Effect of method of assessment and training on reproducibility of uterine artery Doppler

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Objective

To 1) evaluate uterine artery pulsatility index (UtA-PI) measured by a new transverse approach versus that obtained from the conventional sagittal section approach; 2) determine if accelerated onsite training to inexperienced sonographers can achieve reproducible UtA-PI measurement compared to that measured by an experienced sonographer; and 3) compare the time required to perform UtA-PI between the two approaches.

Methods

One experienced and three inexperienced sonographers prospectively measured UtA-PI at the level of internal os at 11-13 weeks' gestation in two groups of women (42 and 35, respectively), with viable singleton pregnancies using both approaches. All inexperienced sonographers had no prior experience in measurement of the UtA-PI and underwent accelerated onsite training by the experienced sonographer. Measurement approach and sonographer order were on a random basis. Intra-class correlation (ICC), Bland-Altman and Passing-Bablok analyses were performed to assess measurement agreement, reliability and effect of accelerated training. Timing required for UtA-PI measurement was recorded for each technique.

Results

There were no significant differences in the median UtA-PI measurements using the different approaches for both experienced and inexperienced sonographers ($p>0.05$ for all sonographers). Mean UtA-PI measurement reliability between approaches was high for the experienced (ICC=0.92) and inexperienced sonographers (ICC>0.81). UtA-PI measurement approaches did not deviate from linearity whilst biases ranged from -0.10 to 0.07. Median time required was similar (sagittal vs. transverse: 56.11 sec vs. 49.29 sec; $p=0.054$).

Conclusion

The measurement of UtA-PI obtained by the sagittal and transverse section approaches is equivalent and can be utilized in the first trimester screening of preeclampsia. Providing accelerated onsite training can be helpful to improve UtA-PI measurement reliability.