

What is the influence of Pre-pregnancy BMI, Gestational Weight Gain and Antenatal Glucose Parameters on the risk of LGA in Women with Gestational Diabetes?

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Background: The Hyperglycemia and Adverse Pregnancy Outcomes(HAPO) study established association between antenatal glucose parameters and large for gestational age(LGA) infants. Our institution previously published that elevated pre-pregnancy BMI and excessive gestational weight gain(eGWG), are independent predictors of large for gestational age infants¹. Additionally, women with an elevated BMI in the context of gestational diabetes(GDM) are at even higher risk of LGA².

Aims: To examine the relationship of pre-pregnancy BMI($\geq 25\text{kg/m}^2$), eGWG and antenatal 75g oral glucose tolerance test results on LGA risk.

Methods: A retrospective cohort study of 3248 pregnancies in 2759 GDM women(1993-2013), at Bankstown-Lidcombe Hospital. GDM was defined according to ADIPS(1998) Australian criteria. eGWG was classified according to Institute of Medicine maternal weight gain targets for the entire pregnancy, stratified according to pre-pregnancy BMI. Chi-square analyses and odds ratios(ORs) were calculated and logistic regression used to determine adjusted ORs for LGA(ethnic specific birth weight $>90^{\text{th}}$ percentile).

Results: LGA rate was 14.6% overall. Fasting blood glucose level(FBGL $\geq 5.5\text{mmol/L}$), eGWG and BMI $\geq 25\text{kg/m}^2$ were positive predictors of LGA. There was a lack of relationship between LGA and 2-hour glucose level(2hrBGL $\geq 8.0\text{mmol/L}$). On binary logistic regression, only FBGL $\geq 5.5\text{mmol/L}$ and eGWG were independent predictors. ORs of LGA are shown in Table 1. BMI $\geq 25\text{kg/m}^2$ did not confer any additional risk to that conferred by FBGL $\geq 5.5\text{mmol/L}$, or eGWG. However, those with both eGWG and FBGL $\geq 5.5\text{mmol/L}$ had an OR of 2.8 (95% CI 2.2 – 3.5) for LGA.

Table 1

	Unadjusted OR (95% CI)	*Adjusted OR (95% CI),
Pre-pregnancy BMI $\geq 25\text{kg/m}^2$ (n=1595/3248)	1.6 (1.3 - 1.9)	NS
eGWG (n= 1215/3179)	2.5 (2.1 - 3.1)	2.2 (1.8 – 2.7)
FBGL $\geq 5.5\text{mmol/L}$ (n=999/3248)	2.0 (1.7 – 2.5)	1.7 (1.3 – 2.1)
2hrBGL $\geq 8.0\text{mmol/L}$ (n=2520/3248)	0.6 (0.5 – 0.8)	NS

*Adjusted for elevated BMI, FBGL, 2hrBGL, and excessive GWG.

Discussion: Only eGWG and FBGL $\geq 5.5\text{mmol/L}$ were positive predictors of LGA on logistic regression modelling. Pre-pregnancy BMI $\geq 25\text{kg/m}^2$ did not confer additional risk. eGWG resulted in the highest risk of LGA. A combination of eGWG with FGL $\geq 5.5\text{mmol/L}$ conferred almost a 3-fold risk of LGA.

Conclusion: In this cohort, eGWG had the highest OR for LGA, independent of pre-pregnancy BMI. GDM management must also focus on GWG, hence a glucose-centric approach should be avoided.

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References

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