ORIGINAL ARTICLE

Frequency of Factors Leading to Gestational Diabetes

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ABSTRACT

Aim: To determine the frequency of factors leading to gestational diabetes in patients visiting Central Park Teaching Hospital, Lahore.
Study design: Cross sectional study
Place and duration of study: Obstetrics and Gynae Unit, Central Park Teaching Hospital, Lahore 1st April 2014-30th Sep 2015.
Methodology: All women of reproductive age who had greater than 28 weeks of gestation with gestational diabetes diagnosed by glucose tolerance test according to WHO criteria fasting plasma glucose >7mmol/L, 2hr glucose >7.8mmol/L. Ninety pregnant women fulfilling the inclusion criteria admitted in Gynecology ward through emergency and outdoor were taken. After taking informed consent their demographic profile age, parity was taken. Factors like age, family history of Diabetes Mellitus were noted and BMI were calculated. The data was analyzed through SPSS version 10. Variables like family history of Diabetes Mellitus, maternal age >30 years (yes, no), obesity (yes, no) were presented in the form of frequency and percentage.
Results: In this study, a total of 90 patients were recruited after fulfilling the inclusion/exclusion criteria to determine the frequency of factors leading to gestational diabetes in patients visiting Central Park Teaching Hospital, Lahore. Age distribution of the patients shows majority of the patients between 31-35 years i.e., 37(41.11%), 22(24.44%) were found to be>35 years of age, and 18(20%) were between 26-30 years and 13(14.45%) between 20-25years. Mean and s.d was recorded as 34.21+/- 6.24. Gestational age shows 32(35.55%) between 38-42 weeks, 23(25.56%) between 34-38, 21(23.33%) between 30-34and 14(15.56%) between 26-30 weeks of gestation. Distribution of frequency of risk factors show 4(4.44%) with no risk factor, 38(42.22%) with one risk factor, 27(30%) with two risk factors and 21(23.34%) with all three risk factors.
Conclusion: We concluded that advanced maternal age, obesity and family history of diabetes are the leading risk factors of gestational diabetes mellitus and the general population may seek an early antenatal care in the presence of these factors for the avoidance of maternal and fetal outcome.
Keywords: Gestational Diabetes Mellitus, risk factors, advanced maternal age

INTRODUCTION

Gestational diabetes or (gestational diabetes mellitus GDM) is defined as abnormal glucose tolerance which first develops or is recognized in pregnancy, this definition includes individuals with previously undiagnosed diabetes as well as those in whom high glucose levels are provoked by pregnancy. The prevalence of GDM is 10%[1]. Gestational diabetes generally has few symptoms and it is most commonly diagnosed by screening during pregnancy. Diagnostic test detect inappropriately high levels of glucose in blood samples[2]. According to WHO criteria GDM is defined as one or more values following a 75gm glucose load; fasting plasma glucose >7mmol/L, 2 hr glucose >7.8mmol/L[1]. The hallmark of GDM is increased insulin resistance. Pregnancy hormones and other factors are thought to interfere with the action of insulin as it binds to the insulin receptor. The interference probably occurs at the level of the cell signaling pathway behind the insulin receptor[3]. Classical risk factors for developing gestational diabetes are the following[3].

- A previous diagnosis of gestational diabetes or pre-diabetes, impaired glucose tolerance, or impaired fasting glycaemia
- A family history revealing a first degree relative with type 2 diabetes.
- Maternal age a woman's risk factor increases as she gets older (especially for women over 35 years of age).
- Being overweight, obese or severely obese.
- Previous pregnancy which resulted in a child with a high birth weight (>90th centile, or 4000gm (8lbs 12.8 oz).
- Previous poor obstetrics history

Diabetes mellitus is associated with macrosomia[4] and shoulder dystocia and high risk of emergency

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cesarean section, macrosomic infants have more chances of admission to NICU[5], respiratory distress, hypoglycemia and neonatal jaundice[6].

According to previous studies, frequency of associated (or risk) factors in patients of GDM are maternal age 30 or more year is 71.6%, family history of diabetes mellitus is 50% and obesity is 29%[7]. Maternal and fetal morbidity from gestational diabetes mellitus are considerable and are high demands on health resources. The rationale of my study is to identify the risk factors and tell the general population that pregnancy with these factors is a high risk pregnancy and to seek early antenatal care in the presence of these factors can improve maternal and fetal outcome.

PATIENTS AND METHODS

All women of reproductive age, who had greater than 28 weeks of gestation (dating scan) with gestational diabetes diagnosed by glucose tolerance test according to WHO criteria fasting plasma glucose >7mmol/L, 2hr glucose >11.0mmol/L (as per operational definition). Ninety pregnant women fulfilling the inclusion criteria admitted in Gynecology ward through emergency and outdoor were taken. After taking informed consent their demographic profile age, parity was taken. Factors like age, family history of Diabetes Mellitus were noted and BMI were calculated. All this information was collected through especially designed proforma. The data was analyzed through SPSS version 10. Variables like family history of Diabetes Mellitus, maternal age >30 years (yes, no), obesity (yes, no) were presented in the form of frequency and percentage. Quantitative variable like age was presented as mean +/- standard deviation.

