

## ORIGINAL ARTICLE

## Assessment of cases of gestational diabetes mellitus

<sup>1</sup>Geeta Rana, <sup>2</sup>Amit Varshney<sup>1</sup>Assistant Professor, Department of Obs & Gynae, Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, India;<sup>2</sup>Assistant Professor, Department of General Medicine, Sakshi Medical College, Guna, Madhya Pradesh, India**ABSTRACT:**

**Background:** GDM can cause prenatal and maternal complications for women such as: preeclampsia, cesarean delivery. The present study was conducted to evaluate cases of gestational diabetes mellitus. **Materials & Methods:** 80 women with gestational diabetes mellitus were enrolled. Patients were treated either medical nutritional therapy (MNT) or combined insulin along with MNT. All women were asked to drink 75 g of anhydrous glucose dissolved in 300 mL of water over 5–10 min period. After 2 hours of glucose ingestion, blood glucose levels were measured using plasma calibrated glucometers. **Results:** There were 24 subjects in GDM with PE and 20 in GDM without PE in primi, 10 in GDM with PE and without PE in 2<sup>nd</sup> gravida, 4 in GDM with PE and 6 in GDM without PE in 3<sup>rd</sup> and 2 in GDM with PE and 4 in GDM without PE in 4<sup>th</sup> and above gravida. GDM with PE and GDM without PE had 1st hour OGTT of 198.2 mg/dl and 170.2 mg/dl, 2 hours OGTT was 170.4 mg/dl and 152.6 mg/dl, weight gain was 17.6 kilogram and 12.4 kilogram and HbA1c levels was 7.32% and 7.06% respectively. The difference was significant (P< 0.05). **Conclusion:** Early detection of gestational diabetes with good antenatal care and strict glycemic control may decrease the chances of preeclampsia.

**Key words:** gestational diabetes, Pregnancy, antenatal care

**Corresponding author:** Amit Varshney, Assistant Professor, Department of General Medicine, Sakshi Medical College, Guna, Madhya Pradesh, India

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**INTRODUCTION**

Gestational diabetes mellitus (GDM) is defined as glucose intolerance of variable degree with onset or first recognition during pregnancy.<sup>1,2</sup> GDM can cause prenatal and maternal complications for women such as: preeclampsia, cesarean delivery, and an increased risk of developing type 2 diabetes later in life. Children born to women with GDM have increased risk of developing macrosomia, childhood obesity, pre-diabetes, and type 2 diabetes.<sup>3</sup> Diagnostic criteria have been developed by numerous associations such as: O' Sullivan; American Diabetes Association (ADA); Australian Diabetes in Pregnancy Society (ADIPS); Carpenter-Coustan (CC); International Association of the Diabetes and Pregnancy Study Groups (IADPSG); International Classification of Diseases (ICD) etc.<sup>4</sup> These diagnostic criteria vary in terms of screening methods and screening threshold. Diagnosis of GDM primarily depends on the results of an oral glucose tolerance test (OGTT).<sup>5</sup> The OGTT can be carried out via a 75-g two-hour test or a 100-g three-hour OGTT. The 75-g two-hour OGTT is a one-step approach, while the 100-g three-hour OGTT is usually implemented as the second step of a two-step approach.<sup>6</sup> A diagnosis of

GDM is made when one glucose value is elevated for the 75-g two-hour OGTT. Despite the presence of multiple diagnostic criteria to diagnose GDM, to date, there has been a degree of uncertainty around the optimum thresholds for a positive test.<sup>6</sup> The present study was conducted to evaluate cases of gestational diabetes mellitus.

**MATERIALS & METHODS**

The present study comprised of 80 women with gestational diabetes mellitus. All were enrolled with written consent.

Patient's history was taken and general physical examination was conducted. Patients were treated either medical nutritional therapy (MNT) or combined insulin along with MNT. Routine blood sugar, blood pressure, and weight gain was checked during each visit. All women were asked to drink 75 g of anhydrous glucose dissolved in 300 mL of water over 5–10 min period. After 2 hours of glucose ingestion, blood glucose levels were measured using plasma calibrated glucometers. A blood sugar level equal to 140 mg/dL or higher indicates GDM. Results were assessed statistically. P value less than 0.05 was considered significant.

