

## *Original Article*

### **Severity of Gestational diabetes and rate of preeclampsia**

Monika Kashyap

Assistant Professor, Department of Obstetrics and Gynaecology, Mulayam Singh Yadav Medical College, Meerut, Uttar Pradesh, India

#### **ABSTRACT:**

**Background:** Gestational diabetes mellitus (GDM) is defined as glucose intolerance first recognized during pregnancy. GDM has been reported to affect between 1.4% to 12.3% of pregnancies, and its prevalence is increasing and parallels the rising incidence of type 2 diabetes mellitus worldwide. **Aim of the study:** To evaluate the rate of preeclampsia with the severity of gestational diabetes mellitus. **Materials and methods:** The study was conducted in the Department of Gynecology and Obstetrics of the medical institution. The ethical clearance for study protocol was obtained from ethical committee of the institution. For the study, we 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. **Results:** 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:** From the results of the present study, this can be concluded that arly detection of Gestational diabetes with good antenatal care and strict glycemc control may decrease the incidence of preeclampsia.

**Key words:** Gestational diabetes mellitus, preeclampsia, pregnancy.

Received: 15 September 2018

Revised: 17 November 2018

Accepted: 19 November 2018

**Corresponding author:** Dr. Monika Kashyap, B-804, Venkateshwara Residency, opposite LLRM Medical College, Garh Road, Meerut, Uttar Pradesh, India

**This article may be cited as:** Kashyap M. Severity of Gestational diabetes and rate of preeclampsia. J Adv Med Dent Scie Res 2018;6(12):31-34.

#### **INTRODUCTION:**

Gestational diabetes mellitus (GDM) is defined as glucose intolerance first recognized during pregnancy. GDM has been reported to affect between 1.4% to 12.3% of pregnancies, and its prevalence is increasing and parallels the rising incidence of type 2 diabetes mellitus worldwide.<sup>1</sup> Risk factors for ,developing GDM in pregnancy include obesity, previously GDM, glycosuria, family history, ethnicity and hypertension. Arguably, one of the strongest non-modifiable risk factor for GDM relates to the woman's ethnicity. Preeclampsia is a leading cause of maternal and fetal morbidity and mortality. In developed countries, this syndrome affects 2-7% of pregnancies in non-diabetic women.<sup>3</sup> Type 1 diabetes, type 2 diabetes and gestational diabetes further increase preeclampsia risk. Preeclampsia is diagnosed in women presenting with new onset

hypertension and proteinuria during the second half of pregnancy.<sup>4</sup> New guidelines from the American College of Obstetrics and Gynecology (ACOG) indicate that preeclampsia can also be diagnosed in the absence of proteinuria in hypertensive women with pulmonary edema, progressive renal insufficiency, impaired liver function, thrombocytopenia, or new onset cerebral or visual disturbances.<sup>5, 6</sup> Hence, the present study was conducted to evaluate the rate of preeclampsia with the severity of gestational diabetes mellitus.

#### **MATERIALS AND METHODS:**

The study was conducted in the Department of Gynecology and Obstetrics of the medical institution. The ethical clearance for study protocol was obtained from ethical committee of the institution. For the study, we 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. Patient with history of preeclampsia in previous pregnancy and having chronic hypertension, overt diabetes mellitus, thyroid disorders, heart diseases and anemia were excluded from the study. Patients were diagnosed with the test according to International Association of Diabetes and Pregnancy study groups [IADPSG]-2011 and American Diabetes Association [ADA] recommendations. After confirmation of the diagnosis, 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. The subjects were followed till 6 weeks postnatally.

The statistical analysis of the data was done using SPSS version 11.0 for windows. Chi-square and Student’s t-test

were used for checking the significance of the data. A p-value of 0.05 and lesser was defined to be statistical significant.

**RESULTS:**

In 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. Table 1 shows the comparison of groups at the time of detection of GDM. 1st hour OGTT values in patients with GDM with PE was at 198.21 mg/dl and in patients with GDM alone was at 176.21 mg/dl. 2nd hour OGTT values for patients with GDM with PE was at 178.25 mg/dl and GDM alone patients was at 160.12 mg/dl. HbA1c levels for GDM with PE patients was at 7.89% and GDM alone patients was 7.02 %. The results were compared and were found to be statistically non-significant. Table 2 shows the distribution of cases according to Gravida and incidence of Preeclampsia. 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.

