

The comparison of insulin and metformin on maternal and neonatal outcomes of gestational diabetes mellitus: A retrospective analysis

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ABSTRACT

Introduction: Gestational diabetes mellitus (GDM) affects a significant number of pregnant women in Malaysia and can lead to adverse maternal and neonatal outcomes if poorly managed. During the COVID-19 pandemic, metformin replaced insulin as the first-line pharmacological treatment in Negeri Sembilan due to limited hospital bed availability. With healthcare services now restored, a review of both treatments is essential to guide future GDM management. **Objectives:** To compare maternal and neonatal outcomes of insulin and metformin treatment in GDM patients unresponsive to diet modifications. **Materials and Methods:** This retrospective observational study compared two groups of pregnant women with GDM and failed diet control. The insulin group included 304 women treated from 18 March 2019 to 17 March 2020, while the metformin group included 306 women treated from 18 March 2020 to 17 March 2021. **Results:** There were no significant differences between groups in rates of macrosomia, neonatal hypoglycaemia, preterm delivery, gestational hypertension, pre-eclampsia, caesarean section, or postpartum haemorrhage. However, metformin was associated with significantly lower risks of neonatal jaundice requiring phototherapy (aOR: 0.44, 95% CI: 0.29-0.63, $p < 0.001$), respiratory morbidities (aOR: 0.18, 95%CI: 0.09-0.36, $p < 0.001$), and neonatal intensive care unit admission (aOR: 0.37, 95%CI: 0.18-0.73, $p = 0.004$). Other neonatal outcomes such as low birth weight, small or large for gestational age, birth asphyxia, and birth injuries showed no significant difference. **Conclusion:** Metformin is a safe and effective alternative to insulin for managing GDM unresponsive to diet in our setting. The findings support its continued use as a first-line pharmacological treatment.