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Designation of small-for-gestational age according to seven fetal growth charts in England's National Health Service: Retrospective analysis of 3.2 million births

Oliver Hugh, Amanda Merricks, Emily Butler, Hanna Ellson, Jason Gardosi

Perinatal Institute, Birmingham, UK

Objective: The latest guidelines for antenatal management of small-for-gestational age (SGA) babies do not specify which fetal growth charts to use. We investigated the SGA screen positive rates of standards in current use in England.

Methods: A retrospective cohort study of electronic data recorded as part of routine care for 38 of the 42 NHS Integrated Care Boards (ICBs) in England was carried out. Rates of SGA (<10th centile) weight at birth, were calculated according to seven fetal weight standards: Hadlock,¹ Intergrowth-21st (IG21; versions 2017² and 2020³), World Health Organization⁴ (WHO), Fetal Medicine Foundation⁵ (FMF), GROW Lite (UK average) and GROW (customised for maternal height, weight, parity and ethnic origin).

Results: The cohort included 3,201,199 women with singleton pregnancies delivered between 2015 and 2025. There was wide variation in maternal characteristics between ICBs, including ethnic origin (English: mean 65.6%, range 19.8–92.2) and high body mass index (BMI >30: mean 24.8%, range 16.3–29.4). The range of centiles across all ICBs was wider for all population-average standards and correlated significantly with ethnicity and maternal size. The customised GROW standard had SGA (<10) rate of 13.4% and narrowest range across ICBs (11.6–15.2%). Average SGA (<10) rates for term births (>37.0 weeks) were lowest for IG21 (2017) (4.8%), highest for WHO and FMF (both 17.2%) and 12.3% with GROW (Table 1).

Conclusion: Uncustomised fetal weight charts in current NHS use do not reflect the average, distribution and variation of birthweight in our maternity population and are likely to miss fetuses at risk due to restricted growth.

References:

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Standard	Pregnancies	SGA <10th	
		Mean	Range
Hadlock	<i>All</i>	13.6	11.1 - 19.6
	<i>Term</i>	12.6	10.1 - 18.5
IG21 2017	<i>All</i>	5.5	4.3 - 8.5
	<i>Term</i>	4.8	3.6 - 7.7
IG21 2020	<i>All</i>	8.4	6.6 - 12.6
	<i>Term</i>	7.5	5.8 - 11.6
WHO	<i>All</i>	18.1	15.2 - 25.4
	<i>Term</i>	17.2	14.3 - 24.5
FMF	<i>All</i>	18.7	15.6 - 26.0
	<i>Term</i>	17.2	14.1 - 24.5
GROW Lite	<i>All</i>	12.3	10.0 - 17.8
	<i>Term</i>	11.2	9.0 - 16.7
GROW	<i>All</i>	13.4	11.6 - 15.2
	<i>Term</i>	12.3	10.5 - 13.9

Table 224.1 Fetal weight standard averages and ranges across ICBs, for all and for term only (>37 weeks) births (N = 3,201,199).