

Pre-Eclampsia in Patients with Gestational Diabetes

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ABSTRACT

Aim: To determine the frequency of pre-eclampsia in patients with gestational diabetes, presenting to department of obstetrics and gynaecology of Nishtar Hospital, Multan.

Methods: This descriptive study was carried out in the Department of obstetrics and gynaecology Unit 2, Nishtar Hospital, Multan from June 2013 to December 2013. A total of 167 patients with gestational diabetes mellitus (GDM) were included in the study.

Results: Total number of patients with GDM was 167. Patient's age range was from 17 years to 38 years with mean age (\pm S.D) 26.8 ± 5.8 years. Mean height and weight were 158.89 ± 4.73 cm and 70.3 ± 8.2 kg respectively. BMI was 27.88 ± 3.26 kg/m². Mostly patients (49.1%) were having BMI in range of obesity (25.1 - 29.9 kg/m²). Gestational age at diagnosis of GDM was ranging from 21 weeks to 35 weeks of gestation with mean 25.52 ± 3.6 weeks. Mostly women were multigravida (62.3%), and remaining were primigravida (37.7%). Regarding family history, 31.1% females were having family history of hypertension, 24.6% were having diabetes mellitus, and 11.4% were having history of both hypertension and diabetes. There were 29.9% women without any significant family. Pre-eclampsia was noted in 15.6% of total patients with GDM and 84.4% patients remained free of this complication.

Conclusion: Pre-eclampsia was noted in 15.6% patients of gestational diabetes and female with BMI more than 25 kg/m² were having more tendency to develop this complication.

Keywords: Gestational diabetes mellitus, Preeclampsia, Glucose tolerance test.

INTRODUCTION

Gestational diabetes mellitus (GDM), a common medical complication of pregnancy, is defined as "any degree of glucose intolerance with onset or first recognition during pregnancy." It has been estimated that up to 6-7% of pregnancies are complicated by diabetes mellitus and that approximately 90% of these cases represent women with GDM^{1,2}. The prevalence of GDM varies worldwide and depends on the population being studied and the diagnostic tests employed^{3,4}. One of the most common complication of GDM is pre-eclampsia (PE), which is a human-pregnancy-specific disease defined as new hypertension (diastolic blood pressure of ≥ 90 mm Hg) and proteinuria (≥ 300 mg in 24 h) in a previously healthy woman at or after 20 weeks gestation^{5,6,7}. Pre-eclampsia is the most common medical complication of pregnancy (2-8%) whose incidence has continued to increase worldwide⁸. It accounts for about 50,000 deaths worldwide annually^{2,3,5}, and is associated with significant maternal morbidity and mortality, perinatal death, preterm birth and intrauterine growth retardation⁹. In Asia, nearly one tenth of all maternal deaths are associated with hypertensive disorders of pregnancy², whereas in Pakistan, 1 in 89 women die of maternal causes with pre-eclampsia and eclampsia as one of the major causes¹⁰.

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At present, the precise etiology of pre-eclampsia is unknown, thus limiting its prevention¹¹, but there are certain risk factors which appear to be associated with this condition. Diabetes (gestational/ pregestational), chronic hypertension and obesity are among the major factors, other include nulliparity, a family or own history of pre-eclampsia, adolescent pregnancy and conditions leading to hyperplacentation and large placentas (e.g. twin pregnancy)². Data suggest that women with gestational diabetes mellitus (GDM) are at much increased risk of pre-eclampsia^{12,13,14,15,16}.

A study at the Department of Obstetrics and Gynecology Bangkok Metropolitan Administration Medical College and Vajira Hospital by Phaloprakarn and Tangjitgamol showed that 9.6% patients of gestational diabetes developed pre-eclampsia¹⁷. While a study published in 2010, conducted at Karachi and Rawalpindi by Shamsiet al showed 12.4% results¹⁸.

Global prevalence of GDM has continuously increased over the past decades^{19,20}, this would certainly result in an increased number of pregnant women being at risk of diabetes-related complications including pre-eclampsia.

MATERIAL AND METHODS

This descriptive study was carried out in the Department of obstetrics and gynaecology Unit 2, Nishtar Hospital, Multan from June 2013 to December 2013. A total of 167 patients with

gestational diabetes mellitus (GDM) were included in the study.

RESULTS

Age range of the patients was from 15 to 45 years. Mostly patients were from the age group of 25 to 35 years of age followed by patients with age <25 years. Mean age±SD= 26.8±5.8 years. Gestational age at diagnosis of GDM was ranging from 21 weeks to 35 weeks of gestation with mean 25.52±3.6 weeks. Mostly women were multigravida (62.3%) and remaining were primigravida (37.7%).

