BJOG An International Journal of Obstetrics and Gynaecology

DOI: 10.1111/1471-0528.6_17521
www.bjog.org

Abstracts

PP.0134

Fetal growth velocity: Which method of assessment can best identify stillbirth risk?

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Objective: Fetal growth surveillance includes assessment of size as well as growth rate. Four standards for growth velocity have recently been adopted into clinical practice [1–4]. We set out to evaluate their effectiveness in identifying slow growth in fetuses at increased risk of stillbirth that were not SGA according to their last estimated fetal weight (EFW).

Design: Retrospective cohort study

Method: The cohort consisted of 164,718 singleton pregnancies that had two or more third trimester EFW measurements, mostly for having been considered to be at increased risk at their early pregnancy assessment. Small for gestational age (SGA) was defined as <10th customised centile, and slow growth was defined by one of the following models: 1. fixed velocity limit of 20 g per day (FVL_{20})[1]; 2. fixed 50 centile drop (FCD_{50})[2] over an unspecified scan interval; 3. fixed 30 centile drop (FCD_{30})[3] over an unspecified scan interval; and 4. projected optimal weight range (POWR)[4], which varies according to scan interval.

Results: The study cohort had a total of 480,592 third trimester scans (mean 2.9, SD 0.9) and included 262 stillbirths (1.59/1000). The last 2 scans in each pregnancy were performed at average gestational ages of 33+5 and 37+1 weeks. At last scan, 12,858 (7.8%) of EFWs were SGA and of these, 9,359 were also SGA at birth (positive predictive value 72.8%). The 4 velocity methods identified slow growth at different rates (FVL_{20}: 12.7%, FCD_{50}: 0.7%, FCD_{30}: 4.6%, POWR: 10.1%) and had varying overlap with SGA at last scan. After excluding fetuses that were SGA at last scan, only the POWR method identified additional, non-SGA cases of slow growth (11,237/16,671, 67.4%) that were associated with increased stillbirth risk (RR 1.58, CI 1.04–2.39). The stillbirths identified in this manner had an average birthweight centile of 27.3. Subgroup analysis identified methodological problems with the fixed velocity limit (FVL_{20}) because it ignores normal variation in growth rate during the third trimester; and problems with the fixed centile drop methods (FCD_{50} and FCD_{30}) because centile distributions are expanded at the extremes and fail to represent actual differences in weight gain.

Conclusion: Comparative analysis of four methods to define slow fetal growth has shown that only the measurement interval specific projection model of optimal weight gain[4] identified non-SGA fetuses at risk of stillbirth because of slow growth.

References:

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