THE PREVALENCE OF GESTATIONAL DIABETES IN PATIENTS ATTENDING DIABETIC CLINIC AT SIR SYED HOSPITAL

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ABSTRACT
The present study was designed to find the prevalence of gestational Diabetes mellitus (GDM) in patients attending Diabetic Clinic of Sir Syed Hospital from June 2005 to December 2005 with gestational age between 24th to 28th weeks with or without risk factors. Fifty gm glucose challenge test was used for screening with cut off value of blood glucose > 130 mg/dl (7.2 mmol/L). Out of 405 women seventy-two women screened positive and 100 gm oral glucose tolerance test was offered and seventeen women were diagnosed as gestational diabetes mellitus. Eight women were classified as impaired glucose tolerance while the gestational diabetes mellitus is more prevalent in high risk groups. The whole method was applied on pregnant female, irrespective of the last meal taken. Age between 20-40 yrs, and avoiding severely ill, and known diabetes.

INTRODUCTION
Diabetes mellitus is a heterogeneous primary disorder of carbohydrate metabolism with multiple etiologic factors that generally involves absolute or relative insulin deficiency, insulin resistance or both. All causes of diabetes ultimately lead to hyperglycemia, which is the hallmark of this syndrome (Olefsky, 1992).

Gestational diabetes refers to diabetes that develops in the course of pregnancy and remits following delivery (Kumar and Clark, 2002). It is defined as the appearance of hyperglycemia in a pregnant woman previously not known to be diabetic. The majority of such individuals progress to overt type 2 diabetes mellitus with time. There are 30000 to 90000 cases of gestational diabetes per year in USA (Freinkle, 1980).

The hormonal and metabolic changes of pregnancy result in glucose intolerance during the 2nd half of the gestation in 2 to 3% of pregnant women (Kitzmiller 1980). In the first trimester of a non-diabetic pregnancy, insulin action is enhanced by estrogens and progesterone and glucose levels tend to decline (Roger and Danieal, 1985).

Maternal metabolic surveillance should be directed at detecting hyperglycemia severe enough to increase risks to the fetus. Daily self-monitoring of blood glucose appears to be superior to intermittent monitoring of plasma glucose. Urine glucose monitoring is not useful for GDM. Urine ketone monitoring may be useful in detecting insufficient caloric and carbohydrate intake in women treated with caloric restriction. Maternal surveillance should include, blood pressure and urine protein monitoring to detect hypertensive disorder. Assessment for asymmetric fetal growth by ultrasonography, particularly in early third trimester, may aid in identifying fetuses that can benefit from maternal insulin therapy. All women with GDM should receive nutritional counseling, consistent with the recommendations by the American Diabetes
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Individualization of medical nutrition therapy depending on maternal weight and height is recommended. For obese women (BMI >30kg/m²), a 30-33% calorie restriction has been shown to reduce hyperglycemia and plasma triglycerides with no increase in ketonuria. Insulin is the pharmacologic therapy that has most consistently been shown to reduce fetal morbidities when added to medical nutrition therapy. Oral glucose-lowering agents have generally not been recommended during pregnancy. Programs of moderate physical exercise have been shown to lower maternal glucose concentrations in women with GDM. GDM is not itself an indication for cesarean delivery or for delivery before 38 completed weeks of gestation. Prolongation of gestation past 38 weeks increases the risk of fetal macrosomia without reducing cesarean rates, so that delivery during the 38th week is recommended unless obstetric considerations dictate otherwise. Breast-feeding, as always, should be encouraged in women with GDM (American Diabetes Association, 2004).

GDM is among the most common complications of pregnancy. GDM complicates approximately 7% of all pregnancies resulting in more than 200000 cases annually. Recent data have shown a substantial rise in the incidence of GDM from 1991 to 2000 (Dabelea et al., 2005; Zhang et al., 2006). Children of women with GDM are more likely to be obese and have impaired glucose tolerance and diabetes in early adulthood (American Diabetes Association, 2004; Zhang et al., 2006). Our study is aimed at studying prevalence of GDM in our part of the world.

MATERIAL AND METHODS

This was a prospective hospital based study conducted on 405 pregnant females through the Diabetic Clinic, Sir Syed Hospital, Qayyumabad, Karachi from June 2005 to December 2005.

