Impact of Gestational Weight Gain according to 2009 IOM Recommendations on Neonatal Anthropometrics in Asians: A Pilot Study from Malaysia

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Introduction: Gestational Weight Gain (GWG) modulates pregnancy outcomes and long-term offspring metabolic health [1,2]. Thus far, the widely used 2009 Institute of Medicine (IOM) recommendations on GWG have largely been evaluated in Caucasian populations and some mono-ethnic East Asian cohorts. We designed this study to determine if IOM GWG thresholds are applicable in a multi-ethnic Asian cohort of Malaysian mothers.

Methods: In this prospective observational study, 875 mothers were recruited from a Malaysian tertiary urban center during screening for gestational diabetes. Amongst data collected were Total GWG (maternal weight at delivery – self-reported pre-gravid weight) and neonatal anthropometrics. BMI was stratified by Caucasian (overweight ≥25kg/m², obese ≥30 kg/m²) and Asian (overweight ≥23kg/m², obese ≥27.5kg/m²) thresholds, and patients categorized by 2009 IOM GWG recommendations.

Results: This study included 67% Malay, 23% Chinese and 10% Indian mothers. There was a high prevalence of overweight/obesity regardless of cut-offs used (Asian 56.9% vs Caucasian 44%). When Asian BMI cut-offs were used, excessive GWG prevalence increased (34.1% → 40.6%) whilst inadequate GWG declined (30% → 24.9%). Prevalence of LGA, macrosomia, Birth Weight(BW)/Neonatal Fat Mass(NFM)/Sum of Skinfold Thickness(SSFT) >90th centile was highest (p<0.05) in those with excess GWG whether stratified by Caucasian or Asian BMI cut-offs. Upon multivariate analysis adjusting for age, parity, race, GDM, Ln HOMA2%S and baby gender, excessive GWG (by Asian BMI categories) was associated only with increased risk of SSFT >90th centile (aOR 5.7, 95% CI 2.33–14.03). Excessive GWG (by Caucasian BMI categories) was associated with increased risk of macrosomia (aOR 8.65, 95% CI 1.07–70.01), NFM >90th centile (aOR 2.14, 95% CI 1.02–4.45) and SSFT >90th centile (aOR 3.88, 95% CI 1.77–8.51). SGA status was associated with insufficient GWG by both Caucasian (aOR 4.26, 95% CI 2.46–7.38) and Asian BMI cut-offs (aOR 3.55, 95% CI 2.07–6.10).

Conclusion: The 2009 IOM recommendations, using either Caucasian or regional Asian BMI thresholds, are applicable in our multi-ethnic Asian cohort in terms of predicting increased neonatal adiposity and SGA status.