

Original Research

Assessment of gestational diabetes mellitus and rate of pre- eclampsia

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ABSTRACT:

Background: GDM both leads to adverse foetal health outcomes in the form of neonatal jaundice, stillbirths, macrosomia and also affects maternal health. The present study was conducted to assess cases of gestational diabetes mellitus. **Materials & Methods:** 72 women with gestational diabetes confirmed using International Association of Diabetes and Pregnancy study groups [IADPSG]-2011 and American Diabetes Association [ADA] recommendations were included. A blood sugar level equal to 140 mg/dL or higher indicates GD. **Results:** There were 15 subjects in GDM with PE and 22 in GDM without PE in primi, 10 in GDM with PE and without PE in 2nd gravida, 3 in GDM with PE and 6 in GDM without PE in 3rd and 2 in GDM with PE and 4 in GDM without PE in 4th and above gravida. GDM with PE and GDM without PE had 1st hour OGTT of 199.2 mg/dl and 174.2 mg/dl, 2 hours OGTT was 172.4 mg/dl and 158.6 mg/dl, weight gain was 17.2 Kilogram and 12.6 Kilogram and HbA1c levels was 7.62% and 7.01 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: antenatal care, glycemic control, preeclampsia.

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INTRODUCTION

Glucose intolerance or high blood sugar detected for the first time during pregnancy is known as gestational diabetes mellitus (GDM).¹ 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. 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.² 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.³

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.⁴ 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).⁵ 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.⁶ 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.⁷ The present study was conducted to assess cases of gestational diabetes mellitus.

MATERIALS & METHODS

The present study was conducted among 72 women with gestational diabetes confirmed using

International Association of Diabetes and Pregnancy study groups [IADPSG]-2011 and American Diabetes Association [ADA] recommendations.

Patient's details and history were taken and general physical and local examination was conducted. Patients were put on treatment according to the blood glucose levels; they were treated either medical Nutritional therapy (or) combined (Insulin along with MNT). Routine blood work, 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, we measured blood glucose levels using plasma calibrated glucometers. A blood sugar level equal to 140 mg/dL or higher indicates GD. Statistical analysis was performed using chi-square test. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of subjects based on gravida and eclampsia

Gravida	GDM with pre- eclampsia	GDM without pre- eclampsia	P value
Primi	15	22	0.05
2 nd	10	10	1
3 rd	3	6	0.02
4 th or above	2	4	0.02

Table I, Graph I shows that there were 15 subjects in GDM with PE and 22 in GDM without PE in primi, 10 in GDM with PE and without PE in 2nd gravida, 3 in GDM with PE and 6 in GDM without PE in 3rd and 2 in GDM with PE and 4 in GDM without PE in 4th and above gravida. The difference was significant (P< 0.05).

