Original Article

Prevalence of Gestational Diabetes and Associated Maternal Factor

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ABSTRACT

The prevalence of gestational diabetes is rising all over the world. Maternal and neonatal complications are associated with gestational diabetes Mellitus. **Objective:** To investigate the prevalence of gestational diabetes and associated maternal factors in outpatients of Jinnah Hospital Lahore. **Methods:** The descriptive cross-sectional study design was used to assess the prevalence of gestational diabetes and associated maternal factors with a 200-population size that is deliberated from Slovin's formula for the pregnant women of the Gynae outpatient's department at Jinnah Hospital Lahore. The convenient sampling technique is used to collect the data from pregnant women. The study took approximately 9 months. The questionnaire asked about sociodemographic factors, family history, and medical history. **Results:** The prevalence of gestational diabetes mellitus was 36.8% in Pakistan. Positive family history (41.4%), increased BMI (46.6%), parity (83.5%), and obesity (59.2%) were determinants of gestational diabetes mellitus. Maternal complications like pre-eclampsia (8.3%), pregnancy-induced hypertension (20.1%), cesarean (48.9%), and antepartum hemorrhage (20.2%) were higher in GDM women. **Conclusions:** The study finding reveals that gestational diabetes mellitus was discovered to be highly prevalent in Pakistani women and they were at higher risk of developing maternal complications. Women with advanced maternal age, low monthly income, obesity, a family history of diabetes, parity number, and increased BMI are risk factors for Gestational diabetes mellitus.

INTRODUCTION

Gestational diabetes mellitus is known as glucose intolerance which usually does not exist before pregnancy [1]. Almost 15% of women around the world suffer from Gestational Diabetes during their pregnancy. Now, people started to notice the major medical complication of Pregnancy regarding Gestational Diabetes Mellitus (GDM) [2]. Gestational Diabetes mellitus is a public health issue that affects a large population of females in Public health concern [3]. It also has short-term and long-term consequences for both mother and the fetus. According to statistics, GDM affects 1% to 14% of all births and is on the rise [4]. Gestational Diabetes mellitus is a significant source of maternal morbidity and mortality [5]. It is very important to identify these mothers and have regular postpartum check-ups to treat and identify any issues regarding GDM [6]. Although the hazards associated with GDM are becoming more widely acknowledged, the impression of maternal health consequences is less clear [7]. Patients with a positive past family history of diabetes mellitus, obesity, urinary tract infection (UTI), death of neonates unexplained, premature birth, in past pregnancies, and advanced age maternity have also been proposed to impact the risk of Gestational Diabetes mellitus among mothers [8]. Women with Gestational Diabetes are more prone to develop any kind of morbidity and are less tolerant to Glucose and it identifies women who develop diabetes mellitus (type 2) post their pregnancy years [9]. The associated risk resulting in the births of

healthy babies can be avoided and lowered by managing gestational diabetes Mellitus [10]. As a result, proper GDM management will enhance Mellitus and associated consequences in Asian populations [11]. In Pakistan, it is still unclear how common glucose intolerance is during pregnancy. Small trials conducted in hospitals reported that Gestational diabetes mellitus is about 3.2% and 1.9% for impaired glucose tolerance [12]. This study was conducted to determine the prevalence of gestational diabetes mellitus and related maternal complications [13]. Pregnant women who have lifestyle factors for hyperglycemia include age over 25, being overweight (BMI > 27 kg/m2 before pregnancy and BMI > 30 kg/m2 during pregnancy), having a family history of diabetes, having previously experienced pregnancy-induced hypertension, and giving birth to a baby who was under 4.5 kg in weight [14]. It is highly suggested that pregnant women with any risk factor related to gestational diabetes mellitus should undergo OGTT and HbA1c tests at the beginning of their pregnancy and during the 2nd trimester to prevent complications and manage GDM effectively [15]. This is because the current standard of care in Pakistan for diagnosing and treating GDM is not very favorable [16]. According to previous studies reports, the prevalence of GDM ranges from 4.2% to 26% in Pakistan [17]. American diabetes association suggested that pregnant women without previous history of diabetes should go through a 75g Oral Glucose Tolerance Test (OGTT) at 23-28 weeks of gestation to improve gestational life and prevent adverse pregnancy outcomes [18]. Pregnant women with diabetes may have a long gestational age for childbirth weight, stillbirths, problematic delivery, neonatal morbidities, jaundice, respiratory abnormalities, and in-case deaths. Uncontrolled diabetes leads to weakened surgical site healing after caesareans [19].

