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Objective

- Large for gestational age (LGA) at delivery is associated with adverse maternal and neonatal outcomes
- The aim of this study was to investigate the ability of antenatal ultrasound scan to predict LGA at birth

Methods

- We analysed routinely recorded data on 160,652 singleton pregnancies collected in the PEER database, NHS West Midlands 2009-12.
- 26,527 pregnancies had an ultrasound estimated fetal weight (EFW) between 35+0 to 38+0 weeks gestation. Most EFWs were done for suspected SGA, but in 912 pregnancies the scan was performed for suspected LGA.
- We undertook comparative analysis of two commonly applied methods for predicting large babies at birth:
 1. An EFW >90th customised centile, predicting a neonatal weight >90th customised birthweight centile.
 2. An EFW >90th centile according to the Hadlock fetal weight standard, predicting neonatal macrosomia (>4kg).
- We undertook these analyses for the overall cohort (26,527) as well as the subgroup (912) scanned for suspected LGA.
- We calculated sensitivity, positive predictive value (PPV) and false positive rate (FPR) and diagnostic odds ratio (DOR).

Results (1)

- The median gestational age at scan was 255 days and at delivery 276 days (IQR 15) (= average 20-day interval)
- 2241 babies were LGA at birth (8.4%); 1459 of these were detected antenatally (DR 65.1%), with PPV 41.0% and FPR 8.6%, with an overall DOR of 19.7 (95% CI 17.9 – 21.8)
- Of the 912 pregnancies, 293 were born LGA (32.1%) with high sensitivity (DR 77.1%) but also high false +ve rate 50.3%, FPR 36.0% and a DOR of 6.0 (4.4-8.2).

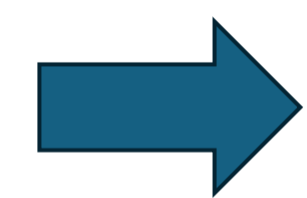
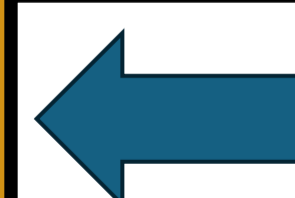


Table 1. Customised LGA EFW and birthweight

		All scans N=26,527		Scans for suspected LGA n=912	
Birthweight centile		>90th	≤90th	>90th	≤90th
Scan EFW >90th centile	<i>n</i>	1459	2097	226	223
Scan EFW ≤90th centile	<i>n</i>	782	22189	67	396
Scan EFW LGA rate	%	13.4		49.2	
Birthweight LGA rate	%	8.4		32.1	
Sensitivity	%	65.1		77.1	
Specificity	%	91.4		64.0	
False Positive Rate	%	8.6		36.0	
False Negative Rate	%	34.9		22.9	
Positive Predictive Value	%	41.0		50.3	
Negative Predictive Value	%	96.6		85.5	
Positive Likelihood Ratio		7.5		2.1	
Negative Likelihood Ratio		0.4		0.4	
Diagnostic odds ratio		19.7		6.0	
95% Confidence Interval		17.9 - 21.8		4.4 - 8.2	

Table 2. Hadlock LGA and macrosomia (>4kg)

		All scans N=26,527		Scans for suspected LGA n=912	
		>4kg	≤4kg	>4kg	≤4kg
Birthweight					
Scan EFW >90th centile	<i>n</i>	1058	1177	188	129
Scan EFW ≤90th centile	<i>n</i>	1527	22765	123	472
Scan EFW LGA rate	%	8.4		34.8	
Birthweight >4kg rate	%	9.7		34.1	
Sensitivity	%	40.9		60.5	
Specificity	%	95.1		78.5	
False Positive Rate	%	4.9		21.5	
False Negative Rate	%	59.1		39.5	
Positive Predictive Value	%	47.3		59.3	
Negative Predictive Value	%	93.7		79.3	
Positive Likelihood Ratio		8.3		2.8	
Negative Likelihood Ratio		0.6		0.5	
Diagnostic odds ratio		13.4		5.6	
95% Confidence Interval		12.2 - 14.8		4.1 - 7.5	



Results (2)

- 2585 babies were macrosomic at birth (9.7%), of which 1058 were detected antenatally (DR 40.9%).
- Using Hadlock for predicting macrosomia gave a higher PPV (47.3%) and lower FP rate (4.9%) .
- However overall performance was better with customised than uncustomed methods as concerns sensitivity (65.1% vs 40.9%), and a higher Diagnostic Odds Ratio (19.7 vs 13.4).

Conclusion

- Late third trimester EFW has a reasonably good ability to identify and predict LGA at birth and improves with the use of a customised standard. Detection rate is better when ultrasound is performed for a suspected large fetus, however at the risk of higher false+ diagnosis.
- Our results provide information for women and clinicians to aid antenatal decision making in pregnancies with large babies.