

Routine second-trimester estimated fetal weight centile predicts fetal growth restriction at term

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Background

- Fetal growth restriction (FGR) is a major risk factor for stillbirth¹. Detection of FGR reduces stillbirth risk¹; and being <3rd centile is diagnostic of FGR²
- BUT* selective ultrasound fails to detect **most** fetuses subsequently born at <3rd centile³
- The routine second-trimester morphology scan includes fetal biometry. Little is done with this data

Hypothesis

Birthweight is influenced by placental health across the whole pregnancy. We hypothesise that 2nd-trimester estimated fetal weight (EFW) centile can predict increased risk of FGR later in pregnancy.

Population

- Singleton pregnancies with a scan with biometry performed between 17⁺⁰ and 23⁺⁰ weeks;
- AND* EFW ≥10th centile at the 2nd-trimester scan (SGA fetuses at time of scan excluded)
- AND* normal morphology (congenital anomalies excluded)

Methods

- EFW by Hadlock-3; EFW and birthweight centiles calculated by Fetal Region-specific Optimised Growth Standard⁴
- Logistic regression assessed 2nd trimester EFW centile's prediction of FGR (<3rd centile at birth)
- Sub-analysis in term (≥37 weeks) birth cohort
- Thresholds approximating 10% and 20% false positive rates (FPRs) were applied (*Table 2*)

Results

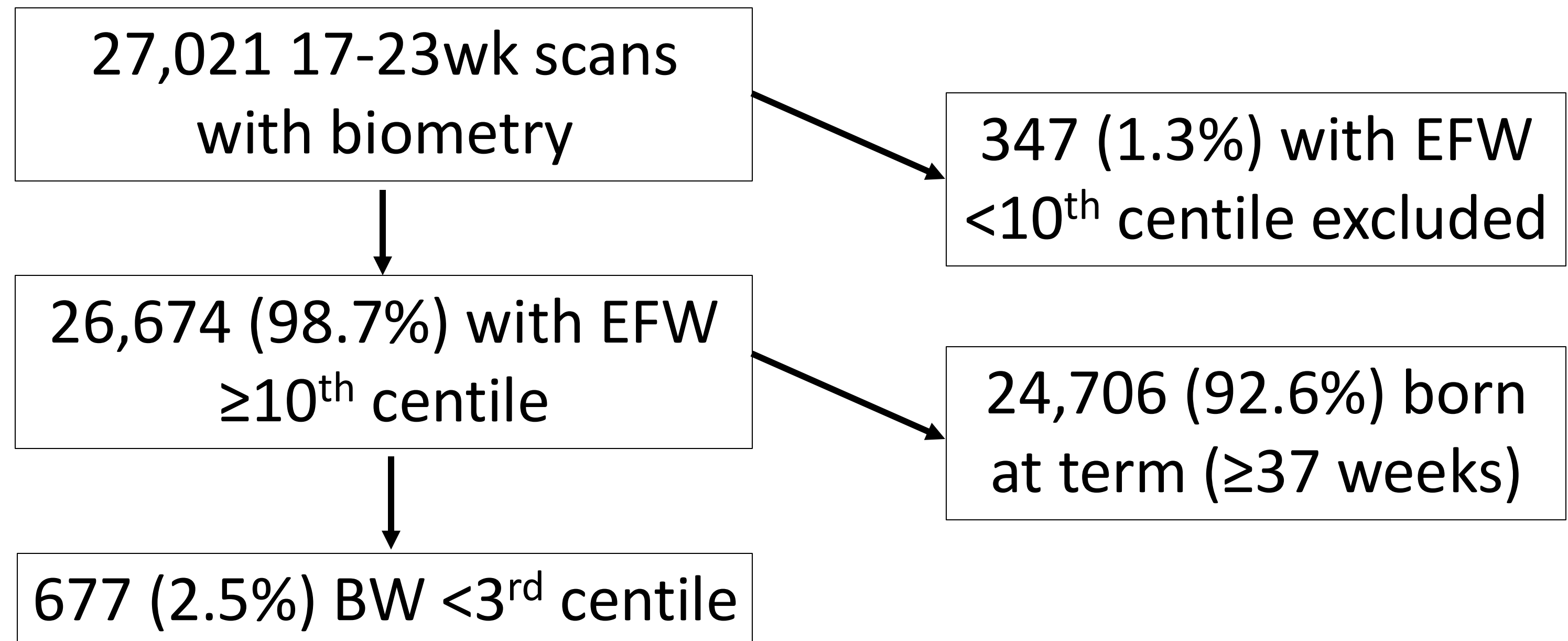
- Usually ~10% of fetuses are SGA, but **only 1.3%** were SGA at 2nd-trimester scan (*Figure 1*)
- Even among “normal” sized fetuses, the smaller the fetus at 2nd-trimester scan, the higher the risk of later FGR (<3rd centile), even at term (*Table 1*)

Cohort	OR for FGR per centile reduction in 2 nd trimester ultrasound EFW	AUC
Whole	1.040 [1.037-1.044], p<10 ⁻¹⁵	0.75
Term births	1.041 [1.037-1.046], p<10 ⁻¹⁵	0.76

Table 1. Mid-trimester EFW centile's prediction of FGR.

OR=Odds Ratio; AUC=Area Under (Receiver Operator Characteristic) Curve

Figure 1. Cohort Flowchart



2 nd trimester EFW centile	Sensitivity	Specificity	OR for FGR if below this threshold
<34 th centile	38%	90%	5.4 [4.6-6.3] p<0.0001
<46 th centile	56%	80%	5.1 [4.4-5.9] p<0.0001

Table 2. 2nd-trimester EFW centile cut-offs for ~10% and 20% FPRs, and their prediction of later FGR among the AGA.

CONCLUSION: The smaller the fetus at routine 2nd-trimester scan, the higher the odds of later FGR. The smallest 10-20% of AGA fetuses in the 2nd-trimester have 5-fold increased risk of FGR. Thus, this finding should prompt referral for serial growth scans.

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Refs: 1. Gardosi 2013; 2. Gordijn 2016; 3. Sovio 2015; 4. Pritchard 2025



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