In this study there were 167 patients included who were having gestational diabetes. Patient’s age range was from 17 years to 38 years with mean age (±S.D) 26.8±5.8 years. Mean height and weight were 158.89±4.73 cm and 70.3±8.2 kg respectively. BMI was 27.88±3.26 kg/m² as shown in table-1.

Mostly patients (49.1%) were having BMI in range of overweight (25.1-29.9kg/m²), 19.8% was having BMI in normal range (18.5-25kg/m²) and 31.1% was having BMI in range of obesity (>30 kg/m²) as shown in table-2. Pre-eclampsia was more common in obese patients who were having BMI >30 with P-value 0.007 (Table 3). Regarding family history, 31.1% females were having family history of hypertension, 24.6% were having diabetes mellitus, and 11.4% were having history of both hypertension and diabetes. There were 29.9% women without any significant family (Table 4). Past obstetrical history revealed that there were 16.8% women with previous history of gestational diabetes, 10.8% with hypertension in previous pregnancies, 7.8% with previous baby birth weight more than 4kg and 6.6% with previous polyhydramnias (Table 5).

Table 1: Descriptive Statistics 9n=167)

	MAX	MIN	MEAN	SD
Age (year)	17	38	26.808	5.8329
Weight(kg)	52	86	70.335	8.2510
Height(cm)	151	170	158.89	4.734
BMI (kg)	19.10	35.42	27.8843	3.26036
Gestation	21	35	25.52	3.607

Table 2: BMI in patients of GDM (n=167)

Weight(kg/m2)	BMI	Frequency	%age
Normal	18.5-2.5	33	19.8
Overweight	25.1-29.9	82	49.1
Obese	>30	52	31.1

Table 3: Pre-eclampsia (n-167)

	Pre-eclampsia		P value
	Yes	No	
Normal	01	32	0.027
Overweight	11	71	0.451
Obese	14	38	0.027

Table 4: Family history (n=167)

	Freq	%age	Cumulative %age
Hypertension	52	31.1	31.1
DM	41	24.6	55.7
No risk factor	50	29.9	85.6
Hypertension+diabetes	19	11.4	97.0
Missing	05	03.0	100.0

Table 5: Family history family history (n=167)

Family history	Pre-eclampsia		Total
	Yes	No	
Hypertension	08	44	52
DM	08	33	41
No risk factor	03	47	50
Hypertension+ diabetes	07	12	19
Missing	0	05	05

DISCUSSION

Gestational diabetes mellitus (GDM) is a common metabolic disorder that occurs during pregnancy. It has been estimated that up to 6-7% of pregnancies are complicated by diabetes mellitus and that approximately 90% of these cases represent women with GDM^{1,2}. GDM can cause significant problems, including maternal complications, perinatal complications, and metabolic disorders in offspring of mothers with GDM. One of maternal complication is preeclampsia (PE), which is a pregnancy-specific condition. Pre-eclampsia can then further worsen the pregnancy with GDM with high maternal and fetus mortality and morbidity. The association between these two conditions is unclear but the increasing trend of GDM worldwide demand to find out the exact situation. So this study was designed to determine the frequency of preeclampsia in women with gestational diabetes. Total 167 were included in this study who were diagnosed to be having gestational diabetes after doing a glucose tolerance test.

The age range was from 15 years to 45 years of age. The patients were mostly between 25 years to 35 years of age (52.1%), while 40.1% were below 25 years and 7.8% were over 35 years of age. Mean age±SD was 26.8±5.8 years. In these women 62.3% were multigravida while 37.7% were primigravida.

A study by Wendlandet al²² in 2008 also showed age distribution in their patients with age (±SD) 30.1±6.0 years. Phaloprakarnet al¹⁷ conducted a study for risk assessment of preeclampsia in women with gestational diabetes and they revealed the age of 32.2 (±5.2) years. In our study the mean age of patients were slightly younger than other two studies done earlier.

The BMI at the diagnosis of GDM was calculated and women were stratified in three groups. Mostly women were in overweight condition (BMI=25.1-29.9kg/m²), 31.1% women were obese

(BMI >30 kg/m²) and only 19.8% were with normal BMI. BMI > 30 was strongly associated with the pre-eclampsia in these women (p=0.007). These results are consistent with the international data as Phaloprakarn et al who showed first trimester BMI >27 kg/m² in 65% of women of GDM who developed PE¹⁷.

In our study, 31.1 % patients gave family history of hypertension, 24.6% with family history of DM and 11.4% were having both HTN and DM. Patients with history of both HTN and DM developed more pre-eclampsia (p=0.007) as compared to other risk factors in family history. This data is also comparable with international data as shown by Wendland et al²¹.

In our study total 15.6% women developed PE which is a significant number. Wendland et al²² found that their 6.1% patients of GDM developed PE.

CONCLUSION

Pre-eclampsia was noted in 15.6% patients of gestational diabetes and female with BMI more than 25 kg/m² were having more tendency to develop this complication.

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