

THE FREQUENCY OF GESTATIONAL DIABETES MELLITUS AND ASSOCIATED RISK FACTORS AT KHYBER TEACHING HOSPITAL PESHAWAR

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ABSTRACT

Objective: To find out the frequency of gestational diabetes among pregnant women at Khyber Teaching Hospital Peshawar and to explore associated risk factors.

Methodology: This cross sectional study was conducted at the department of Gynecology Khyber Teaching Hospital Peshawar from August 2013 to January 2014. All pregnant females who fulfill the selection criteria coming for their routine checkup after 24 weeks till 28 weeks were taken in our study by convenient sampling method. Informed consent was obtained from each patient and a questionnaire was administered by researcher herself. Data was analyzed by SPSS version 16. Association of gestational diabetes and risk factors was studied using chi-square test.

Results: A total of 190 pregnant women were included in our study. Frequency of patients diagnosed as gestational diabetes mellitus on the basis of GTT was 50(26.3%). Risk factors included in the study were significantly associated with development of GDM age of patient (.00), body mass of index (.00), polycystic ovarian syndrome (.00), previous history of gestational diabetes mellitus (.00), previous history of macrosomic baby (.00), and family history of diabetes mellitus (.00).

Conclusion: A quarter of the sample population was having GDM and the major risk factors associated with GDM were age of the patient, body mass index of the patient, polycystic ovarian syndrome, previous history of GDM, previous history of macrosomic baby, family history of diabetes.

Key Words: Gestational diabetes mellitus, Risk factors, Insulin resistance, Impaired insulin secretion.

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INTRODUCTION

Global age-adjusted prevalence for GDM has been shown to increase over the time with decrease in physical activities, increase in BMI and other associated risk factors; however, variation in this prevalence is seen in different ethnic groups^{1,2}. Among the Asian and Filipina women the prevalence of GDM is 9.9 and 8.5%, respectively in normal weighted women. Whilst among Hispanic, non-Hispanic white and African American women the prevalence of GDM has been observed as >8.0% at higher BMI. The probability of prevention of gestational diabetes, considering all women to be normal weighted (BMI <25.0 kg/m²) ranges from 65 % for African American women to merely 23% among Asian women. One study indicated an increase of 29.3% in age-standardized incidence of GDM and of 7.3% in crude GDM over a decade³.

Only few studies have been published in Pakistan to see the incidence of gestational diabetes mellitus. Two recent studies, conducted in Bahawalpur and Lahore have shown the incidence of GDM in their respective settings. One study, conducted in Lahore, constituted 135 subjects among whom only one had GDM, which means the incidence of GDM was observed to be <1%⁴, whereas in other study, incidence of GDM among 124 studied women was 14.51% while GDM was seen in 6.45% among non-obese women and 22.58% in obese women⁵.

Hence a huge controversy is available in scarce data from Pakistan, which urges for further researches that could establish reliable and consistent epidemiological figures. This is imperative for avoiding adverse complications for both baby and mother. Thus we aim to conduct a study with rationale of establishing the prevalence of gestational diabetes mellitus and ascertaining

the risk factors associated with this problem.

METHODOLOGY

The cross sectional study was done at department of Gynecology Khyber Teaching Hospital Peshawar from august 2013-january 2014. All pregnant female coming for their routine checkup between 24 to 28 weeks were included in our study. Informed consent was obtained from each patient .Subjects with history of abnormal glucose tolerance and known diabetes mellitus were excluded were excluded.

After fulfilling the selection criteria a sample of 190 were taken by using expected prevalence of gestational diabetes = 14.51%, confidence level 95% and 5% absolute precision level using following WHO formula

$$n = z^2 \cdot 1-\alpha \cdot p^*(1-p) / d^2$$

Demographic profile (name, age, contact no.) was taken. History of related risk factors Physical Examination and investigation included obstetric ultrasound and blood samples were obtained from each subject to know about their clinical parameters like Fasting blood sugar level, random blood sugar level for Screening and diagnosis, HBA1C, Glucose tolerance test of patients was above the normal range .Criteria for diagnosis of gestational diabetes according to Carpenter and Coustan⁶.

- Fasting 95mg/dl
- 1 hour 180mg/dl
- 2 hours 155mg/dl
- 3 hour 140mg/dl Gestational diabetes was labeled as per operational definition. All data was

collected on predefined proforma.

A previous pregnancy which resulted in a child with a macrosomia (high birth weight: >90th centile or >4000 g (8 lbs 12.8 oz))⁷

Classical risk factors for developing gestational diabetes are:⁷

- Being overweight, greater than 25 increases the risk by a factor 2.1, 3.6 and 8.6, respectively⁸.

