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A Study To Calculate the Prevalence of Gestational Diabetes Mellitus Using 75 gm of Oral Glucose Challenge Test in a Tertiary Care Centre

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Abstract
Background: *Gestational diabetes mellitus is a common cause of maternal and fetal morbidity and mortality worldwide. The quoted prevalence of GDM ranged from 1 to 14%. Hyperglycemia during pregnancy is found to be associated with various maternal and perinatal adverse outcomes. Screening of all pregnant females to be done so that timely intervention could potentially avoid the fetus being affected by maternal hyperglycemia.*
Method: *500 women were subjected to 75 gm glucose challenge test irrespective of their last meal and duration of pregnancy and venous blood was drawn after 2 hours. The plasma glucose was estimated by glucose oxidation and peroxidation (GOD-POD) method by using Bayer's kit.*
Results: *Among 500 pregnant women, 55(11%) were diagnosed as GDM by WHO criteria. The result shows the prevalence increases with advance maternal age and increased gravidity. There is a strong association of GDM with raised BMI and family history of diabetes. However, amongst gestational age groups highest prevalence was noticed among those between 21-24 weeks of gestation.*
Conclusion: *A short term intensive care gives a long pay off in the primary prevention of obesity, IGT and diabetes an offspring as preventive medicine start before birth.*
Keywords: *Gestational dibetes mellitus , Glucose challenge test, Diabetes.*

Introduction

Gestational Diabetes Mellitus (GDM) is defined as glucose intolerance that begins or is first detected during pregnancy. The quoted prevalence of GDM ranged from 1 to 14 %. GDM affects ~10% of all pregnancies, resulting in > 200,000 cases per year[1] of all pregnancies complicated by diabetes .GDM accounts for ~90%. depending on population sample and diagnostic criteria, the prevalence may range from 1 to 14%.[2]

The prevalence in women with defined high risk factors such as being older than 25 years, being obese or having a family history of diabetes ranges from 3.3% to 6.1%.[2] They are at risk of development of type 2 diabetes in approximately 50% of cases in later life.[3] It is seen that there is much higher rate of maternal and fetal compromise in diabetic pregnancies as compared with normal pregnancies.[4] Diabetic mothers are exposed to an increased risk of hypertension in late preganncy.[5] Long term complication to the offspring include an increased risk of glucose intolerance, diabetes and obesity.[6] Maternal complication associated with GDM include

hypertension, preeclampsia and an increased risk of cesarean delivery.[7]

Screening of GDM is recommended because of its asymptomatic nature and a proportion of patients had no classic risk factors.

Rationale of GDM screening is that allows identification of GDM and hence treatment disposition thereby reducing the associated maternal and neonatal risk.

Material and Methods

The present study was carried out in the Department of Obstetrics and Gynaecology (KRH) of GRMC in collaboration of Central Pathology Laboratory of Gajra Raja Medical College, Gwalior for a period of one year October 2016 to September 2017.

500 women were subjected to 75 gm anhydrous glucose challenge test irrespective of their last meal and duration of pregnancy and venous blood was estimated by glucose oxidation and peroxidation (GOD-POD) method by using Bayer's kit.

The data was analysed by computer software Microsoft Excel for Windows and epi info version 8.0 CPC, Atlanta, GA.

Inclusion criteria

- Woman at least 18 years of age and not under guardianship.
- Healthy singleton pregnancy after spontaneous conception or after infertility treatment.
- Signed informed consent.

Exclusion criteria

- Known preexisting diabetes mellitus or treatment with metformin or under insulin.
- Known chronic infection like hepatitis or HIV or chronic kidney, liver or heart disease.
- Known maternal history of hypertensive disease in a precious pregnancy and now under prophylactic acetylsalicylate treatment.
- Previous bariatric surgery.

Results

The mean age of pregnant women in the study was between 18-36 years. Among 650 females recruited for GCT, 500 completed the project and data derived from these patients were used for analysis.

Table 1: Overall prevalence of GDM in pregnant females

	No. of cases	Percentage
Diabetic	55	11%
Non-diabetic	445	89%

Table no 1 shows that among 500 pregnant women, 55(11%) were diagnosed as GDM by WHO criteria. The prevalence was 11%.

Table 2 : Prevalence of GDM by age group

Age group (years)	No. of cases (n=55)	Percentage
18-25	12	22%
26-29	16	29%
≥ 30	27	49%

As per table no 2 the prevalence proportion increased with age. Maximum number of cases were found in age ≥ 30 years with regard to age effect, a model of linear end trend was statistically significant ($p<0.05$).

