GESTATIONAL DIABETES MELLITUS

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PROF-1914

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ABSTRACT... Introduction: Gestational diabetes mellitus is common disorder in pregnancy. It is associated with adverse pregnancy out come. There is no consensus regarding the optimal approach to screening of gestational diabetes mellitus. The present study has tried to observe the value of fasting blood glucose in screening of gestational diabetes. **Objective:** To determine the frequency of patients in whom fasting blood glucose and 100gm glucose tolerance show agreement for screening of gestational diabetes mellitus at 24 -28 wks. **Study design:** Comparative cross sectional study. **Settings:** The study was conducted at Gynecology and Obstetrics department Shaikh Zayed Federal Post Graduate Institute Lahore. **Duration of study with dates:** 6 months from 12Nov 2010 to 11 May 2011. **Material and method:** The study included 135 booked patients with positive family history of diabetes mellitus. All patients underwent fasting blood glucose at 24-28 weeks of gestation, regardless of results of fasting blood glucose on next visit they underwent 100g oral glucose tolerance test (OGTT). The agreement between fasting blood glucose and 100g oral glucose tolerance test was calculated in frequency and percentages. **Results:** The mean age of women in studied population was 27.15±3.70.Out of 135 patients 86.7 %(117) showed agreement between results of fasting blood glucose and 100g OGTT while 13.31 %(18) showed no agreement between both of the tests. **Conclusions:** Fasting blood glucose is a good screening option for gestational diabetes mellitus along with positive history. It provides a simple, cheap and more practical test for screening of gestational diabetes mellitus. However diagnostic confirmation with 100g OGTT should be done.

Key words: Nasal polyps , Helicobacter Pylori , PCR , GER.

INTRODUCTION

Gestational diabetes mellitus(GDM) is defined any degree of glucose intolerance with onset or first recognition during pregnancy regardless of whether diabetes persists after pregnancy[1,2]. It does not exclude the possibility that unrecognized glucose intolerance may have antedated or begun concomitantly with the pregnancy[3].

Diabetes mellitus is the most common medical complication of pregnancy. More than 90% of pregnant women with diabetes mellitus had gestational diabetes mellitus[4,5]. Gestational diabetes affects 3-10% of pregnancies depending on the population studied[6]. Some of the known complications of GDM include caesarian section, pre-eclampsia, still birth, macrosomia and neonatal hypoglycaemia[7]. It is also associated with adverse pregnancy outcome like miscarriages, congenital malformations, preterm labor, shoulder dystocia and operative delieveries[8,9].

With recent urbanization trends and changes in life styles, there is a rapid rise in gestational diabetes[10]. Undetected GDM is associated with 2 to 5 fold increase in perinatal morbidity and mortality such as macrosomia, hypoglycemia, congenital anomalies and still birth[11-13]. Recent studies indicate that this morbidity and mortality is preventable or at least reducible by early detection and appropriate management[14,15]. Major risk factor for developing GDM are family history of diabetes, obesity, prior history of GDM and large for gestational infants[16]. Women with positive risk factors have six times greater chance of developing GDM as compared to those with no risk factors[8,17]. Gestational diabetes predisposes to GDM in subsequent pregnancies and a 50% risk of developing type 2 diabetes in a 25years follow up[18]. Their offspring are prone to developing child hood obesity, with type 2 diabetes later in life[19]. Kim Sy et al calculated the percentage of gestational diabetes mellitus attributable to overweight and find overall population fraction was 46.2%[20].

Early diagnosis and appropriate treatment of GDM aimed at tight control over maternal glucose levels may positively influence the perinatal outcome.8 With the aim of diagnosing GDM two steps have been standardized; screening and diagnostic confirmation. The establishment of a diagnosis is, per se, an imperfect process[21]. The U.S. preventive services task force (USPSTF) considered the potential benefits and harms of screening and weighed the net benefit when evaluating the evidence for screening[22]. A potential harm of GDM screening is unnecessary glucose testing and treatment of women who would not ultimately develop problems related to GDM. Potential benefits include reduction in maternal pre-eclampsia, still birth, brachial plexus injuries, and clavicular fractures due to macrosomia[23].

