

RISK FACTORS ASSOCIATED WITH GESTATIONAL DIABETES MELLITUS IN FEMALES PRESENTED AT A TERTIARY CARE HOSPITAL OF LAHORE

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ABSTRACT

Background and Objective: The gestational diabetes mellitus is one of the common complications associated with pregnancy, and is emerging as an important clinical problem. The objective of this study was to identify the risk factors associated with gestational diabetes.

Methods: It was an observational analytical study conducted at Lady Willingdon Hospital Lahore and completed in Gulab Devi Hospital, Lahore. The study was focused on pregnant women who attended the hospital for their routine check up after 24 weeks of their gestation. On the basis of available literature, a questionnaire was designed and used as a research tool. One hundred subjects of known gestational diabetes mellitus were selected as cases and hundred subjects without having gestational diabetes were selected as controls. Both groups were compared and results were analyzed using SPSS version 17.

Results: Risk factors that were found significantly associated with development of gestational diabetes mellitus included maternal age > 35 years ($p = 0.00$), body mass index ($p = 0.00$), parity ($p = 0.04$), family history of diabetes mellitus ($p = 0.00$), previous history of gestational diabetes mellitus ($p = 0.01$) and previous history of macrocosmic baby ($p = 0.00$). However both groups were similar with respect to maternal glucose intolerance and no significant association was found.

Conclusion: In this study higher maternal age (> 35 years), obesity, multiparity, family history of diabetes, previous history of gestational diabetes mellitus and previous history of macrocosmic baby delivery were identified as the significant risk factors associated with gestational diabetes mellitus.

Keywords: Gestational diabetes mellitus, Insulin resistance, Glucose intolerance, Birth weight, Public Health.

INTRODUCTION

Gestational diabetes mellitus (GDM) is defined as impaired glucose tolerance with onset or first recognition during pregnancy.¹ Gestational diabetes mellitus is the most common complication of pregnancy, affecting 1 – 14% of all the pregnancies and is an emerging health problem.² Different factors that have been found in pregnant women to develop diabetes in future are having diagnosis of GDM in early pregnancy, requiring insulin treatment during pregnancy, preterm delivery, raised blood glucose levels, delivery of macrosomic babies and irregular oral glucose tolerance test (OGTT) after two months of delivery.³ In literature, factors that have been determined as the risk of GDM among pregnant women are prior diagnosis of GDM, family history of type 2 diabetes, obesity, infections of the urinary tract, treatment of infertility, unidentified neonatal death, previous pregnancy that resulted in macrosomic babies, prematurity, pre-eclampsia and advanced maternal age.^{4,5}

There has been an increase in the prevalence of

gestational diabetes especially in South Asian countries. In order to address the issue of gestational diabetes, effective and affordable strategies should be made to prevent the GDM and this can be effectively done by identifying the related risk factors to GDM. Therefore this study aims to identify the associated risk factors of GDM in mothers presenting at tertiary care hospitals so as to improve overall maternal health.

SUBJECTS AND METHODS

Study Design and Setting

It was an observational analytical study conducted at Lady Willingdon Hospital, Lahore.

Subjects and Methods

The study recruited pregnant women who attended the Lady Willingdon Hospital, Lahore for their routine check up after 24 weeks of their gestation. On the basis of available literature, a questionnaire was designed and used as a research tool. Using non probability sampling, 100 subjects of known gestational diabetes

mellitus were selected as cases and 100 subjects without having gestational diabetes were selected as controls. After obtaining informed verbal consent patients were interviewed and their medical/clinical profile was reviewed. In addition to collecting their basic demographic details, information regarding the risk factors of GDM was collected on the predefined questionnaire.

Statistical Analysis

The results were analyzed using SPSS version 17.0. Chi-square was applied to find the association between GDM and related risk factors. p -value ≤ 0.05 was considered as significant.

