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PREVALENCE OF GESTATIONAL DIABETES MELLITUS AND ITS ASSOCIATION WITH RISK FACTORS

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ABSTRACT:

Back ground: Gestational Diabetes Mellitus (GDM) is a state of carbohydrates intolerance during pregnancy and effects with complications to 3-7% of pregnancies.
Objective: To determine frequency of GDM in pregnancies and to assess its association with age, parity and other risk factors.
Methodology: This study was conducted on pregnant women coming to a public sector hospital for antenatal care with gestational age 24 weeks or more, during October 2008 to April 2010. All the study subjects were tested for one hour Glucose Test(GCT) and positive cases were subjected for (OGTT).
Results: Out of 585 pregnant women, GCT was positive in 235 cases (40.1%). Of these 38 (6.5%) were detected as GDM positive cases. The major risk factors were family history of diabetes(18.4%), parity (13.2%) and increased BMI(13.2%). All were strongly associated with GDM.
Conclusion: The frequency of GDM screened by GCT at Civil Hospital was 6.5% and was more prevalent in families who were over weight, multipara and having family history of diabetes.

Keywords: GDM, frequency of GDM, Risk factors of GDM, GCT, OGTT

INTRODUCTION:

Gestational diabetes mellitus (GDM) is defined as any degree of glucose intolerance with its onset (or first diagnosis) during pregnancy and usually resolving shortly after delivery[1]. The glucose tolerance test (GDM) was first introduced by O, Sullivan et al. as a screening test for patients at high risk for gestational diabetes[2,3]. GDM is usually a symptomatic but has serious consequences that can be reduced by treatment[4]. Making it a candidate for screening, Currnet National institute for clinical excellence (NICE) guidance suggest that screening should be offered at the time of booking to women with the following risk factors for developing GDM[5]:

- BMI>30
- Previous macrocosmic baby>4,5 kg or above
- Previous GDM
- First degree relative with diabetes mellitus

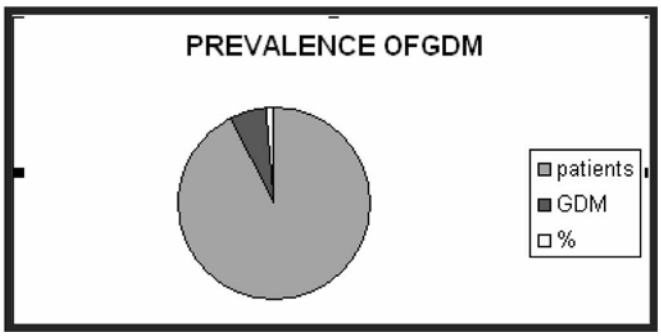
Screening for risk factors is controversial; however some authorities advocate universal screening for all pregnant women. GDM is rare before 20 weeks[6] and early diagnosis of GDM is associated with poor maternal and fetal outcome[7].
Therefore, given the uncertainty regarding the necessity of the universal Glucose challenge test (GCT) screening this study was design to determine the frequency of GDM in our culture and whether maternal age, elevated BMI and other risk factors predict

abnormal results.

MATERIAL AND METHODS:

This study was conducted on pregnant women reporting to a public sector hospital (Civil Hospital, Karachi) for antenatal care with gestational age of 24 weeks or more during the period of October 2008 to April 2010. Exclusion criteria were pregnant women with history of Diabetes Mellitus or presenting before 24 weeks of gestation. All the study subjects were tested for one hour GCT by using 50gms of sugar orally. For this purpose blood was taken after one hour and if the level of blood sugar comes positively abnormal i.e., 150mg/dl, than they have to go for OGTT with 100gms of sugar for 3 hours. On each hour, blood sample were taken and blood sugar level was determine to declare the case positive GDM or not with cut off value of 105,190,165 and 145 mg/dl at the fasting period and 1, 2, 3 hour, respectively. The finding was correlated with risk factors. The results were analyzed by using SPSS version 15.