A fasting serum glucose concentration greater than 90mg/dl (5mmol/l) at 24-28wks of gestation is highly sensitive to detect diabetes during pregnancy. The sensitivity and specificity of fasting serum glucose value ⩾ 90mg/dl for GDM is 66.6% and 81.25% respectively[24].

Women who screen positive should undergo an oral glucose tolerance test for definitive diagnosis. The 100gm glucose tolerance (100g GTT) is the most widely used method for diagnosing GDM. It measures maternal glucose levels while fasting, as well as one, two and three hours after taking glucose intake. The diagnosis is confirmed when two or more measurements equal or exceed the plasma glucose values established by Carpenter and coustan; ⩽ 95, 180, 155, and 140mg/dl under fasting conditions and one, two three hours after intake respectively[24]. Most widely used method for screening is 50gm glucose challenge test(50g GCT) however there is some evidence in literature, which has not shown 50g GCT as a better investigating modality and has recommended alternative screening modalities including the use of plasma glucose fasting as a screening test for the diagnosis of GDM[25,26].

A prospective study by Ayash et al shows agreement between fasting blood glucose and 100g GTT in 48.68% cases for the screening of GDM[27].

Comparison of fasting blood glucose with 100-g OGTT may enable determination of the validity of fasting blood glucose in screening of gestational diabetes mellitus. This study will help us to propose a simpler and more practical test for screening of gestational diabetes. Also to avoid discomfort of taking oral glucose and multiple sampling needed in 100gm OGTT.

RESULTS

A total number of 135 Booked Patients, who met the selection criteria, from outpatient department of Obstetric and Gynaecology department of Shaikh Zayed Federal Post Graduate Medical Institute Lahore were included in this study after taking verbal and written consent.

The mean age in this data set was 27.15±3.703. Age distribution of studied group is shown in Table I. However there is no difference of age between patients having GDM or not.

As per results of 100g OGTT 10.4% (14) patients were shown to have GDM while 89.6% (121) have no GDM. So prevalence of GDM in studied patients was 10.4%. (Table II).

Fasting blood glucose declared 16.3% (22) patients to have GDM and 83.7% (113) having no GDM. (Table III).

Out of 135 patients 117 (86.7%) patients showed agreement between results of 100g OGTT and fasting blood glucose, while 18 (13.31%) showed no agreement between results of these tests. (Table IV)

FBG was in diabetic range in 22 patients out of which 9 patients were diagnosed having GDM on OGTT also 13 were not. 113 patients were declared not having GDM on FBG out of which 108 showed same result on OGTT while 5 diagnosed to having GDM on OGTT. (Table V).

FBG and 100g OGTT showed moderate agreement [κ= 0.427(p<0.001), 95% confidence interval 0.211-0.643]. (Table VI) When data analyzed using Kappa statistics.170.

In addition to these results this study also showed that

Table-I. Age-wise distribution of studied sample

Age	Frequency	Percent	Cumulative percent
20	1	.7	.7
21	4	3.0	3.7
22	9	6.7	10.4
23	13	9.6	20.0
24	9	6.7	26.7
25	9	6.7	33.3
26	18	13.3	46.7
27	10	7.4	54.1
28	13	9.6	63.7
29	17	12.6	76.3
30	13	9.6	85.9
31	3	2.2	88.1
32	3	2.2	88.1
33	1	.7	91.1
34	3	2.2	93.3
35	9	6.7	100.0
Total	135	100.0	

Table-II. Frequency table of 100G OGTT

	Frequency	Percent	Valid percent	Cumulative percent
Yes	14	10.4	10.4	10.4
No	121	89.6	89.6	100.0
Total	135	100.0	100.0	

GDM is more prevalent in multiparous patient as out of 14 patients diagnosed to have GDM only 2(14.28%) were primigravida.

