

Accuracy of Antenatal Ultrasound in Detecting Large-for-Gestational Age Fetuses

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Introduction

The Big Baby trial is a randomised controlled trial of 4,000 women to assess if induction of labour reduces the incidence of shoulder dystocia in women with a suspected large-for-gestational age (LGA) fetus. To enter the trial women have an ultrasound (USS) between 35-38 weeks gestation to determine if the baby's weight is estimated to be >90th centile on GROW and is therefore, LGA. Across the literature there are varying sensitivities of USS to detect LGA reported, making it difficult to counsel women prior to trial entry¹.

Aims and Objectives

The aim of this study was to determine the accuracy of antenatal ultrasound in detecting LGA. Therefore, improving antenatal counselling to the women with a suspected LGA fetus and also to enhance recruitment to the Big Baby Trial.

The objectives of this study were to determine the sensitivity, specificity and positive and negative predictive values of USS in detecting LGA in the West Midlands population

Methods

Design

- Retrospective analysis of the West Midlands PEER database
- Routinely collected data from 164,000 deliveries
- 2009-2012

Population

- Women who had an antenatal USS between 35⁺⁰-38⁺⁰ weeks gestation
- Any indication for scan
- An estimated fetal weight must be obtained

Diagnosis

- Estimated fetal weight (EFW) >90th customised centile on GROW

Outcome

- Neonatal birth weight >90th customised centile

Results

- 26,527 women had a USS between 35⁺⁰-38⁺⁰
- Median interval from scan to delivery was 20 days
- 15,239 (57.4%) no indication for scan was recorded
- For those with an indication see table 1. Note there was no routine policy to scan for LGA between 2009-2012

Indication	n	%
Risk identified at booking	5,465	48.6
Other	5,370	47.8
Suspected IUGR	2,308	20.5
Pregnancy complication	1,299	11.6
Decreased fetal movements	602	5.4
Late booker	242	2.2

Table 1. Indications for antenatal ultrasound detailing the number and percentage of women scanned for that indication. Women with no indication recorded are not included on this table

- Table 2 details the baseline characteristics of the women who had an USS between 35⁺⁰-38⁺⁰ in comparison to the women in the PEER database. There are more diabetic women in the USS group as is routine policy to undertake a fetal growth assessment.

Variable		USS		PEER Database ²	
		n	%	n	%
Parity	Nulliparous	9,652	36.4	38,653	42.2
	Other	19,908	75.0	64,384	72.7
Diabetes	Gestational	2,003	7.8	2876	3.2
	Pre-existing	456	1.7	727	0.8
Hypertension	Gestational	1,513	5.8	4370	4.8
	Pre-existing	1,046	4.0	2437	2.7
Smoking	Yes	5,325	20.4	17,838	20.9

Table 2. Baseline characteristics of the women in the USS group and in the PEER database.

- The media gestation of delivery was 276 days (39⁺⁴ weeks).

- Table 3 details the LGA and small-for-gestational age (SGA) rates.

	USS (%)	PEER Database ² (%)
LGA rate	8.5	7.0
SGA rate	19.9	14.1

Table 3. LGA and SGA rates for the USS group and PEER database

- Table 4 shows the 2x2 table for those that were predicted as having an EFW >90th (LGA).

EFW >90 th centile	Birth weight >90 th centile		Total
	Yes	No	
Yes	1459	2097	3556
No	782	22189	22971
Total	2241	24286	26527

Table 4. 2x2 table showing the number of women who had an EFW >90th and <90th centile on scan in comparison to the number of women who had a birth weight >90th <90th customised centile

- Table 5 shows the accuracy statistics for antenatal USS between 35⁺⁰-38⁺⁰ in detecting LGA.

Sensitivity	65.1%
Specificity	91.4%
Positive Predictive Value	41.0%
Negative Predictive Value	96.6%
False Positive	8.6%
False Negative	34.9%

Table 5. Accuracy statistics for antenatal USS ability to detect LGA

Conclusions

Antenatal ultrasound has a respectable sensitivity to detect LGA (65.1%). However the positive predictive value is poor at 41.0%. This is important to inform women when they are deciding to enter the Big Baby Trial.

References

1. Coomarasamy A, Connock M, Thornton J, Khan KS. Accuracy of ultrasound biometry in the prediction of macrosomia: a systematic quantitative review. BJOG 2005;112:1461-6
2. Gardosi J, Madurasinghe V, Williams M, Malik A, Francis A. Maternal and fetal risk factors for stillbirth: population based study. BMJ 2013;364:f108. doi:10.1136/bmj.f108