Table 1: Comparison of groups at the time of detection of GDM

	Sample	Number of subjects	Mean values	p-value
1 <sup>st</sup> hour OGTT values (mg/dl)	GDM with PE	17	198.21	0.2
	GDM alone	33	176.21	
2 <sup>nd</sup> hour OGTT values (mg/dl)	GDM with PE	17	178.25	0.09
	GDM alone	33	160.12	
HbA1c levels	GDM with PE	17	7.89	0.81
	GDM alone	33	7.02	
Weight gain	GDM with PE	17	17.38	0.31
	GDM alone	33	12.98	

Table 2: Distribution of cases according to Gravida and incidence of Preeclampsia

Gravida	No. of cases	GDM with PE (n=17)	GDM without PE(n=33)
Primi	16	8	9
Second gravid	14	3	14
Third gravid	11	4	6
Fourth and above gravid	9	2	4
Total	50	17	33

**DISCUSSION:**

In 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. 1st hour OGTT values in patients with GDM with PE was at 198.21 mg/dl and in patients with GDM alone was at 176.21 mg/dl. 2nd hour OGTT values for patients with GDM with PE was at 178.25 mg/dl and GDM alone patients was at 160.12 mg/dl. HbA1c levels for GDM with PE patients was at 7.89% and GDM alone patients was 7.02 %. 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. The results were compared with previous studies. Sibai BM determined the frequencies of preeclampsia and adverse neonatal outcomes among women with pregestational diabetes. This was a prospective observation of pregnancy outcomes among 462 women with pregestational diabetes mellitus and singleton pregnancies who were enrolled in a multicenter trial to compare low-dose aspirin with placebo for preeclampsia prevention. The main outcome measures were preeclampsia and neonatal outcomes. Among 462 women with pregestational diabetes, 92 (20%) had preeclampsia. Preeclampsia frequency rose significantly with increasing severity of diabetes according to White classification. Preeclampsia was also more common among women who had

proteinuria at baseline. Frequency of preterm delivery at <35 weeks' gestation rose greatly with increasing severity of diabetes. Women with proteinuria at baseline were significantly more likely to be delivered at <35 weeks' gestation and to have small-for-gestational-age infants, and they were less likely to have large-for-gestational-age infants. They concluded that among women with pregestational diabetes mellitus, the frequency of preeclampsia rose with increasing severity of diabetes. Proteinuria early in pregnancy was associated with marked increases in adverse neonatal outcomes independent of preeclampsia development. Caritis S et al conducted a double-blind, randomized, placebo-controlled trial in four groups of pregnant women at high risk for preeclampsia, including 471 women with pregestational insulin-treated diabetes mellitus, 774 women with chronic hypertension, 688 women with multifetal gestations, and 606 women who had had preeclampsia during a previous pregnancy. The women were enrolled between gestational weeks 13 and 26 and received either 60 mg of aspirin or placebo daily. Outcome data were obtained on all but 36 of the 2539 women who entered the study. The incidence of preeclampsia was similar in the 1254 women in the aspirin group and the 1249 women in the placebo group. The incidences in the aspirin and placebo groups for each of the four high-risk categories were also similar: for women with pregestational diabetes mellitus, the incidence was 18 percent in the aspirin group and 22 percent in the placebo group; for women with chronic hypertension, 26 percent and 25 percent; for those with multifetal gestations, 12 percent and 16 percent; and for those with preeclampsia during a previous pregnancy, 17 percent and 19 percent. In addition, the incidences of perinatal death, preterm birth, and infants small for gestational age were similar in the aspirin and placebo groups. In their study, low-dose aspirin did not reduce the incidence of preeclampsia significantly or improve perinatal outcomes in pregnant women at high risk for preeclampsia.<sup>7,8</sup>

Lee J et al determined whether women with preeclampsia have an increased risk of GDM in a subsequent pregnancy. Study data were collected from the Korea National Health Insurance Claims Database of the Health Insurance Review and Assessment Service for 2007-2012. Patients who had their first delivery in 2007 and a subsequent delivery between 2008 and 2012 in Korea were enrolled. A model of multivariate logistic regression analysis was performed with GDM as the final outcome to evaluate the risk of GDM in the second pregnancy. Among the 252,276 women who had their first delivery in 2007, 150,794 women had their second delivery between 2008 and 2012. On the multivariate regression analysis, women with preeclampsia alone in the first pregnancy had an increased risk of GDM in the second pregnancy when compared with women who had neither of these conditions in their first pregnancy. Women with GDM alone in the first pregnancy were at an increased risk for GDM in the second pregnancy. The co-