In polycystic ovarian syndrome three symptoms out of five are taken as diagnostic which includes obesity, hirsutism, irregular menstrual cycle, hormonal assessment, ultrasound finding for the polycystic ovaries⁷.

Data was analyzed by SPSS version 16. The data of gestational diabetes, risk factors, BMI classification was presented in form frequency (%). Association of gestational diabetes and risk factors were studied using chi-square test. Chi-square test was applied. P-value < 0.05 was taken as significant.

RESULTS

The mean age of patients was 33±22.8 years. Majority of patients were in the range greater than 35 years (n=82, 43.2%). Majority of patients were from Peshawar district (n=83, 43.8%) followed by Charsadda (n= 45, 23.7%) Mardan District (n=25, 13.1%), Hangu District (n= 15, 7.9%), Swat District (n=12, 6.3%), and Afghanistan (n=10, 5.2%).

Frequency of patients diagnosed as gestational diabetes mellitus on the basis of GTT was 50 (26.3%). The frequency of patients having no gestational diabetes mellitus was 140 (73.7%).

Table 1: Cross tabulation of GDM with all risk factors

		Gestational Diabetes Mellitus of Patient		Total	P Value
		Yes	No		
Age of Patient	<35	13	95	108	.000
	>35	37	45	82	
Body Mass Index of Patient	Normal	8	88	96	.000
	Over Weight	42	52	94	
Polycystic Ovarian Syndrome	Yes	29	34	63	.000
	No	21	106	127	
Previous History of Gestational Diabetes Mellitus	Yes	22	6	28	.000
	No	28	134	162	
Previous History of Macrosomic Baby	Yes	27	18	45	.000
	No	23	122	145	
Family History of Diabetes	Yes	34	29	63	.000
	No	16	111	127	

Cross tabulation of GDM with all Risk Factors is shown in Table 1.

DISCUSSION

In this study frequency of GDM is 50(26.3%) and of non GDM is 140 (73.3%) as compared to Bahawalpur study where prevalence of GDM among 124 studied women was 14.51% in 2010⁹. It is worth mentioning that a study for Louisiana reported 29% incidence of GDM in 2009³

According to Royal College of Gynecology and Obstetrics guidelines the age less than 25 years is less prone to develop GDM. The study done in Louisiana showed that more GDM cases were seen in women of age greater than 35 years³ and same were the results of study done in Baqai Medical University¹⁰. Our study also showed similarities with the above mentioned studies, age greater than 35 years were more prone to GDM.

The obesity was the risk factor for the development of GDM as in California study by Hedderson showed that overweight and obese women are more prone to develop GDM¹⁰. In Bahawalpur study also where large no of patients with GDM were obese¹¹.

A study done in Department of Gynecology and Obstetrics of North Carolina University showed half of PCOS diagnosed patients had GDM¹². An Indian study showed that history of polycystic ovarian syndrome is closely related to development of GDM¹³. In this study half of patients with GDM were having history of Polycystic Ovarian Syndrome.

A California study proved that patient having previous history of GDM is twofold more in a risk of future GDM¹⁴. The study which was done in Baqai Medical University showed majority of the patients having previous history of GDM¹⁰. In this study majority of the patients with GDM were having previous history of GDM. This risk factor was relevant with comparing study.

In Reece EA England study patient having history of macrosomic baby was more in a risk of development of GDM in next pregnancy¹⁵. Baqai University study also showed large no patients with GDM were having history of Macrosomic babies¹⁰. In this study large no patients with GDM having Previous history of Macrosomic babies which was relevant with comparing study.

The family history of type 2 Diabetes Mellitus was also an associated risk factor as in Conley study¹⁶. The study done in Baqai medical university large no patients with GDM were having family history of type 2 Diabetes Mellitus¹⁰. In this study more than half of the patients were having family history of Diabetes Mellitus.

CONCLUSION

A quarter of the sample population was having GDM 26.3%. The modifiable risk factors should be tackled

by broadening the awareness programs among pregnant women to do antenatal visit for in time diagnoses and treatment of GDM to avoid health complications between both mother and offspring. Further research should be done to control the frequency of GDM in women of Pakistan by reducing the obesity among Pakistani women by spreading awareness regarding diet intake and improve physical activity.

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CONTRIBUTORS

SB participated in planning of study, data analysis and manuscript writing. US helped in data management. NM supervised the study. All authors contributed significantly to the final manuscript.