RESULTS

In this study, a total of 90 patients were recruited after fulfilling the inclusion/exclusion criteria to determine the frequency of factors leading to gestational diabetes in patients visiting Central Park Teaching Hospital, Lahore. Age distribution of the patients shows majority of the patients between 31-35 years i.e. 37(41.11%), 22(24.44%) were found to be>35 years of age and 20% (n=18) were between 26-30 years and 13(14.45%) between 20-25years. Mean and s.d was recorded as 34.21 +/- 6.24. Gestational age shows 32(35.55%) between 38-42 weeks, 23(25.56%) between 34-38, 21(23.33%) between 30-34 and 14(15.56%) between 26-30 weeks of gestation. Distribution frequency of risk factors how 4(4.44%) with no risk factor, 38(42.22%) with one risk factor, 27(30%) with two risk factors and 21(23.34%) with all three risk factors. Frequency of factors leading to gestational diabetes show 59(65.56%) with advanced maternal age, 36(40%) with obesity and 41(40%) with family history of diabetes mellitus.

Table 1: Age distribution (n=90)

Age (in years)	n	%age
20-25	13	14.45
26-30	18	20
31-35	37	41.11
>35	22	24.44
Mean and S.D = 34.21±6.24		

Table 2: Gestational age (n=90)

Gestational age (week)	n	%age
26-30	14	15.56
30-34	21	23.33
34-38	23	25.56
38-42	32	35.55

Table 3: Distribution of frequency of risk factors (n=90)

Frequency of Risk factors	n	%age
No risk factor	4	4.44
One risk factor	38	42.22
Two risk factors	27	30
Three risk factors	21	23.34

Table 4: Frequency of factors leading to gestational diabetes (n=90)

Factors	n	%age
Advanced maternal age	59	65.56
Obesity	36	40
Family history of diabetes	41	35.56

DISCUSSION

Almost 10% of pregnancies are complicated by gestational diabetes mellitus (GDM) with the incidence rising steadily This is important because GDM is a risk factor for pregnancy- related maternal and perinatal morbidity and predisposes women and their offspring to the development of type 2 diabetes[7]. The clinical recognition and appropriate management of GDM will improve both maternal and perinatal outcomes. However the relevance of traditional risk factors and screening recommendations for GDM in ageing, increasingly overweight and ethnically diverse obstetric populations remains uncertain.

Many risk factors for GDM have been identified. The most widely recognized of these include advanced maternal age, increasing maternal body mass index (BMI), ethnicity, family history of type 2 diabetes and a previous history of GDM. Additional risk factors are a history of a macrosomic baby in a previous pregnancy or adverse pregnancy outcome, a woman's own low birth weight, polyhydramnios or a large for gestational age fetus in the current

pregnancy. The rationale of the current study was to tell the general population that pregnancy with these factors is a high risk pregnancy and to seek early antenatal care in the presence of these factors and as obesity is increasing so decrease weight pre conceptionally.

Maternal age is an established risk factor for gestational diabetes mellitus (GDM), but there is no consensus on the age above which there is significantly increased risk of GDM. In the literature, the lowest cutoff is ≥ 25 years, as recommended by the American Diabetes Association.

In our study, majority of the patients were between 31-35 years i.e., 37(41.11%) and 22(24.44%) were found with >35 years of age mean and s.d was 34.21±6.24, so 56(65.56%) were with advanced maternal age. Our results are in agreement with a study who recorded 71.6% of advanced maternal age as a risk factor of gestational diabetes mellitus. Terence et al in their study with the view to determine maternal age and prevalence of gestational diabetes mellitus recorded that there was a significant difference and positive correlation in the prevalence of GDM, increasing from 1.3, 2.5, 6.2, 10.3, 21.7, and 31.9% respectively, from the youngest to the oldest cohort (P<0.001) and indicated that the risk of GDM becomes significantly and progressively increased from 25 years onwards. This supports the American Diabetes Association recommendation on the use of age ≥25 years as the cutoff for screening and the observation that maternal age ≥ 25 years is the factor most predictive of GDM , while in our study we considered > 30 years of age advanced maternal age.

Yang H et al determined the incidence of gestational diabetes mellitus (GDM) in china and further identified population specific risk factors for GDM and showed that including advanced maternal age, pre-pregnancy obesity and family history of diabetes, were strongly associated with an elevated GDM risk.

Cypryk K and co workers conducted a study to evaluate risk factors for GDM and their predictive value which shows that the GDM patients were significantly older than the NGT subjects (30.1 vs. 27.2 years; P<0.0001), had a greater tendency towards obesity before pregnancy (BMI 25.0 vs. 21.6kg/m2; P <0.0001), had greater parity (third or subsequent pregnancy: 33.6 vs. 16%; p<0.001) and more often experienced adverse perinatal outcomes (21.4 vs.13.7%; P<0.01) . Multivariate analysis revealed the following risk factors for GDM: BMI > 25kg/m2 (OR 4.14), a history of macrosomia (OR 2.72), being pregnant for the third time or more (OR 1.8), a family history of diabetes (OR 1.76) and age at gestation > 25 years (OR 1.34). No risk factors were present in 12% of GDM subjects only, and at least one risk factor was found in 74.1% of subjects with NGT.

The findings of the study are inconsistent with the result of the current study. In another study in a polish population risk factors were present in 44.4% to 68.4% of the groups. Other studies show that one or more GDM risk factors may be found in from 20 to 90% of pregnant women, while in the current study, 42.22% of the patients were found with at least one risk factor of gestational diabetes mellitus and only 4.44% of the patients had no risk factor of gestational diabetes mellitus, which is in agreement with the above studies. However, age, obesity, diabetes in the family has been identified as risk factors for GDM. Nevertheless, a substantial number of women with GDM present with none of these risk factors.

CONCLUSION

We concluded that advanced maternal age, obesity and family history of diabetes are the leading risk factors of gestational diabetes mellitus and the general population may seek an early antenatal care in the presence of these factors for the avoidance of maternal and fetal outcome.

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