presence of preeclampsia and GDM in the first pregnancy further increased the risk of GDM in the second pregnancy. Their study showed that a history of preeclampsia may serve as an additional risk factor for GDM in a subsequent pregnancy. Sibai BM et al also compare the rates of indicated and spontaneous preterm delivery among women with chronic hypertension or pregestational diabetes mellitus with the rates among healthy women. This was a secondary analysis of data from healthy women with singleton gestations enrolled in a prospective observational study for prediction of preterm delivery, women with pregestational diabetes mellitus requiring insulin therapy, and women with chronic hypertension. The two latter groups were enrolled in a randomized multicenter trial for prevention of preeclampsia. The main outcome measures were rates of preterm delivery, either spontaneous or indicated, and neonatal outcomes. The overall rates of preterm delivery were significantly higher among women with diabetes mellitus (38%) and hypertension (33.1%) than among control women (13.9%). Rates were also significantly higher for delivery at <35 weeks' gestation. Women with diabetes mellitus had significantly higher rates of both indicated preterm delivery and spontaneous preterm delivery than did women in the control group. In addition, they had significantly higher rates of both indicated preterm delivery and spontaneous preterm delivery at <35 weeks' gestation than did control women. Compared with control women those with chronic hypertension had higher rates of indicated preterm delivery at both <37 weeks' gestation and at <35 weeks' gestation, but there were no differences in rates of spontaneous preterm delivery. They concluded that the increased rate of preterm delivery among women with chronic hypertension relative to control women was primarily an increase in indicated preterm delivery, whereas the rates of both spontaneous and indicated preterm delivery were increased among women with pregestational diabetes mellitus.<sup>9,10</sup>

#### CONCLUSION:

From the results of the present study, it can be concluded that early detection of Gestational diabetes with good antenatal care and strict glycemic control may decrease the incidence of preeclampsia.

#### REFERENCES:

1. World Health Organization. World Health Report: Make Every Mother, and Child Count. Geneva: WHO; 2005.
2. Altman D, Carroli G, Duley L, Farrell B, Moodley J, Neilson J, et al. Do women with pre-eclampsia, and their babies, benefit from magnesium sulphate? The Magpie Trial: a randomised placebo-controlled trial. *Lancet*. 2002;359(9321):1877-90. doi:S0140673602087780 [pii]
3. Ness RB, Roberts JM. Heterogeneous causes constituting the single syndrome of preeclampsia: a hypothesis and its implications. *American Journal of Obstetrics and Gynecology*. 1996;175(5):1365-1370.

4. Redman CW, Roberts JM. Management of pre-eclampsia. *The Lancet*. 1993;341(8858):1451–1454.
5. Roberts JM. Preventing pre-eclampsia. *The Lancet*. 1996;348(9023):281–282.
6. Roberts JM, Cooper DW. Pathogenesis and genetics of pre-eclampsia. *The Lancet*. 2001;357(9249):53–56.
7. Sibai BM, Caritis S, Hauth J, Lindheimer M, VanDorsten JP, MacPherson C, Klebanoff M, Landon M, Miodovnik M, Paul R, Meis P, Dombrowski M, Thurnau G, Roberts J, McNellis D. Risks of preeclampsia and adverse neonatal outcomes among women with pregestational diabetes mellitus. National Institute of Child Health and Human Development Network of Maternal-Fetal Medicine Units. *Am J Obstet Gynecol*. 2000 Feb;182(2):364-9.
8. Caritis S, Sibai B, Hauth J, Lindheimer MD, Klebanoff M, Thom E, VanDorsten P, Landon M, Paul R, Miodovnik M, Meis P, Thurnau G. Low-dose aspirin to prevent preeclampsia in women at high risk. National Institute of Child Health and Human Development Network of Maternal-Fetal Medicine Units. *N Engl J Med*. 1998 Mar 12;338(11):701-5.
9. Lee J, Ouh YT, Ahn KH, Hong SC, Oh MJ, Kim HJ, Cho GJ. Preeclampsia: A risk factor for gestational diabetes mellitus in subsequent pregnancy. *PLoS One*. 2017 May 22;12(5):e0178150. doi: 10.1371/journal.pone.0178150. eCollection 2017.
10. Sibai BM, Caritis SN, Hauth JC, MacPherson C, VanDorsten JP, Klebanoff M, Landon M, Paul RH, Meis PJ, Miodovnik M, Dombrowski MP, Thurnau GR, Moawad AH, Roberts J. Preterm delivery in women with pregestational diabetes mellitus or chronic hypertension relative to women with uncomplicated pregnancies. The National institute of Child health and Human Development Maternal- Fetal Medicine Units Network. *Am J Obstet Gynecol*. 2000 Dec;183(6):1520-4.

**Source of support:** Nil

**Conflict of interest:** None declared

This work is licensed under CC BY: *Creative Commons Attribution 3.0 License*.