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Original Research

Evaluation of gestational diabetes mellitus and pre- eclampsia among pregnant women

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ABSTRACT:

Background: Gestational diabetes mellitus (GDM) and preeclampsia (PE) are common complications in pregnancy with similar risk factors, including obesity, advanced age, and multiple pregnancy. The present study was conducted to evaluate cases of gestational diabetes mellitus and pre- eclampsia among pregnant women.

Materials & Methods: 90 women with gestational diabetes were included. A blood sugar level equal to 140 mg/dL or higher indicates GDM. Group I comprised of subjects with GDM with PE and group II were GDM without PE.

Results: There were 25 subjects in GDM with PE and 22 in GDM without PE in primi, 15 in GDM with PE and 12 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 5 in GDM without PE in 4th and above gravida. The difference was significant (P< 0.05). Group I and group II had 1st hour OGTT of 205.2 mg/dl and 170.2 mg/dl, 2 hours OGTT was 174.4 mg/dl and 161.6 mg/dl, weight gain was 18.2 kilogram and 14.6 kilogram and HbA1c levels was 7.82% and 7.04% respectively. The difference was significant (P< 0.05).

Conclusion: Gestational diabetes mellitus (GDM) and preeclampsia (PE) are common complications in pregnancy. Early detection of gestational diabetes with good antenatal care and strict glycemic control may decrease the chances of preeclampsia.

Key words: Gestational diabetes mellitus, preeclampsia, pregnant

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INTRODUCTION

Gestational diabetes mellitus (GDM) and preeclampsia (PE) are common complications in pregnancy with similar risk factors, including obesity, advanced age, and multiple pregnancy.[1] Moreover, in both GDM and PE, the pathophysiological processes involve oxidative stress, pro-inflammatory factor release, vascular endothelial dysfunction which all increase the risk of future maternal diabetes and cardiovascular disease thus, a correlation between GDM and PE may exist.[2,3]

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.[4] 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.[5]PE refers to new hypertension (systolic or diastolic blood pressure ≥140 or ≥90 mmHg, respectively) diagnosed at or after 20 weeks of gestation with proteinuria, or at least one other organ (kidney, liver, nervous system, blood system, and uteroplacenta) dysfunction.[6] The present study was conducted to evaluate cases of gestational diabetes mellitus and pre- eclampsia among pregnant women.

MATERIALS & METHODS

The present study comprised of 90 women with gestational diabetes. All gave their written consent for the participation in the study.

Data such as name, age etc. was recorded. GDM was diagnosed using International Association of Diabetes and Pregnancy study groups [IADPSG]-2011 and American Diabetes Association [ADA] recommendations. 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 GDM. Group I comprised of subjects with GDM with PE and group II were GDM without PE. Results thus obtained were statistically analysed. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of subjects

Gravida	Group I	Group II	P value
Primi	25	22	0.91
2nd	15	12	0.72
3rd	3	6	0.04
4th or above	2	5	0.01

Table I, graph I shows that there were 25 subjects in GDM with PE and 22 in GDM without PE in primi, 15 in GDM with PE and 12 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 5 in GDM without PE in 4th and above gravida. The difference was significant (P< 0.05).