**RESULTS****Table I Distribution of subjects**

Gravida	GDM with pre- eclampsia	GDM without pre- eclampsia	P value
Primi	24	20	0.21
2 <sup>nd</sup>	10	10	1

3 <sup>rd</sup>	4	6	0.91
4 <sup>th</sup> or above	2	4	0.94

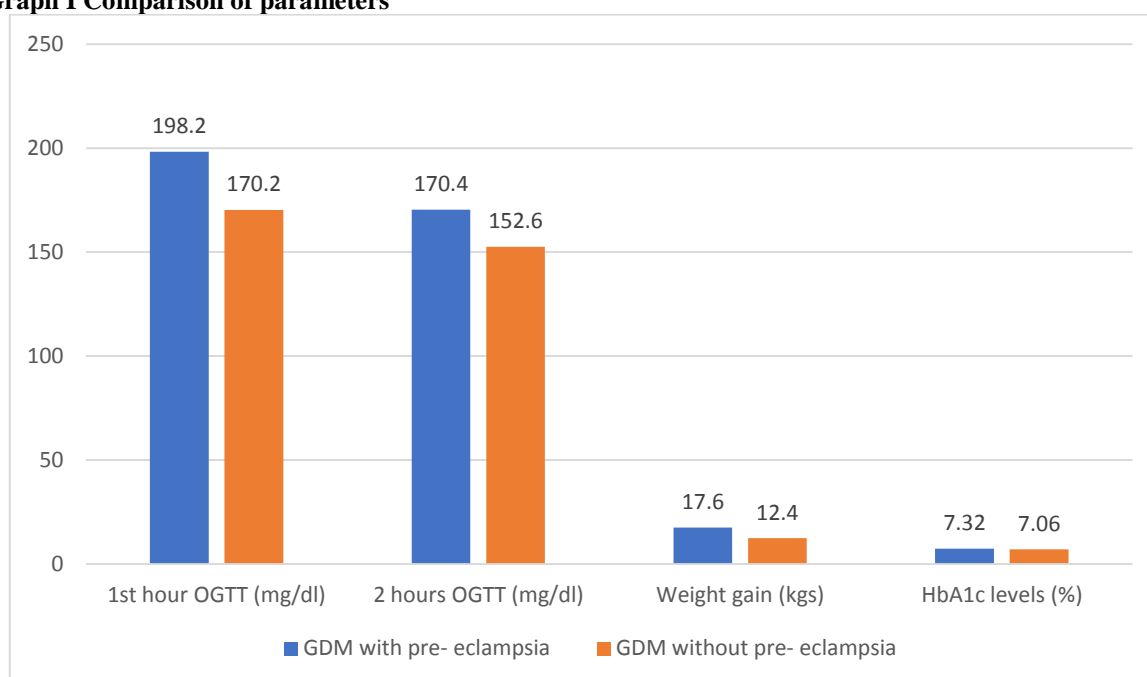
Table I shows that there were 24 subjects in GDM with PE and 20 in GDM without PE in primi, 10 in GDM with PE and without PE in 2<sup>nd</sup> gravida, 4 in GDM with PE and 6 in GDM without PE in 3<sup>rd</sup> and 2 in GDM with PE and 4 in GDM without PE in 4<sup>th</sup> and above gravida. The difference was non-significant ( $P > 0.05$ ).

**Table II Comparison of parameters**

Parameters	GDM with pre-eclampsia	GDM without pre-eclampsia	P value
1 <sup>st</sup> hour OGTT (mg/dl)	198.2	170.2	0.12
2 hours OGTT (mg/dl)	170.4	152.6	0.51
Weight gain (kgs)	17.6	12.4	0.05
HbA1c levels (%)	7.32	7.06	0.16

Table II, graph I shows that GDM with PE and GDM without PE had 1st hour OGTT of 198.2 mg/dl and 170.2 mg/dl, 2 hours OGTT was 170.4 mg/dl and 152.6 mg/dl, weight gain was 17.6 kilogram and 12.4 kilogram and HbA1c levels was 7.32% and 7.06% respectively. The difference was significant ( $P < 0.05$ ).