Graph I Distribution of subjects based on gravida and eclampsia

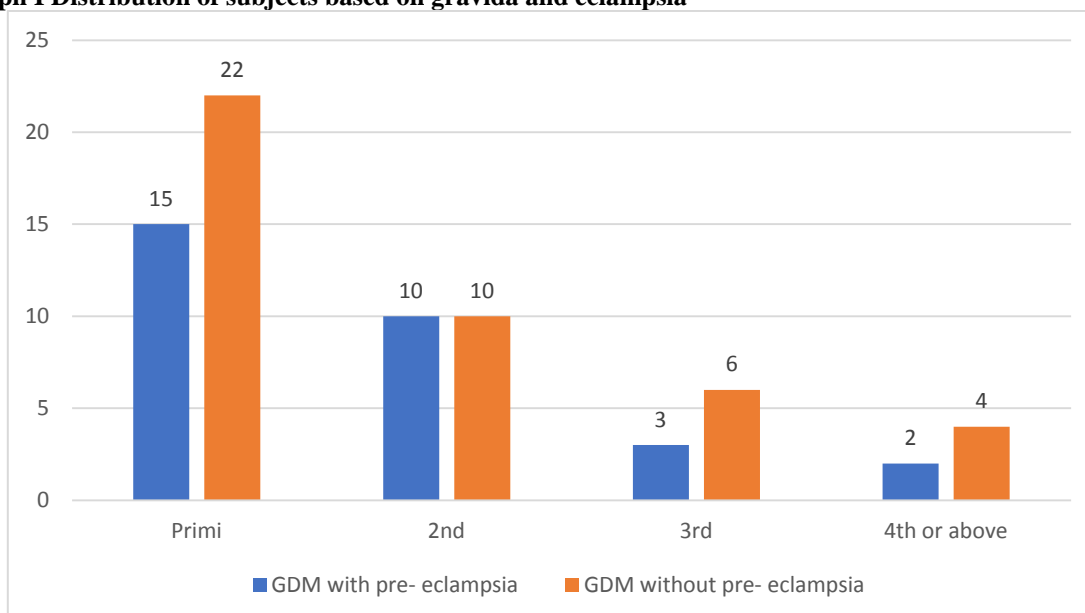
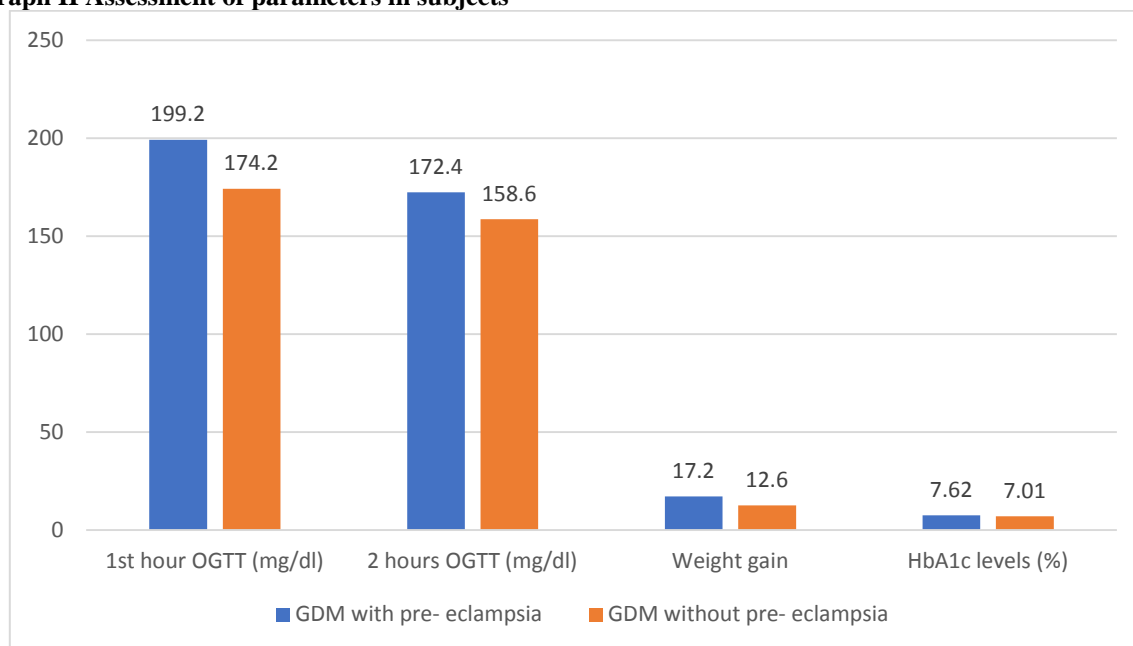


Table II Assessment of parameters in subjects

Parameters	GDM with pre- eclampsia	GDM without pre- eclampsia	P value
1 st hour OGTT (mg/dl)	199.2	174.2	0.12
2 hours OGTT (mg/dl)	172.4	158.6	0.51
Weight gain	17.2	12.6	0.05
HbA1c levels (%)	7.62	7.01	0.16

Table II, graph II shows that GDM with PE and GDM without PE had 1st hour OGTT of 199.2 mg/dl and 174.2 mg/dl, 2 hours OGTT was 172.4 mg/dl and 158.6 mg/dl, weight gain was 17.2 Kilogram and 12.6 Kilogram and HbA1c levels was 7.62% and 7.01 respectively. The difference was significant (P< 0.05).