METHODS

A descriptive Cross-sectional research study design was used. The study took approximately 9 months. The study setting was Jinnah Hospital Lahore's Gynae OPD patient department. This study targeted population was pregnant women visiting Jinnah Gynae OPD Lahore, Pakistan. A Convenient sampling technique used. The sample size was calculated through Slovin's formula of sampling which is indicated here. The sample size for this study was 133. All pregnant women were included in the study. Women with gestational diabetes was included in the study. Pregnant women with primary gravida was excluded from the study. Pregnant women with other co-morbidities were excluded from the study.

RESULTS

Table shows that from the total no of participants who responded to the study. Those with Pakistani nationality were 128(96.2%), those with non- Pakistani 5(3.8%). Those in the age group < 25 years were 58(43.6%), those in the age group 25-45 years were 51(38.3%), and those having the age group 35-45 years were only 24(18.0 %). Those who were illiterate 18 (13.5%), those who had primary education 29(21.8%), those with an educational level intermediate 35(26.3), those with an education level is secondary were 27(20.5%), education level women who were going to universities are 24(18.0%). women who were housewives 107(80.5%), those women with sedentary/professional 7(5.3%), those women with manual occupations 8 (6.0%), those with business women 10(7.5).and those women with police/army occupation were 1(0.8%). The prevalence of women living in villa 1(0.8%), those who were living in traditional houses was 100(75.2%), and those women who were living in apartment 32(24.1%). Those with a monthly income <15000 were 6(4.5%), those with a monthly income of 15000-25000 were 39(29.3%), those with a monthly income of 25000-35000 were 39(29.3%), those with a monthly income 35000-45000 were 24(18.0%), those with monthly income >45000 were 25(18.8%), most women were more likely to be of lower economic level.

Table 1: Sociodemographic risk factors for gestational diabetes mellitus in Pakistan

Demographic	ƒ (%)
Nationality	
Pakistani	128(96.2%)
non- Pakistani	5(3.8%)
Total	133(100%)
Age group (years)	
<25	58(43.6%)
25-34	51(38.3%)
35-45	24(18.0 %)
Total	133(100%)
Education level	
Illiterate	18 (13.5%),
Primary	29(21.8%)
Intermediates	35(26.3%)
Secondary	27(20.5%),
University	24(18.0%).
Total	133(100%)
Occupation	
Housewife	107(80.5%),
Sedentary/professional	7(5.3%)
Manual	8 (6.0%)
Business	10(7.5).
Police/army	1(0.8%).
Total	133(100%)
Housing condition	
Villa	1(0.8%),
Traditional house	100(75.2%),
Apartment	32(24.1%).

Total	133(100%)
Monthly income (PKR)	
<15000	6(4.5%),
15000–25000	39(29.3%)
25,000–35,000	39(29.3%),
35,000–45,000	24(18.0%),
>45,000	25(18.8%)
Total	133(100%)

Table 2 shows the form of participants who responded to this study. This table and graph reveal the determinant of gestational diabetes, consanguinity was higher in the women who responded yes were.4%) than the women who responded no were 50(37.6%). A total of 55(41.4%) women had a positive family history of diabetes and 78(58.6%) women don't have a family history of diabetes. Those with appropriate antenatal care were 97(72.9%) and those who were not taking appropriate antenatal care were 36(27.1%).

Table 2: Determinants of gestational diabetes mellitus (GDM) according to family history

Variables	Response ƒ (%)
Family history of diabetes	
Yes	55(41.4%)
No	78(58.6%)
Total	133(100%)
Consanguinity	
Yes	83(62.4%),
No	50(37.6%).
Total	133(100%)
Appropriate antenatal care	
Yes	97(72.9%)
No	36(27.1%)
Total	133(100%)

Table 3 show the total no of participants who responded to this study. Those women with parity <2 were 111(83.5%), those with parity 2-3 were 21(15.8), and those with parity >4 were 1(0.8%). Those with BMI <25 were 62(46.6%), those with BMI 25-30 were 41(30.8%), and those with BMI >30 were 30(22.6%). Those with a history of abortion were 48(36.1%), those with a history of stillbirth were 36(27.1%), and those with no history of obstetrics were 49(36.8%).

Table 3: Determinants of gestational diabetes mellitus (GDM) according to medical history

Variables	ƒ (%)
Parity number	
<2	111(83.5%),
2-3	21(15.8%)
>4	1(0.8%).
Total	133(100%)
Body Mass Index	
<25	62(46.6%)
25-30	41(30.8%),
>30	30(22.6%)

Total	133(100%)
Obstetric risks in the past	
Abortion	48(36.1%),
Stillbirth	36(27.1%),
No	49(36.8%)
Total	133(100%)

Maternal complications like pre-eclampsia (8.3%), pregnancy-induced hypertension (20.1%), cesarean (48.9%), and antepartum hemorrhage (20.2%) were higher in GDM women (Table 4).