**Graph I Comparison of parameters**



**DISCUSSION**

Gestational diabetes mellitus (GDM) is the occurrence of hyperglycemia that manifests during pregnancy in patients who have not been previously diagnosed with diabetes.<sup>7</sup> However, no international consistent GDM diagnostic criteria have been established for long time.<sup>8</sup> Glucose intolerance or high blood sugar detected for the first-time during pregnancy is known as gestational diabetes mellitus (GDM).<sup>9</sup> Worldwide GDM is a significant public health problem. GDM both leads to adverse foetal health outcomes in the form of neonatal jaundice, stillbirths, macrosomia and also affects maternal health.<sup>10,11</sup> The GDM leads to maternal complications such as pre-eclampsia, the need for caesarean section and respiratory distress. Even GDM mother's risk of developing diabetes is up by 10% immediately after delivery. Evidence suggests that children born to GDM mothers are nearly four to eight times more likely to develop diabetes in later life compared with their siblings born to the same parent

with no GDM.<sup>12,13</sup> The present study was conducted to evaluate cases of gestational diabetes mellitus.

In this study, there were 24 subjects in GDM with PE and 20 in GDM without PE in primi, 10 in GDM with PE and without PE in 2<sup>nd</sup> gravida, 4 in GDM with PE and 6 in GDM without PE in 3<sup>rd</sup> and 2 in GDM with PE and 4 in GDM without PE in 4<sup>th</sup> and above gravida. Miao et al<sup>14</sup> in their study 84 patients who were diagnosed with hyperglycemia during pregnancy were enrolled in the study. For patients in Group A, GDM was diagnosed using both the National Diabetes Data Group (NDDG) and the IADPSG criteria, while patients in Group B, gestational impaired glucose tolerance (GIGT) was diagnosed using the NDDG criteria while GDM was diagnosed based on the IADPSG criteria. Anthropometric data, glucose metabolism, lipid profiles,  $\beta$  cell function, and insulin resistance index were evaluated and compared to baseline after 5- to 6-year postpartum period. Patients in group A had significantly higher oral glucose

tolerance test (OGTT) fasting, 2-hour and 3-hour plasma glucose levels compared to patients in group B at 24 to 28 weeks of gestation ( $P < .05$ ). No significant differences were observed between the groups for anthropometric data, postpartum abnormal glucose metabolism (50.91% vs 44.83%,  $P = .596$ ), type 2 diabetes mellitus (T2DM) (16.36% vs 3.45%,  $P = .167$ ), lipid profiles,  $\beta$  cell function (homeostasis model assessment  $\beta$ -cell function index (HOMA- $\beta$ ) 1.04 vs 0.99,  $P = .935$ ) and insulin resistance (homeostasis model assessment insulin resistance index).

We found that GDM with PE and GDM without PE had 1st hour OGTT of 198.2 mg/dl and 170.2 mg/dl, 2 hours OGTT was 170.4 mg/dl and 152.6 mg/dl, weight gain was 17.6 kilogram and 12.4 kilogram and HbA1c levels was 7.32% and 7.06% respectively. Kashyap et al<sup>15</sup> evaluated the rate of preeclampsia with the severity of gestational diabetes mellitus. They selected 50 pregnant women diagnosed with gestational diabetes from the department of gynecology. The subjects for followed up till the delivery of child for development of preeclampsia. An informed written consent was obtained from the participating subjects. the present study, a total of 50 subjects who were diagnosed with GDM were included. After routine blood work and general examination, preeclampsia was seen 17 patients. The results were compared and were found to be statistically non-significant. Primi gravida was seen in 16 patients, second gravid was seen in 14 patients, third gravid was seen in 11 patients and fourth and above gravid was seen in 9 patients.

## CONCLUSION

Authors found that early detection of gestational diabetes with good antenatal care and strict glycemic control may decrease the chances of preeclampsia.

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