doppler ultrasound can document a predictable sequence of deterioration in maternal and fetal blood vessels in intrauterine growth restriction (IUGR). This month, Journal Club members discussed a study that examined the prognostic value of interrogating multiple blood vessels rather than just the standard umbilical artery (UA) imaging. Unterscheider and colleagues accumulated 7769 data points from 1116 fetuses to determine if, in fact, a dominant pattern of vessel decline exists. Identification of such a pattern could be helpful in determining an ideal time for delivery. They believe their findings say much about the natural course of Doppler changes in individual fetuses with IUGR and that the data can serve as a foundation for future intervention trials.

**Five-point assessment**

Unterscheider et al designed the PORTO study, which enrolled 1200 women carrying a fetus with IUGR. Doppler measures—umbilical artery, middle cerebral artery (MCA), ductus venosus, aortic isthmus, and myocardial performance index—were performed at a minimum of every 2 weeks until delivery, along with evaluation of amniotic fluid volume and biophysical profile scoring. The information from the Doppler results was made available to the treating physicians.

After examining the data, the investigators found that the progression of blood vessel deterioration, as documented by Doppler ultrasound, varies among patients, and no predominant pattern was evident. In addition, the single best predictor of adverse neonatal outcomes was an abnormal UA Doppler image. It captured 86% of all noted adverse outcomes. An abnormal MCA Doppler image was the next most useful test, detecting 51% of adverse outcomes. The investigators stated that using significant time and effort to seek other Doppler abnormalities would likely detect a “relatively small proportion” of additional adverse outcomes.

**An important contribution**

Journal club participants agreed that the study had several strengths. First, the study’s multicenter model adds to its generalizability. Second, training of the sonographers and quality assurance in reviewing the Doppler results was outstanding and fortified the internal validity of the study. Specifically, sonographers were trained at the start of the study and images were frequently reexamined. A single sonographer was assigned to study participants at each site. Sonographers at all sites used the same equipment.

Participants also felt that the sample size generally allowed for a robust assessment of Doppler sequences over time. Two potential limitations were noted. While this was a multicenter study, all sites were in Ireland, which may limit the generalizability of the study. The other issue raised was that the main analysis was principally descriptive. Journal Club members thought other methods might be available to test some specific hypotheses.

With these strengths and limitations in mind, participants noted that this study is an important contribution; one that questions the utility of additional Doppler measures. Clearly, more research is needed on this complex and common issue in obstetrics.