

A Retrospective Observational Study on the Effect of the SARS-CoV-2 Pandemic on Patient Characteristics and Pregnancy Outcomes of Women with Gestational Diabetes in a Tertiary Hospital

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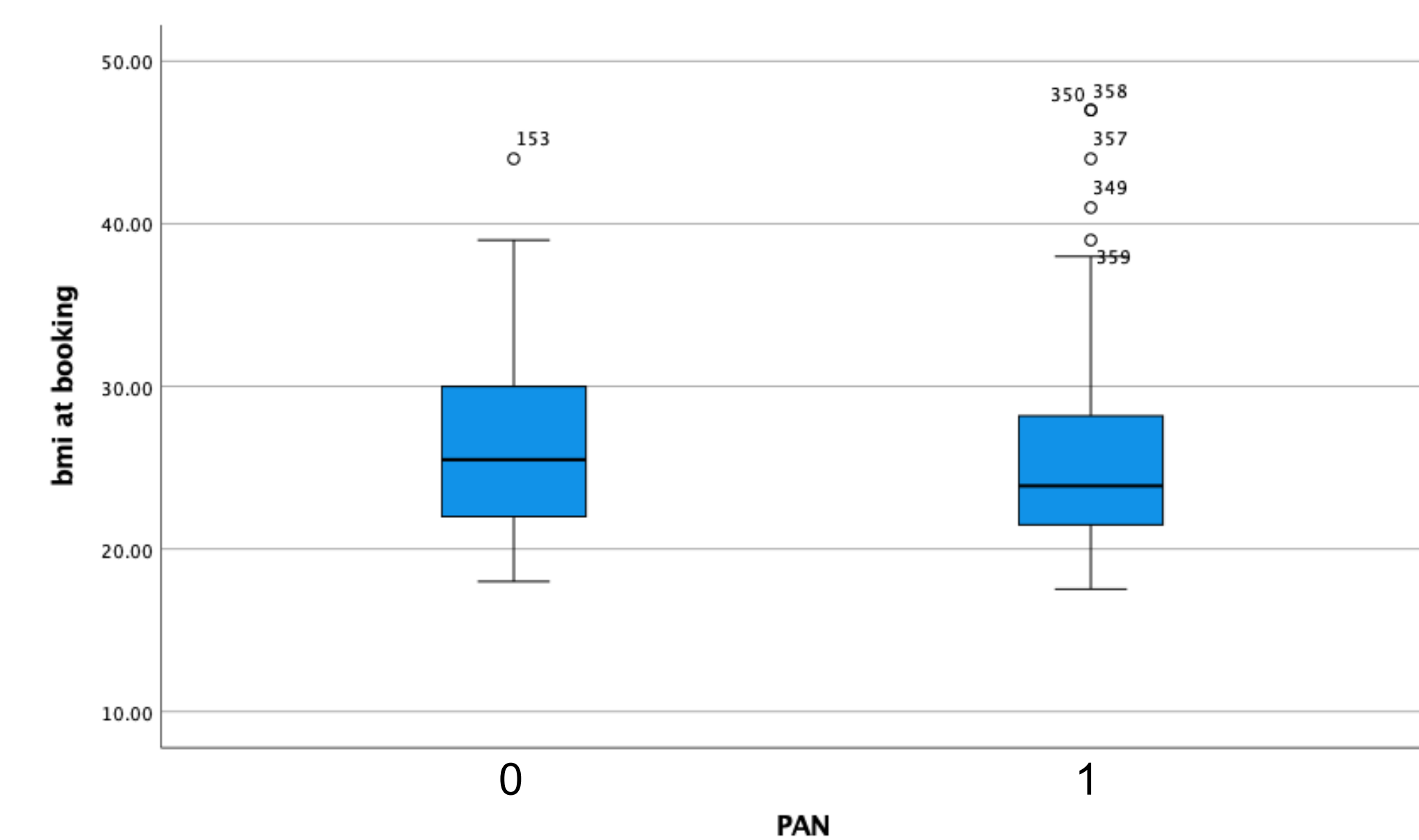
Objective: To determine whether the demographics and pregnancy outcomes of women with first-time gestational diabetes (ftGDM) were different during the SARS-CoV-2 Pandemic

Design: This is a retrospective observational study based in a London Tertiary Hospital. The primary outcome is the difference in pandemic maternal demographics which increased predisposition to developing ftGDM. Secondary outcomes were GDM management, HbA1c and maternal/perinatal complications.

