

Maternal booking body mass index and birth weight: A retrospective population-based cohort study of mother-infant pairs in 5 tertiary hospitals based on the National Obstetric Registry (NOR) of Malaysia

Wong Carmen¹, Sor Ji Bin¹, Nurakmal Baharum², Nurfaezah Zakaria³, Ravichandran Jeganathan³

¹Clinical School Johor Bahru, Monash University Malaysia, Johor Bahru, Johor, Malaysia, ²Centre for Coordination Clinical Research Network, Institute for Clinical Research, Kuala Lumpur, Wilayah Persekutuan Kuala Lumpur, Malaysia, ³Department of Obstetrics and Gynaecology, Hospital Sultanah Aminah, Johor Bahru, Johor, Malaysia

ABSTRACT

Introduction: Abnormal birth weights (BW) are associated with a significantly higher risk of developing health complications than infants with a normal BW, and maternal nutritional status has been found to be one of the key determinants of neonatal health outcomes. **Objectives:** This study aims to determine the association between maternal booking BMI and BW amongst populations of various ethnicities after adjusting for potential confounding variables, besides determining the association of maternal booking BMI and the development of maternal-foetal complications. **Materials and Methods:** This is a retrospective, population-based cohort study. Data on 194,447 mother-infant pairs with live births, in five tertiary hospitals, between January 2013 to December 2017, is retrospectively reviewed and extracted from the electronic medical records of the National Obstetric Registry of Malaysia. The extracted data included information on the mothers' age, BMI at booking, infant outcomes, ethnicity, antepartum and intrapartum history. Maternal booking BMI is categorised into underweight, normal, overweight, and obese. BW is categorised into low BW, normal BW and macrosomia. **Results:** There is a significant correlation between maternal booking BMI and BW. Underweight mothers are 73.3% ($p < 0.001$) more likely to give birth to low BW infants, whilst overweight and obese mothers are 88.1% ($P < 0.001$) and 184.8% ($P < 0.001$), respectively, more likely to give birth to macrosomic infants. Subgroup analysis based on maternal ethnicity reveals that Indian mothers have the highest prevalence of low BW and Malay mothers have the highest prevalence of macrosomia. Abnormal maternal booking BMI was also significantly correlated with antepartum, intrapartum, and neonatal complications where Indian mothers are found to have the highest morbidity risk as compared to mothers of other ethnicities. **Conclusions:** There is a direct causative effect between maternal booking BMI and BW. These findings can inform policies to optimise maternal BMI through nutritional interventions specific to respective ethnic groups to achieve optimal BW of infants and prevent the development of pregnancy complications.