RESULTS

The mean age of females with known gestational diabetes mellitus was 32 ± 20 years and for those that were not having gestational diabetes it was 29 ± 15.7 years. Risk factors that were found significantly associated with development of GDM included maternal age >35 years ($p=0.00$), body mass index BMI ($p=0.00$), parity ($p=0.04$), family history of diabetes mellitus ($p=0.00$), previous history of gestational diabetes mellitus ($p = 0.01$) and previous history of macrosomic baby ($p = 0.00$). However both groups were quite similar with respect to maternal glucose intolerance ($p = 0.25$) and no significant association was found. Cross tabulation of GDM with associated risk factors is shown in Table 1.

DISCUSSION

Gestational diabetes mellitus is a degree of glucose intolerance with onset or first recognition amid pregnancy.⁶ Similar to different individuals from the Asian race, Pakistani women are likewise thought to be at a high hazard for developing gestational diabetes.⁷ A number of maternal risk factors have been identified for development of GDM. Maternal age and BMI are identified as important risk factors in the prevalence of GDM particularly in South Asian women.⁸ Greater is the age of the pregnant women, greater the chances of development of GDM so age is a clear and distinct factor for developing GDM.⁹ In this study proportion of women having age > 35 years was higher in females having gestational diabetes as compared to females in control group. A significant association was found.

Similarly obesity is well known risk factors for the occurrence of GDM. The risk of occurrence of GDM is almost four times greater in obese in comparison with normal weight women having pregnancy.¹⁰ In this study, obesity was also found as a significant factor associated with GDM. Findings of the present study are

Table 1: Associated Risk factors of Gestational Diabetes Mellitus.

	Cases <i>n</i> = 100	Controls <i>n</i> = 100	<i>p</i> -value
<i>Maternal Age</i>			
> 35 years	72	70	0.00
≤ 35 years	28	30	
<i>Body Mass Index</i>			
Obese	80	63	0.00
Non-obese	20	37	
<i>Parity</i>			
Multiparous	53	40	0.04
Primiparous	47	60	
<i>Family history of diabetes mellitus</i>			
Yes	63	24	0.00
No	37	76	
<i>History of gestational diabetes</i>			
Yes	44	28	0.00
No	56	72	
<i>History of Macrosomic baby</i>			
Yes	72	57	0.01
No	28	53	
<i>Glucose Intolerance</i>			
Yes	59	54	0.25
No	41	46	

consistent with the findings of previously reported studies^{8,11,12} with respect to association of GDM with high maternal age and maternal obesity.

Multiparity is the recognized risk factor for causing glucose intolerance that ultimately leads to development of gestational diabetes.¹³ In this study, the proportion of multiparous women in females having gestational diabetes was higher as compared to females in control group and a significant association was found between GDM and multiparity as p -value (0.04) was significant. Findings of the current study are comparable with the findings of Pérez-Ferre et al¹⁴ and Moses et al¹⁵ who also demonstrated a significant association between GDM and multiparity.

In literature, family history of maternal diabetes is significantly more common among women with GDM than a paternal family history of diabetes mellitus.¹⁶ This significant association between GDM and family history of diabetes has been reported in various studies^{11,12,17-19} conducted in developing countries and in Pakistan^{20,21} as well.

Particular upshots in past pregnancies are considered as danger elements for GDM in successive pregnancies, for example, giving birth to baby with macrosomia and having previous history of GDM.²² However, history of macrosomia has been considered and

argued as a risk factor for GDM recently as macrosomia might have other causes such as some genetic factors, multiparity, obesity and excessive weight gain during pregnancy.²³ A large percentage (79%) of the children with macrosomia is born to mothers who are not suffering from any glucose intolerance.²⁴ Women diagnosed with GDM in previous pregnancy are at greater risk of developing GDM in subsequent pregnancies. The current study findings are comparable with the findings of these studies described as previous history of GDM and history of macrosomia baby are found significantly more common in females having GDM.

The study **concluded** that older maternal age (> 35 years), obesity, multiparity, family history of diabetes, previous history of gestational diabetes and previous history of macrosomic baby delivery were identified as the risk factors associated with gestational diabetes.

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CONTRIBUTION OF AUTHORS

All authors contributed equally in designing and preparation of the manuscript.

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