All pregnant females between the age of 20 to 40 years and in their 24th to 28th week of pregnancy, were selected for the study. Critically ill patients, pregnant females below 20 years and above 40 years of age and those who were known diabetics were excluded from the study. After taking relevant history, blood pressure was taken in sitting position and a detailed performa was filled. Any previous or recent investigation was also taken into consideration. The investigations of interest were urine report, plasma sugar level, fasting or random blood sugar levels and ultrasound report.

The ladies were advised to take normal diet with no restriction for at least 3 days prior to the oral glucose tolerance test. They were asked to come in the morning with an overnight fast of 10-12 hours. This especially means a normal carbohydrate intake. All these pregnant ladies were offered 50gm of glaxose D dissolved in 100 ml of plain water irrespective of previous breakfast taken or the quality of the meal. After one hour, blood sample was collected observing full aseptic measures from the ante-cubital vein of the forearm and sent to the laboratory for investigation.

Those samples which crosses the threshold of 130mg/dl (7.2mmol/l) were offered 100gm dissolved in 200 ml of plain water was given to drink.

Fasting blood samples were drawn 100 gm of glucose as GLAXOSE D dissolved in 200 ml of plain water were given to drink. Sample of venous blood were drawn at one, two and three hours later.

RESULTS

In this study out of four hundred and five pregnant females who were investigated for the prevalence of GDM, seventy two (17.7% CI 14.2-21.7) pregnant females had abnormal one hour 50-gm oral glucose tolerance test (>7.2 mmol/L). Out of seventy two, twenty five pregnant female (6.17% CI 4.1-8.8) had abnormal plasma glucose level on 100 gm-OGTT. In forty seven pregnant females (11.6
OGTT results were normal. The twenty five ladies were further classified into two groups. Seventeen of them (4.19%, CI 2.5 to 6.5) were GDM as they have two or more abnormal values in 100gm OGTT. The rest of the eight pregnant ladies (1.97% CI 0.92-3.71) have values that were in the range of IGT (Fasting blood sugar ≥11 Omg/dl <126mg/dl) as shown in Table-1. Out of four hundred and five pregnant females one hundred and ten pregnant females were with high risk, and fifteen (13.6% CI 8.1-21.02) had GDM. While the rest of the two hundred and ninety five ladies with low risk factors had only two ladies (0.6% CI 0.11-2.22) having GDM as shown in Table-3.

In the same way IGT in low risk population (two hundred and ninety five) was only one (0.33%) while in highly-risk population (110 females) was seven (6.36% CI 2.8-12.18) (Table-4).

Analyzing the high risk patients having GDM it was found that 3 patients (17.64%) had a history of large babies. Five (29.4%) had a family history of DM, previous history of high blood sugar and glucosuria while only one (5.86%) had either a history of large babies with CS or PIH, two (11.76%) pregnant females had a bad obstetric history. In all, three (17.64%) pregnant females admitted that one of their sibling or parents are suffering with DM. The remaining two (11.76%) had a
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The prevalence of gestational diabetes in patients with a history of congenital anomaly as shown in Table-2.

STATISTICAL ANALYSIS

Prevalence of various investigations was expressed in their properties. The occurrence of low and high-risk patients were mentioned with 95% confidence interval.

DISCUSSION

According to our study the prevalence of GDM is 4.2% and 2% had impaired glucose tolerance as shown in Table-1 on the basis of 50 gram GTT for screening women attending the diabetic clinic. The prevalence of GDM is highly population specific but in general 3% to 5% pregnant women receive this diagnosis (Clinical Practice Recommendation-2000). The prevalence of GDM after screening 1000 women in antenatal clinic of Ayub Teaching Hospital, Abbottabad, were suffering from GDM it was found that 4.3% and 1.7% had an IGT, which is almost similar to our study. They also used 50 gram oral glucose challenge test for screening women coming in the antenatal clinic (Hassan, 2005). According to another study conducted in Ayub Medical College. Abbottabad, gestational diabetes complicates 2 to 5% of pregnancies, if metabolic control was good, perinatal mortality should be not higher than in general population (Ashfaq et al., 2005). The overall prevalence of GDM was 1% in Services Hospital, Lahore, while 1.6% was found to have IGT (Janaid et al., 2002). The disorders of glucose intolerance can be regarded as a disease of developing countries. Some of the local factors contributing to this high incidence are poverty and ignorance. People are not aware of nutritional and caloric values of food and implications on body weight and health. Carbohydrate based food is cheap and taken as staple diet, whereas fats are used to add to taste of the food. Moreover, lack of awareness regarding weight control puts them in a habit of excessive eating. The situation is further accentuated during pregnancy, wherein the women are customarily advised to take the food for ‘two’. This leads to obesity and unfortunately, this is taken as a sign of beauty and health in most of the rural population. These facts put our population at higher risk for diabetes and the importance of intensive screening for the detection of pre-clinical disease cannot be over estimated (Hassan, 2005; Lolemans et al., 2004; King and Rewers, 1991).