Method: The Circonia Maternity Information System (CMIS) was used to identify women whose pregnancies were complicated by GDM and to extract demographic and pregnancy outcome data before (03/02/18-30/04/19) and during the pandemic (03/02/20-30/04/21). All women who delivered a singleton infant ≥ 24 weeks gestation were included. Women with booking HbA1c ≥ 42 (indicative of pre-diabetes/pre-existing diabetes), history of bariatric surgery or GDM in a previous pregnancy were excluded from the dataset. Statistical analysis was performed on SPSSv27 and the Mann-Whitney test was used to analyse non-parametric independent samples. Results were deemed statistically significant when $p < 0.05$.

Results: Data from 13,141 women were analysed. There was no difference in the BMI, ethnic distribution, maternal age or maternal complications in the overall population. Despite this, we found that the incidence of ftGDM increased during the pandemic from 2.4 to 3.2% ($p=0.0004$).

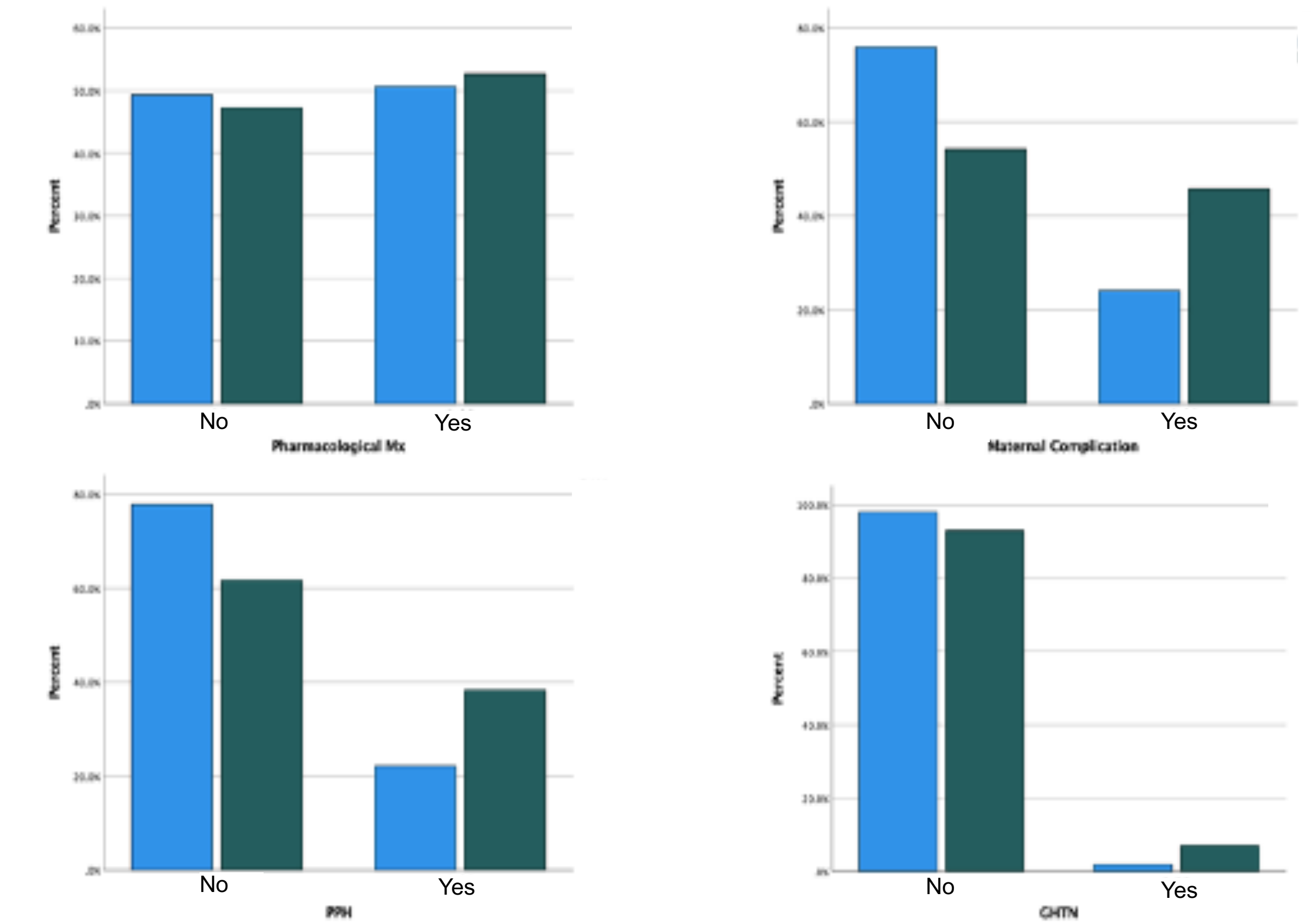
A greater proportion of Para1 mothers developed ftGDM during the pandemic ($P < 0.001$). These women had a lower booking BMI ($P=0.03$) than women with ftGDM pre-pandemic, and a greater proportion required pharmacological management ($P=0.033$). There was no statistically significant difference in maternal age, birth weight, mode of delivery, oral glucose tolerance test results, HbA1c or any perinatal adverse outcome compared to women with ftGDM prepandemic. However, a significantly higher rate of any maternal complication ($P < 0.001$), postpartum haemorrhage ($p=0.001$) and gestational hypertensive disease ($p=0.01$) was noted in the group of pandemic ftGDM.



