

Uterine artery doppler: A predictor of abnormal foetal growth in high-risk pregnancies

Objective

To assess the pick up rate of foetal growth restriction (FGR) and small for gestation age (SGA) with mid-trimester uterine artery doppler (UtAD).

Importance

- SGA is associated with increased morbidity & mortality – identification antenatally can reduce this by optimising timing of delivery
- Up to **20% of SGA can be contributed to FGR**, chromosomal or structural abnormalities or infection
- In a high risk population, mid-trimester UtAD has a moderate predictive value for SGA (20-24/40)
- Element 2 of Saving Babies Lives suggests **FGR is the biggest risk factor for stillbirth** and that the majority of FGR cases are associated with abnormal UAD indices or estimated fetal weight (EFW) <10th centile in 3rd trimester

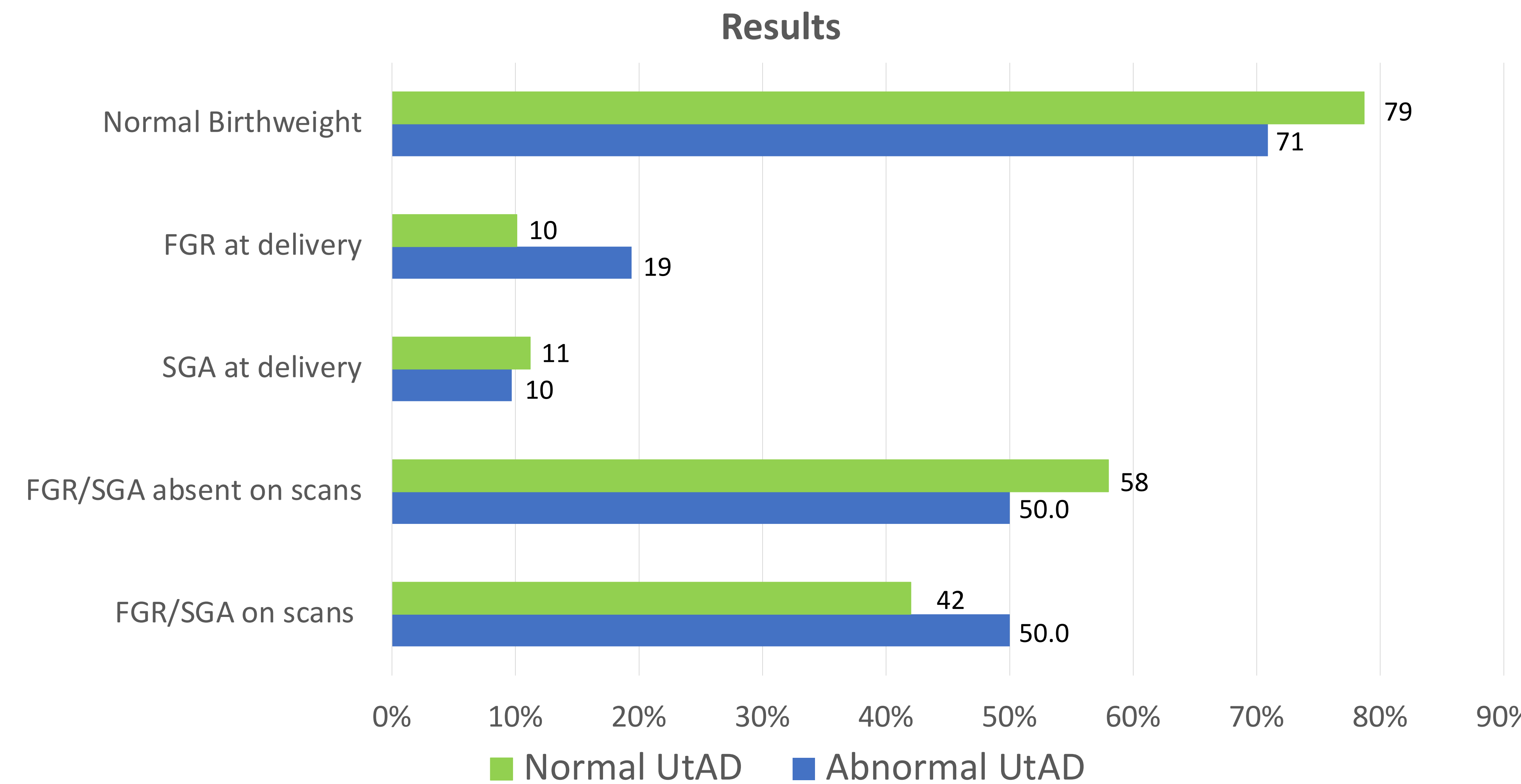
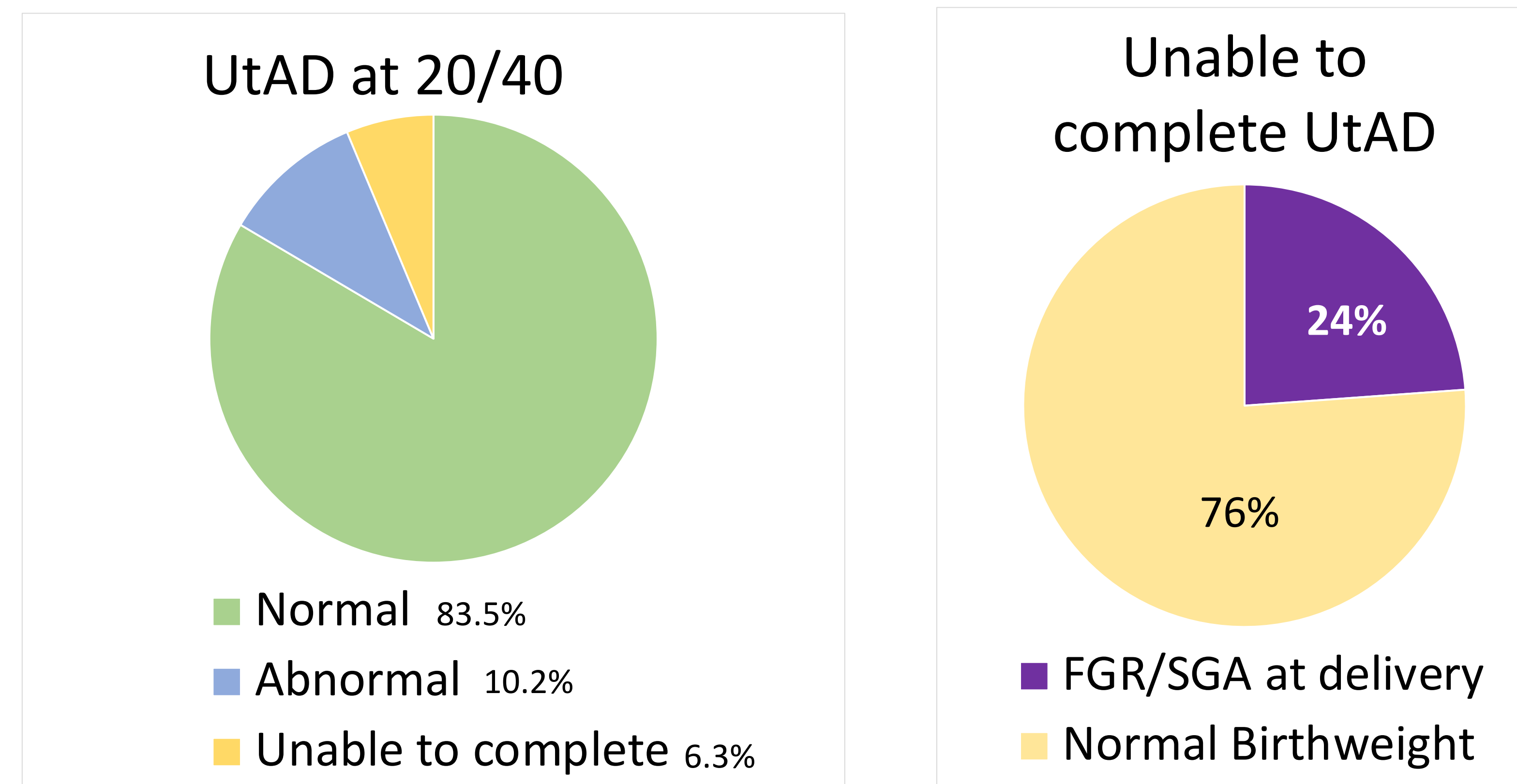
Design & Method

