

The impact of pre-pregnancy body mass index on weight gain: A two-year study among patients with gestational diabetes in Pasir Mas district, Kelantan

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ABSTRACT

Introduction: The prevalence of gestational diabetes mellitus (GDM) has been on the rise in Malaysia, reflecting a global trend of increasing rates of obesity. While previous studies have explored the association between pre-pregnancy body mass index (pBMI), gestational weight gain (GWG) and adverse pregnancy outcomes, limited research has focused specifically on the influence of pBMI on GWG among women diagnosed with GDM. Understanding this relationship is crucial for developing tailored interventions and guidelines that can effectively address the complexities of GDM management. The study aimed to determine the relationship of mean GWG between normal and excessive pBMI. **Materials and Methods:** A cross-sectional study was conducted in primary healthcare facilities with specialized personnel in the Pasir Mas District. The study focused on GDM patients who attended their initial antenatal visit during the first trimester. The participants were selected using a simple random sampling method. Data were collected retrospectively from June 2020 to June 2022 by reviewing antenatal records. The collected data included sociodemographic, clinical characteristics and the weight of the participants was measured at three different points. A two-way repeated measures analysis of covariance (RM ANCOVA) was performed to compare the GWG between normal and excessive pBMI groups. The analysis adjusted for age, parity, and the use of metformin. IBM SPSS version 26 was used for analysis. Model assumptions of normality, and homogeneity of covariance were checked, and the significance level was set at 0.05. **Results:** A total of 140 GDM patients were analysed. The mean age and pBMI of GDM patients were 30.1 (4.84) years old and 28.5 (6.80) kg/m², respectively. The majority of participants were unemployed (58.6%), multipara (74.3%) and attained a secondary education level or below (62.1%). The mean gestational age at diagnosis of GDM was 20.8 (5.49) weeks and the majority of them were managed with diet control alone (87.1%). Based on Wilks' Lambda correction, there were overall significant changes in GWG based on diagnosis, regardless of time [Wilks' lambda, $F(1, 135) = 0.968$, $p = 0.036$, effect size (η^2) = 0.032]. Additionally, there was an overall significant difference in mean GWG between groups over time [$F(1, 135) = 14.4$, $p < 0.001$, effect size (η^2) = 0.13]. There was no significant interaction between pBMI and GWG based on diagnosis [$F(1, 135) = 0.977$; $P = 0.080$, effect size (η^2) = 0.096]. However, a five-fold increment in GWG was observed in patients with abnormal pBMI compared to those with normal pBMI. **Conclusion:** The pre-pregnancy BMI may independently contribute to excessive weight gain during pregnancy, even in the absence of GDM. Timely identification of abnormal gestational weight gain and implementing lifestyle interventions are essential in managing excessive weight gain during pregnancy. Tailoring GDM management to the specific needs of pregnant individuals is crucial to prevent adverse pregnancy outcomes.