Table 3: Prevalence percentage of gestational diabetes by body mass index

Body mass index	No. of cases	Percentage
> 30	25	45%
Between 25-29	15	27%
Between 21-24	12	22%
< 20	3	5%

As shown in table no 3 the prevalence of GDM increased with increasing BMI.

Table 4 : Prevalence of GDM by gravidity

Gravidity	No. of cases	Percentage
P1	9	16%
P2	13	24%
P3	18	33%
P4	25	45%

As per table no 4 the prevalence proportion of GDM increased with increasing gravidity.

Table 5: Prevalence of gestational DM with family history of diabetes

	No. of cases (n=55)	Percentage
Family history of diabetes	33	60%
No family history of diabetes	22	40%

As shown in table no 5 positive family history of diabetes was documented in 33(60%) GDM women out of 55 diagnosed as GDM.

Table 6 : Prevalence of gestational diabetes in regard to gestational age

Gestational diabetes mellitus	No. of cases (n=55)	Percentage
16-20 weeks	3	5%
21-24 weeks	7	13%
25-28 weeks	15	27%
29-32 weeks	30	55%

As shown in table no 6 out of 55 GDM women, 3(5%) were diagnosed between 16-20 weeks. 30 (55%) women were having gestation between 29-32 weeks.

Discussion

Gestational Diabetes Mellitus offers an important opportunity for the development, testing and implementation of clinical strategies for diabetes prevention.

Timely action taken now in screening all pregnant women for glucose intolerance, achieving euglycemia in them and ensuring adequate nutrition may prevent in all probability, the vicious cycle of transmitting glucose intolerance from one generation to other.

Seldom, a pregnant women visiting the antenatal clinic for the first comes in the fasting state. If she asked to come on another day in fasting state, she may not return. Hence it is important to have a test that detects glucose intolerance without the women necessarily undergoing fasting state and it is preferable to perform the diagnostic test at the first visit.

Our study was conducted to calculate the prevalence of gestational diabetes mellitus using 75 gm of oral glucose tolerance test in a tertiary care centre in the antenatal OPD.

The study included, 650 females recruited for the GCT, 500 completed the project between the 16 to 32 weeks of gestation were subjected for the screening test.

In present study, 55 out of 500 pregnant women were diagnosed as GDM by WHO criteria. The prevalence in present study was 11%. Seshiah et al screened 3674 pregnant women with 2 hr 75 gm glucose tolerance test in various parts of the country and the overall prevalence was 16.2%. In a study by Zargar et al determined the prevalence GDM in Kashmiri women was 3.8%. The present study is comparable to Seshiah et al.[8]

Zargar et al[9] also found the GDM prevalence increased steadily with increasing age (from 1.7% in women below 25 years to 18% in women 35 years of older).

In present study, prevalence proportion increased with increasing age. Maximum number of cases i.e. 27 (49%) patients had age group $\geq$ 30 years. Seshial et al[8], Jindal et al[10] in his community based study found that age $\geq$ 25. BMI $\geq$ 25 and family history of diabetes were found to be risk factors for GDM.

In present study 25(45%) patients were having BMI > 30. Seshial et al had the same finding in his study. Dahiya et al[11] reported 20% risk of obesity in GDM population in their study.

In present study positive family history of diabetes was documented in 33(60%) GDM women out 55 diagnosed as GDM. Women with family history of diabetes are 6.4 times more prone for developing GDM in their pregnancies. Seshial et al[8], Jindal et al[10] found the same association of family history of diabetes i.e. risk of having GDM in pregnancy increases with family history of diabetes.

Similar study was conducted in SLB Medical College Cuttack over 500 subjects for a period of 2 years reported positive family history in 16 cases out of 26 diagnosed cases of GDM (61.5%).[12] The result of this study is similar to our.

In present study prevalence proportion of GDM increased with increasing gravidity. Dahiya et al[11] found the multigravidity as the main risk factor for GDM.

Out of 55 GDM women 3(5%) diagnosed between 16-20 weeks 7(13%) between 21-24 (weeks) 15(27%) between 25-28 weeks and 30(55%) between 29-32 weeks of gestation. GDM was diagnosed in 12.4% in 16 weeks of gestation, 23%

between 17-23 weeks and remaining 64.6% at more than 24 weeks of gestation by Seshiah et al. Dahiya et al found 4(11.4%) was diagnosed with in 16 weeks, 31(88.6%) between 24-28 weeks of gestation.

Conclusion

The detection of gestational dibetes mellitus during pregnancy provides an opportunity to identify women at risk of short term and long term complications. We now have evidence that early diagnosis and intervention can reduce the adverse maternal and perinatal outcomes. Therefore, oral glucose tolerance test with 75 gm of glucose is recommended as a single step screening and diagnostic test for GDM.

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