GDM is more prevalent in females who are overweight, multi-para and have a family history of diabetes mellitus (Jamshaid et al., 2002). Our study shows, women who were diagnosed as GDM, 17.6% had history of large babies, 29.4% had family history of diabetes or previous abnormal blood glucose levels, 11.7% had a bad obstetric history (Table-2).

There is a great variation in literature and international studies. The prevalence of GDM seems to be increasing in a universally screened multi-ethnic population. According to a study the prevalence of GDM doubled between 1994 and 2002 among women of varied ethnic/racial backgrounds. Very little of this increase was due to changes in the age and ethnic distribution of screened pregnancies or a previous history of diagnosed GDM. The observed increase in GDM prevalence is because of routine screening of all women without known diabetes and the same standard criteria was used to diagnose GDM (Dabelea et al., 2005). On the contrary, it was observed that the increase in cumulative incidence of GDM was not caused by the increasing proportion of screened pregnancies in race-ethnicity groups at higher risk in later years because similar increases in GDM cumulative incidence were observed in all age and race-ethnic groups (Ferrara et al., 2004).

GDM is the most common metabolic complication that affects pregnant females. Screening test in pregnancy for GDM should be convenient, cost effective and should have reasonable sensitivity and specificity with increasing awareness of this important clinical condition (Parveen and Saeed, 1996). WHO criteria is highly efficient in diagnosis of GDM (Shaheen et al., 2006).
Table 3
Gestational diabetes mellitus in high risk and low risk patients

<table>
<thead>
<tr>
<th>Low Risk (n=295)</th>
<th>G.D.M.</th>
<th>95% C.I.</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>02 (0.6%)</td>
<td>0.11-2.20</td>
</tr>
<tr>
<td>High Risk (n=110)</td>
<td>15 (13.6%)</td>
<td>8.1-21.02</td>
</tr>
</tbody>
</table>

Table 4
Impaired glucose tolerance in high risk and low risk patients

<table>
<thead>
<tr>
<th>Low Risk (n=295)</th>
<th>IGT Patients</th>
<th>95% C.I.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>01 (0.33%)</td>
<td>-</td>
</tr>
<tr>
<td>High Risk (n=110)</td>
<td>07 (6.36%)</td>
<td>2.8-12.18</td>
</tr>
</tbody>
</table>

It is recommended that 50gm glucose challenge test should be used as a screening test especially in those females who are overweight, having family history of diabetes mellitus, multiparity and previous obstetric complications as GDM is more common in these high risk females. This test is compared to oral glucose tolerance test is less time consuming, simple, less bothersome and cost-effective. By this test one can identify females who have high risk to develop non-insulin dependent diabetes mellitus (NIDDM) late in the life and early detection and initiation of treatment to restore euglycemia will prevent many of the major complications associated with hyperglycemia. Health education programs should be planned at the community level and in the antenatal clinics of the hospitals, especially for the pregnant females who are overweight, multipara and having family history of diabetes mellitus (Jamshaid et al., 2002).

CONCLUSION

GDM remains a high-risk state with increased morbidity and mortality in both mother and fetus. Earlier detection and intervention improves pregnancy outcome.

To screen women for gestational diabetes mellitus, 50 gm glucose challenge test may be used, as it has higher specificity.

Glucose challenge test has certain advantages over other screening tests like, glycosylated proteins or glycosylated hemoglobin and random blood glucose estimations. The first two are not only costly but are also insensitive, while the ‘random blood’ glucose estimation lacks sensitivity despite being cheap.

The lack of agreed screening tests for diagnosis of GDM and the questionable obstetric benefits of treating all women with mild disturbances of glucose tolerance in pregnancy, and lacking attitude towards follow-up in positively screened pregnant women may result in increased morbidity of mother and fetus.

Considering this, 50 gm glucose challenge test followed by 100 gm glucose tolerance test bears high diagnostic accuracy rate to confirm gestational diabetes.

REFERENCES