Graph I Distribution of subjects

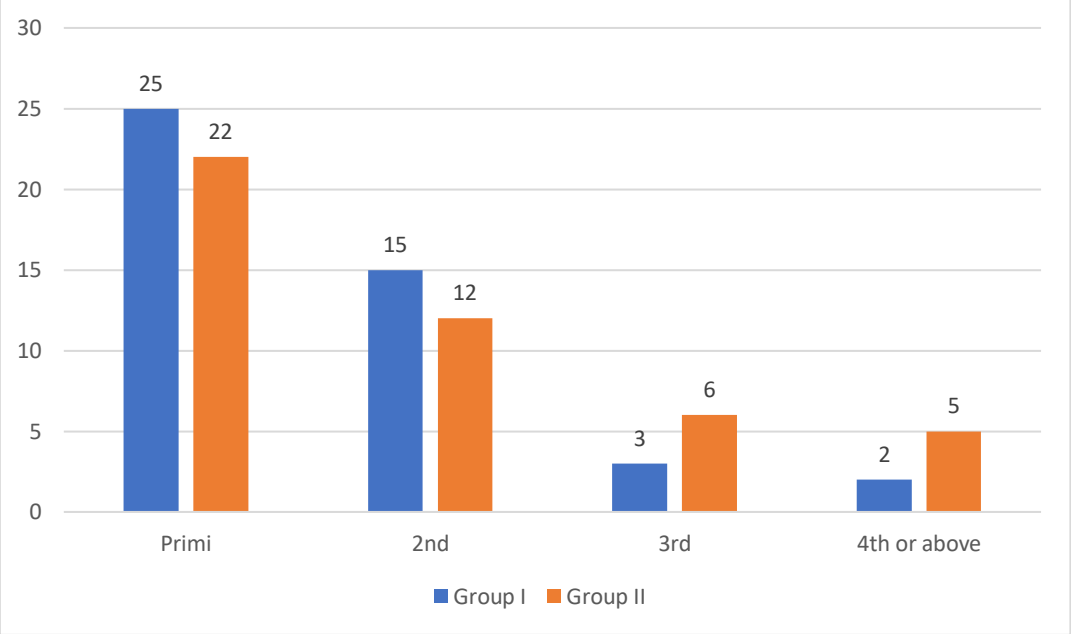
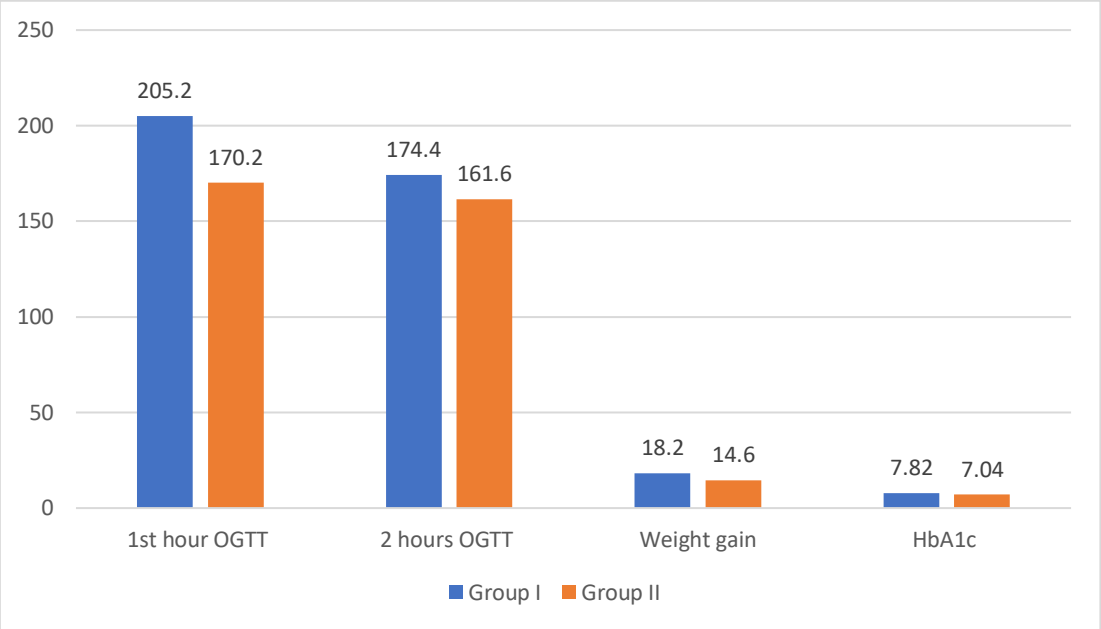


Table II Assessment of parameters

Parameters	Group I	Group II	P value
1st hour OGTT	205.2	170.2	0.05
2 hours OGTT	174.4	161.6	0.82
Weight gain	18.2	14.6	0.04
HbA1c	7.82	7.04	0.91

Table II, graph II shows that group I and group II had 1st hour OGTT of 205.2 mg/dl and 170.2 mg/dl, 2 hours OGTT was 174.4 mg/dl and 161.6 mg/dl, weight gain was 18.2 kilogram and 14.6 kilogram and HbA1c levels was 7.82% and 7.04% respectively. The difference was significant (P< 0.05).

Graph II Assessment of parameters



DISCUSSION

Glucose intolerance or high blood sugar detected for the first time during pregnancy is known as gestational diabetes mellitus (GDM).[7]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.[8]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.[9] 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.[10]The present study was conducted to evaluate cases of gestational diabetes mellitus and pre- eclampsia among pregnant women.

We found that there were 25 subjects in GDM with PE and 22 in GDM without PE in primi, 15 in GDM with PE and 12 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 5 in GDM without PE in 4th and above gravida. Kashyap et al[11] evaluated the rate of preeclampsia with the severity of gestational diabetes mellitus in 50 pregnant women diagnosed with gestational diabetes from the department of gynecology. 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 found that group I and group II had 1st hour OGTT of 205.2 mg/dl and 170.2 mg/dl, 2 hours OGTT was 174.4 mg/dl and 161.6 mg/dl, weight gain was 18.2 kilogram and 14.6 kilogram and HbA1c levels was 7.82% and 7.04% respectively. Goyal et al[12] in their study 62 pregnant women diagnosed with gestational diabetes were taken and found that 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.

Lee et al[13] in their study demonstrated that the risk factors of GDM include history of previous GDM; macrosomia and congenital anomalies. Other risk factors include a BMI ≥25 kg/m2; pregnancy-induced hypertension; family history of diabetes; history of stillbirth; polycystic ovary syndrome; history of abortion; age ≥ 25; multiparity ≥2 and history of preterm delivery.

Rowan et al[14]evaluatedeffect of metformin for GDM and revealed that obesity was not associated with PE in metformin- and/or insulin-treated women, but the incidence of PE was significantly associated with being overweight. The reason for this result may be related to the drug treatment and blood glucose control; furthermore, aspirin was not excluded as a confounding factor. Langer et al[15] in their study considering the level of blood glucose control and treatment methods showed that obesity was only related to PE in insulin treatment group with poor blood glucose control, but not in diet treatment group (regardless of blood glucose control) and insulin treatment group with good blood glucose control. Thus, the effect of pre pregnancy BMI on PE in women with GDM may be also related to blood glucose level and treatment methods.

CONCLUSION

Authors found that gestational diabetes mellitus (GDM) and preeclampsia (PE) are common

complications in pregnancy. Early detection of gestational diabetes with good antenatal care and strict glycemic control may decrease the chances of preeclampsia.

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