GRAPH I
Pie chart shows percentage of patients with GDM based on OGTT



Total no of patients 585.
38 cases positive for GDM
Percentage 6.5%

TABLE I:

Characteristic of the study population	
Total no of pregnant women	585
Maternal age range (years)	32-38 (34.5 ± 1.1mean)
Parity range	00-06 (2.5mean)
Gestational age (weeks)	24-34 (26.8 mean)

RESULTS:

During the study period there were 585 pregnant women with gestational age of 24 weeks or more between the ages of 32 to 38 years were registered for the study after verbal consent. The mean age of patients was 34.5 ± 1.1. With respect to gestational age, the mean was 26.8 weeks (range 24-34 weeks). Regarding parity, 380 (64.9%) were multipara and 205 (35.1%) were primipara.(Table I)

Out of 235 positive cases of GCT, 38 cases had GDM based on positive OGTT. The percentage of GDM was 6.7% (graph I). Out of 585 patients, 170 patients had some risk factors (family history of GDM, history of GDM, BMI, and parity) whereas 415 have no risk factors. The ratio was 3:1 (having risk factor and not having risk) which is significant. Out of 170 patients who had some risk factors, 90 (52.9 %) were found GCT positive while out of 415 who had no risk factors, 145 (34.9%) patients were positive for GCT. (Table II)

Regarding the risk factors, the most common factor was family history of DM (18.4%) followed by females with increased BMI (13.5), history of GDM (15.7%), and multi Para (13.5%). (Table III)

TABLE-III

Percentage of GDM patient by type of risk factors

Risk factor	GDM (n=38)	(%)
None	15	39.47
Family History of GDM	07	18.42
History of GDM	06	15.78
BMI	05	13.5
Parity	05	13.5

DISCUSION:

GDM is a growing health concern in many parts of the world. It occurs in 2.5 % pregnancies but figures very considerably depending upon the criteria used. Only 10 % of these patients would be diabetic if it wasn't for the pregnancy effects on glucose (i:e 10 % was diabetic but coincidentally diagnosed when pregnant). In our study, it was 6.7 %.

Mean BMI at the time of GCT testing was significantly higher in patient with abnormal GCT as compared to patient with normal test results. (35.3 Vs. 29.8 kg/m^2 respectively; $p < 0.05$). Our data also indicate that the maternal BMI of > 30 and maternal age >32 years are the optimal predictors of an abnormal GCT. A large body of data shows that maternal obesity is a significant risk factor for the development of GDM. High BMI before pregnancy

Table II:

Percentage and ratio of GCT positive patients with risk factors (Family history of DM, History of GDM, BMI and Parity)

Risk Factors position	Number of patients	GCT +ve	Percentage
Risk Factors +ve	170	90	52.9
Risk Factors –ve	415	145	34.9
Total cases	585	235	40.1

is three- fold risk for obese women compared to non -obese women. Change in weight between pregnancies and inter- pregnancy gain of more then three units (of BMI) makes double the risks of GDM.[8] Family history of type 2 diabetes of GDM more relevant in multiparous then the parous women[9] Kabiru et al concluded that as maternal weight increases, the likelihood of GDM also increase.[10] Physical activity, especially vigorous activity before pregnancy and at least light- to– moderate activity during pregnancy may reduce risk for abnormal glucose tolerance.[11] Bariatric surgery; reduces the future risk of developing GDM in obese women.[12]

In our study GDM was present in (13.15) % of women aged > 32 years, in (18.42) % of women with family history of DM, in (13.15) % of women who were overweight prior to conception. Our study also found that when these females were screened with 50 Gms glucose load, they had a strong association with risk factors.

CONCLUSION

GDM is associated with increased morbidity in mothers and fetus. Early detection and intervention is important because it improves pregnancy outcome. Many researchers reveal that age of pregnant women and pre pregnancy BMI was highly significant to the risk of GMD. The American College of Obstetricians and Gynecologists recommended that pregnant women over the age of 30 be screened for GDM Further studies are required to identify high risk populations for GDM. Physical activity, especially vigorous activity before pregnancy and at least light- to– moderate activity during pregnancy may reduce risk for abnormal glucose tolerance. Bariatric surgery; reduces the future risk of developing GDM in obese women.

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