Graph II Assessment of parameters in subjects

DISCUSSION

Gestational diabetes mellitus (GDM) is defined as any degree of dysglycaemia that occurs for the first time or is first detected during pregnancy. It has become a global public health burden.⁸ GDM is one of the leading causes of mortality and morbidity for both the mother and the infant worldwide. Mothers with GDM are at risk of developing gestational hypertension, preeclampsia and caesarean section.⁹ Apart from this, women with a history of GDM are also at significantly higher risk of developing subsequent type 2 diabetes mellitus (T2DM) and cardiovascular diseases.¹⁰ Babies born from GDM women are at risk of being macrosomic, may suffer from more congenital abnormalities and have a greater propensity of developing neonatal hypoglycaemia, and T2DM later in life.¹¹ The present study was conducted to assess cases of gestational diabetes mellitus.

We found that there were 72 subjects with GDM. 42 were having GDM with pre- eclampsia (PE) and 30 were having GDM without pre- eclampsia (PE). Lee et al¹² in their study eighty-four studies with STROBE score ≥ 14 were included. The pooled prevalence of GDM in Asia was 11.5% (95% CI 10.9–12.1). There was considerable heterogeneity ($I^2 > 95\%$) in the prevalence of GDM in Asia, which is likely due to differences in diagnostic criteria, screening methods and study setting. Meta-analysis demonstrated that the risk factors of GDM include history of previous GDM (OR 8.42, 95% CI 5.35–13.23); macrosomia (OR 4.41, 95% CI 3.09–6.31); and congenital anomalies (OR 4.25, 95% CI 1.52–11.88). Other risk factors include a BMI ≥ 25 kg/m² (OR 3.27, 95% CI 2.81–3.80); pregnancy-induced hypertension (OR 3.20, 95% CI 2.19–4.68); family history of diabetes (OR 2.77, 2.22–3.47); history of stillbirth (OR 2.39, 95%

CI 1.68–3.40); polycystic ovary syndrome (OR 2.33, 95% CI 1.72–3.17); history of abortion (OR 2.25, 95% CI 1.54–3.29); age ≥ 25 (OR 2.17, 95% CI 1.96–2.41); multiparity ≥ 2 (OR 1.37, 95% CI 1.24–1.52); and history of preterm delivery (OR 1.93, 95% CI 1.21–3.07).

We found that there were 15 subjects in GDM with PE and 22 in GDM without PE in primi, 10 in GDM with PE and without PE in 2nd gravida, 3 in GDM with PE and 6 in GDM without PE in 3rd and 2 in GDM with PE and 4 in GDM without PE in 4th and above gravida. Kashyap et al¹³ 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.

We observed that GDM with PE and GDM without PE had 1st hour OGTT of 199.2 mg/dl and 174.2 mg/dl, 2 hours OGTT was 172.4 mg/dl and 158.6 mg/dl, weight gain was 17.2 Kilogram and 12.6 Kilogram and HbA1c levels was 7.62% and 7.01 respectively. Goyal et al¹⁴ in their study 62 pregnant women diagnosed with gestational diabetes were taken and general physical and local examination was conducted. Assessment of HbA1c levels and 1st hour OGTT values was recorded. Gravida was primi in 10

and 12, 2nd in 4 and 15, 3rd in 6 and 8, 4th or above in 2 and 5 in GDM with pre- eclampsia and GDM without pre- eclampsia patients respectively. The mean 1st hour OGTT values in GDM with PE was 199.2 mg/dl and 172.4 mg/dl in GDM without PE and mean HbA1c levels was 7.90% and 7.12% in GDM with PE and in GDM without PE respectively. The difference was non-significant ($P > 0.05$).

CONCLUSION

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

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