DISCUSSION

Gestational diabetes mellitus is defined any degree of glucose intolerance with onset or first recognition during pregnancy regardless of whether diabetes persists after

Table-III. Frequency table of FBG

	Frequency	Percent	Valid percent	Cumulative percent
Yes	22	16.3	16.3	16.3
No	113	83.7	83.7	100.0
Total	135	100.0	100.0	

Table-IV. Frequency table of agreement

	Frequency	Percent	Valid percent
Yes	117	86.7	86.7
No	18	13.3	13.3
Total	135	100.0	100.0

Table-V. Crosstab between fbs and 100G OGTT

OGTT		FPG		Total
		Yes	No	
	Yes	9	5	14
	No	13	108	121
Total		22	113	135

Table-VI. Measure of agreement

SYMMETRIC MEASURES				
Measure of Agreement Kappa	Value	Asymp. Std Error[b]	Approx. T[a]	Approx. Sig.
	.427	.110	5.135	.000
No. of valid cases	135			

a. Not assuming the null hypothesis
b. Using the asymptotic standard error assuming the null hypothesis

pregnancy[1,2]. There is no consensus regarding the optimal approach to screening for GDM. This study showed that fasting blood glucose can be carried out for screening of GDM.

The mean age estimated in this study was 27.15±3.70 which is close to a study by Sikandar H Khan[24]. These also show that differences for age between patients were not significant enough with or without GDM.

In present study the prevalence of GDM (diagnosed by 100g OGTT) was 10.4% which is in concordance with similar studies by Perucchini D, et al (10.2%)[30] and Khalil E, et al(13.5%)[31]. But contradictory to some other studies by Khan et al (3.2%) and Fatima et al (3.45%)[32,33]. This difference may be attributable to risk factor of family history of GDM included in the study. The results of study by Fatima et al favors this fact as it shows 10.4% patients with GDM having positive family history[33].

With regard to gravidity of women developing GDM, the study showed that out of 14 patients diagnosed having GDM only two were primigravida i.e. 85.71% were multigravida. In contrast to it Premchand et al have observed more occurrence of GDM in primigravida[34]. Serriat et al noticed that 42.7% of their patients were primigravida, where as Akhtar and his colleagues found a higher incidence (59.95) of GDM in multigravida[35,36]. However Granat et al and his colleagues did not find any correlation between parity and alteration of carbohydrate metabolism in their study[37]. So this study have similar result to Akhtar et al while contradictory to others.

The present study showed agreement between fasting blood glucose and 100g OGTT in 86.7% patients which is more than shown by Ayach et al (48.68%)[27] for screening of GDM. The difference of result could be due to difference of studied population. However both show that fasting blood glucose is a good investigation along with risk factor for screening of GDM at 24th-28th week of gestation.

As mentioned earlier this study revealed that screening for GDM can be carried out using FBG level. Some studies have shown similar results[29,38,39] but many other studies available in literature contradict this finding[28,40,41].

These differences in results may be due to different reasons as e.g. different people take different kind of diets. The effect of prior feeding, which may be a traditional fried bread style breakfast or simply a cup of tea may not help standardize patient preparedness and thus differences due to prior feeding may appear and confound the diagnosis[42].

In addition to this the presentation of GDM in the local population seems to be different from the Western set-ups, as most of the studies which recommend a screening approach other than performing a GCT have not been done in Western set-ups[43,44]. So, in our set-up a point can be made for using FBG as a screening test in GDM in high risk patients.

There are many recent studies which have also recommended the use of FBG as a screening modality for the diagnosis of GDM[43,44,45].

At the end it should be acknowledged that this study had some limitations: It was a hospital based study including only high risk patients. The sample size was not very large. However it suggests that a more comprehensive epidemiologically based survey should be done to further favor or disagree the results.

The clinical implication of the results of study is very important. As fasting blood glucose is a cheaper, convenient, practical and easily interpretable test. By finding its importance in screening can change the existing protocol for screening of gestational diabetes.

CONCLUSIONS

Gestational diabetes is a common entity in our set-up. Fasting blood glucose is a good test of choice for screening of GDM in high risk patients. It provides a simple and more practical investigation to both patient and clinician. As it avoids the inconvenience of taking glucose solution in pregnant women, patient compliance is much better with this. However patients screen positive should undergo 100g OGTT for confirmation of GDM.

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