Illustrative analysis

An Illustrative Analysis of the BEGOTTEN Study: Patterns of Fetal Growth and Pregnancy Outcomes

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Introduction

This study compares fetal growth trajectories using antenatal ultrasound measurements between South Asian and White populations in East London, based on data from the BEGOTTEN study [1]. The primary aim is to examine growth velocity changes between the 20-week scan, 32-week scan, and birth weight, and to explore how these changes relate to neonatal outcomes, such as APGAR scores, delivery methods, and birth centiles. A prospective cohort design has been used to examine ethnicity-specific differences in fetal growth and their association with neonatal and maternal outcomes over a period of 9 months.

Method

Participants, who did not have a history of hypertension, were randomly recruited at routine dating (11-14 weeks) at Royal London Hospital. This analysis compares fetal growth and birth outcomes in South Asian (n=77) and White (n=34) populations. The analysis includes fetal biometrics, birth weights, customised centiles, APGAR scores, and delivery methods, focusing on growth velocity between 20 and 32 weeks and its relation to birth outcomes.

Results

Fetal Growth Trajectories

Population	EFW 20/40		EFW 28-32/40		Δ 20/40 and 28-32/40 EFW		BW		Δ 28-32/40 EFW and BW	
	M	SD	M	SD	M	SD	M	SD	M	SD
South Asian	342.44	49.37	1873.39	215.95	1530.95	209.69	3088.55	429.58	1215.16	377.45
White	343.03	38.98	1912.15	157.14	1569.13	151.34	3420.59	488.16	1508.43	450.21

Post-natal Outcomes

Ethnicity	SVD		Assisted		ELCS		EMCS		p-value
	n	%	n	%	n	%	n	%	
South Asian	36	46.7	12	15.58	5	6.49	24	31.17	0.0813[1]
White	13	38.24	5	14.71	8	23.53	8	23.53	

Ethnicity	BW < 3rd centile	BW 3rd - 10th centile	BW 10th – 90th centile	BW > 90th centile	p-value
South Asian	3	9	59	6	0.5848[1]
White	0	3	27	4	

Ethnicity	EBL (mL)		
	Mean	SD	p-value
South Asian	491.82	321.53	0.0271[1]
White	751.47	625.04	

Ethnicity	APGAR < 7 at 5 minutes
South Asian	1
White	0

Discussion

This preliminary analysis supports the initial hypothesis that fetal growth trajectories, as assessed at 20 weeks and 28-32 weeks' gestation, differ between South Asian and White populations in East London and that these differences are affiliated with distinct and often unfavourable postnatal outcomes. The results show that while fetal growth at 20 weeks was comparable between groups, South Asian fetuses demonstrated greater variability in early growth patterns and a slower growth velocity from 28–32 weeks to birth, resulting in lower average birth weights and increased incidence of SGA neonates, albeit without reaching statistical significance (p = 0.58481). Additionally, maternal outcomes displayed trends toward higher rates of emergency caesarean section and assisted deliveries among South Asian women; however, these differences did not achieve statistical significance (p = 0.08131). In contrast, the significant difference in estimated blood loss (p = 0.02711), with White women experiencing greater intrapartum blood loss, highlights clinically important ethnic disparities in maternal morbidity. This study underscores the urgent need for tailored antenatal care protocols that reflect ethnic diversity, particularly in diversity of East London and highlights the need for incorporating ethnicity-specific fetal growth trajectories to enhance diagnostic accuracy to facilitate earlier intervention for abnormal fetal growth and minimise adverse perinatal outcomes. As the full BEGOTTEN [1] study advances, larger, more statistically powered cohorts will be essential to validate these preliminary findings and guide the development of culturally sensitive and equitable strategies in antenatal care.

References:

[1] Iliodromiti S, et al. 2023. Fetal Growth and Pregnancy Outcomes in Multi-Ethnic Populations. Available: Patterns of fetal growth and maternal blood pressure and pregnancy outcomes: A prospective cohort study in a multi-ethnic population in East London (BEGOTTEN study)

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