- Retrospective audit spanning 12 months at Worcester Acute Hospitals
- The standard used was our local guideline, based on Saving Babies Lives Care Bundle V2
- Those identified as at risk of SGA or FGR, assessed by the bundle, were invited for a mid-trimester UtAD → **N = 333**

High risk included:

- Maternal comorbidities
- Obstetric History: previous FGR, previous SGA stillbirth, previous hypertensive disease of pregnancy
- Current pregnancy: estimated foetal weight (EFW) <10th centile, PAPP-A <5th centile, echogenic bowel, significant bleeding

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Results

Those with abnormal UAD (presence of notching or raised PI) started serial growth and umbilical artery doppler (UAD) monitoring from 28/40. Normal UAD commenced serial growth +/- UAD from 32/40

- 83.5 % had normal mid-trimester UtAD, **10.2% had abnormal results**
- 40% of all high risk babies scanned were measuring SGA or FGR on ultrasound scan
- 22% of all high risk babies were SGA or FGR at delivery
- 12% of all SGA/FGR had abnormal UtAD
- 6.3% were unable to be completed and therefore treated as high risk with serial sonography from 28/40. These were all due to raised BMI. 24% of this group were SGA or FGR
- 29% of women had an extra foetal surveillance scan at 28/40 despite normal mid-trimester UAD results

Conclusion & Clinical Implication

- A normal mid-trimester UtAD is unlikely to result in FGR.
- BMI is a significant risk factor
- Identification of abnormal UtAD allows increased surveillance and optimisation of care, including timing of delivery
- Following an algorithm or pathway to ensure appropriate timing of serial growth scans will reduce unnecessary scanning and reduce ultrasound demands and costs
- Regular service review needs to take place, with the focus on capacity & training.

1) RCOG. The Investigation and Management of the small-for-gestational age fetus: Greentop Guideline no. 31. (2014). Available at: https://www.rcog.org.uk/media/t3lmjhn/gtg_31.pdf

2) NHS England. Saving babies lives version 2: a care bundle for reducing perinatal mortality. (2019). Available atL <https://www.england.nhs.uk/wp-content/uploads/2019/03/Saving-Babies-Lives-Care-Bundle-Version-Two-Updated-Final-Version.pdf>