Table 4: Comparison of maternal complications between women with gestational diabetes mellitus (GDM)

Variables	Response ƒ (%)
Pre-eclampsia	
Yes	11(8.3%)
No	122(91.7%)
Total	133(100%)
Pregnancy-induced hypertension	
Yes	27(20.2%)
No	106(79.7%)
Total	133(100%)
Antepartum hemorrhage	
Yes	26(20.1%)
No	106(79.7%)
Total	133(100%)
Cesarean	
Yes	65(48.9%)
No	68(51.1%)
Total	133(100)

DISCUSSION

The descriptive Cross-sectional study was examining the prevalence rate of gestational diabetes and related maternal factors. Gestational diabetes mellitus is the most known medical problem associated with neonatal and maternal complications during pregnancy. This study offers details on the risk of GDM that can be useful for early intervention strategies. Women with GDM in our study were more likely to face worse health outcomes and experience difficulties during pregnancy. Maternal age, family history of diabetes, socioeconomic position, increasing maternal BMI, and parity were the risk factors seen most frequently in the study of women with GDM. According to this survey, socioeconomic status affects the likelihood of developing diabetes during pregnancy. A Study conducted by Larebo *et al.*, shows that primary education, no history of abortion, a history of late gestational age in weeks, no previous history of coffee drinking, and adequate dietary diversity were all found to be significantly associated with, though we found no association between the number of pregnancies and GDM in study [20]. In this study prevalence rate of women with age group 25y were 43.6%, 25y to 34y were 38% and 35y to 45y were 18%. Even though there was

no statistically significant difference in the socioeconomic status of the two groups, women with GDM were frequently housewives (80.3%) and of low socioeconomic rank (29.3%). This suggests that women with GDM may not have understood the importance of diabetes. It is imperative to make serious efforts to increase the educational awareness of GDM women to enhance their outcomes. Family and medical history, 44.4% of pregnant women with gestational diabetes mellitus had a family history of diabetes, according to the data. Women with GDM have a higher rate of consanguinity (62.4%), as do women who are parous 2 (83.5%). In GDM women, abortion (36.1%) and stillbirth (27.1%) were significant past obstetric risks. Women expected pregnancy should be aware of all the risk factors related to maternal obesity and how it can complicate their pregnancies. In epidemiologic studies, a positive family history of diabetes and increased parity have consistently been identified as the main risk factors for the progress of gestational diabetes. A study conducted by Muche *et al.,* shows that prevalence of GDM was higher in central Africa 20.4% and the risk factors that are associated with GDM were Overweight and obesity, macrosomia, family history of diabetes, history of stillbirth, history of abortion, chronic hypertension and history of previous GDM [6]. This study provides information on the risk factors of GDM that can be useful for early intervention strategies. Women with GDM in our study were more likely to experience worse health outcomes and to experience maternal complications. Maternal age, family history of diabetes, low socioeconomic position, increasing maternal BMI, and parity were the risk factors seen most frequently in this study. Maternal complications such as pregnancy-induced hypertension, pre-eclampsia, antepartum hemorrhage, and cesarean delivery were possible outcomes of such pregnancy-induced hypertension, pre-eclampsia, antepartum hemorrhage, and cesarean delivery were possible outcomes linked to GDM. A study conducted in Iran by Keshavarz *et al.,* also indicated that GDM increases the risk of pregnancy complications [21]. In the study sample, globally the risk factor of advanced maternal age was the rise in women with gestational diabetes mellitus. Women with GDM were at high risk of developing pre-eclampsia 8.3%, pregnancy-induced hypertension (20.2%), antepartum hemorrhage (19.5%), and cesarean (48.9%). This study results are consistence with the previous study conducted by Bener, that pregnancy-induced hypertension (19.1%), pre-eclampsia (7.3%), antepartum hemorrhage (19.2%), preterm labor (19.8%), premature rupture of membrane (15.3%), and have a cesarean section (27.9%) were higher in gestational diabetes mellitus women [8, 22]. Also, another study

indicated similar maternal complications among GDM women in Iran [23]. The results of the previous study clearly show the presence of maternal diabetes mellitus during pregnancy has important consequence for both mother and child. Logistic regression reveals that advance maternal age, obesity family history of diabetes, antepartum hemorrhage, cesarean was significantly associated with GDM. The study results show, GDM is seen more frequent in obese women can be an important confounder for the association with birth weight. This study showed that obstetricians can lower the risk of these outcomes with routine care, which includes customized food and lifestyle recommendations throughout pregnancy.

C O N C L U S I O N S

Gestational diabetes mellitus was discovered to be prevalent in Pakistan. Women with consanguinity and obesity, a positive family history of diabetes, a history of abortion/miscarriage, a history of stillbirth, parity number, and increased body mass index are risk factors for Gestational diabetes mellitus.

Authors Contribution

Conceptualization: ES, HS
Methodology: ES, HS
Formal Analysis: SB
Writing-review and editing: ES, HS, SB

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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