Boxplot demonstrating significantly lower booking BMI in Patients with GDM
1= During the Pandemic
0= PrePandemic

Conclusions: In this retrospective analysis, we confirmed an increase in the incidence of GDM as reported by others[1, 2] in our antenatal population despite an absence in change in the recognized risk factors for GDM in our obstetric population (age, ethnicity). We noted a greater proportion of our ftGDM population were multiparous than previous, despite rates of multiparity in our control population remaining constant.

Further surprisingly, we noted that women with ftGDM during the pandemic had a significantly lower booking BMI than those diagnosed previously. It is unclear as to whether this reflects worsening pathophysiology of insulin resistance in subsequent pregnancies, or whether the effects of population lockdowns and more sedentary lifestyle patterns contributed. We do not routinely re-weigh women during pregnancy, and so we cannot out-rule greater gestational weight gain, as reported elsewhere[2]. More women required pharmacological management of GDM, which also may reflect the influence of population lockdowns on lifestyle interventions. Confinement has been demonstrated to cause increases in insulin resistance, total body fat, abdominal fat and inflammatory cytokines[3]. Furthermore, the impact of psychological stress has also been noted to worsen hyperglycaemia during lockdown periods[1, 3, 4]. Moreover, the increased rate of maternal complications in the pandemic ftGDM group, and in particular gestational hypertensive disease, is concerning. SARS-CoV-2 binds to the ACE2 receptor, known to be more expressed in individuals with diabetes[3], and in endothelial cells can then lead to activation of thrombin, intravascular inflammation and damage of target organ microvasculature. It has been reported that SARS-CoV-2 infection during pregnancy is associated with a significant increase in the odds of developing pre-eclampsia with a dose-response relationship[5]. At this stage, it is unclear how many of our patients with ftGDM may have been affected by this. Further investigation is needed to ascertain how the SARS-CoV-2 pandemic may have contributed to this phenomenon in patients with GDM.



Blue bars represent Prepandemic GDM Cases
Green bars represent Pandemic GDM Cases

References:

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