



## Screening of Gestational Diabetes Mellitus with Glucose Challenge Test in High Risk Group

Amita Gupta, Yudhishter Vir Gupta, Surinder Kumar, Reeta Kotwal

### Abstract

The present study of screening for gestational diabetes mellitus was carried out in 480 high risk women attending Suvidha Mother & Child Nursing Home. The patients underwent glucose challenge test with 50 gm glucose (GCT) using glucometer, between 18-20 weeks and if negative the test was again done after 28 weeks. All the 120 patients with abnormal GCT were subjected to 3 hours 100gm oral glucose tolerance test (OGTT) and 49 patients were found to have abnormal GTT. 3.05% of women were found to have gestational diabetes. Sensitivity of glucose challenge test in detection of gestational diabetes in high risk group was 40.5%. The incidence of PIH in patients with abnormal GCT was 22.5%. Since screening of high risk group was done with the help of glucometer it required no extra laboratory facilities, long waiting period or trained manpower. It has no side effects and guarantees good compliance of patient. GCT hence is a reliable method to detect gestational diabetes mellitus in high risk group.

### Key Words

GCT, OGTT, Gestational Diabetes

### Introduction

Gestational diabetes has been associated with fetal as well as neonatal morbidity and mortality. However with early diagnosis and treatment perinatal morbidity and mortality due to this disease can be decreased. Traditionally obstetricians have used glucose tolerance test (GTT) for the pregnant women who manifest certain risk factors like family history of diabetes, previous birth of large babies, previous adverse obstetric outcome etc. (1). Since GTT is a very time consuming method & glucose challenge test (GCT) can be used as other alternative in patients with high risk factors. Hence, the present study was undertaken to find out the efficacy of GCT in detection of gestational diabetes in high risk group.

### Material and Methods

This study was carried out from Jan 1999- Dec.2002 at Suvidha Mother & Child Nursing Home, Jammu. Out of 1605 women delivered during this period, 480 women were categorised as high risk according to criteria discussed in following paragraph. The high risk women were screened for gestational diabetes with 50gm GCT

after 18 weeks and if GCT was negative then the test was repeated after 28 weeks of pregnancy.

The risk factors considered for classification were family history of diabetes, previous baby more than 4 kg, H/O unexplained still birth, polyhydramnios, congenitally malformed baby, recurrent abortions, obesity, glucosuria, recurrent monilial infection, polyhydramnios, recurrent folliculitis and IUGR. (2). The patients who were having an abnormal GCT were subjected to OGTT.

### Method of performing GCT

**The screening test :** This test was performed as a routine OPD procedure. 50 gm of glucose was dissolved in 200 ml of water and the patient was asked to drink it within 5 minutes. The time was noted and the patient was asked to come back after an hour for the test. A capillary blood specimen was obtained and tested for blood sugar levels by glucometer. If the blood sugar levels were greater than 140mg %, the screening test was considered positive and these patients were

From Suvidha Mother and Child Nursing Home, Talab Tillo, Jammu-180016 (J&K) India.

Correspondence to : Dr. Amita Gupta, Suvidha Mother and Child Nursing Home, Talab Tillo, Jammu-180016 (J&K) India.



subjected to OGTT to confirm the diagnosis of gestational diabetes.

### Method of performing OGTT.

Initial blood sample was taken after 10-16 hours of fasting and the patient was asked to drink within 5 minutes 100gm glucose dissolved in 200-400 ml water. Blood samples were taken at 1 hour, 2 hour and 3 hours. The glucose values of fasting 105mg/dl, 1 hour-190mg/dl, 2 hour-165 mg/dl and 3 hours-145 mg/dl. were considered normal.

A patient was considered to have gestational diabetes if two or more values were elevated.

### Analysis

The analysis was performed with the help of statistical software Epi-info version 6.2. Proportions were calculated for the qualitative variables. The diagnostic discrimination of GCT& OGTT were described in terms of sensitivity and specificity.

### Observations

Out of 480 high risk patients who underwent GCT 120 patients were having an abnormal GCT. Out of this 49 were having abnormal GTT. Profile of patients with abnormal GCT in high risk group is shown in Table I&II.

**Table- 1**  
No. of Patients (n=120)

Age of Women (yrs.)	(Abnormal GCT)
20 -24	59
25 - 29	27
30 - 34	28
35 - 39	6

**Table -II**  
No. of Patients

Gravida	(Abnormal GCT)
Primi	30
Multi	90

**Table - III**

Weight of Newborn* (Kg)	No. of Patients (Abnormal GCT)
<2.5	2
2.5 - 3.5	80
3.5 - 4.0	35
> 4.0	3

\*Mean Wt. 2.92 Kg

The birth weight of babies in patients of abnormal GCT was in the range of 2.5 - 3.5 kg. (Table III). Three patients with abnormal GCT gave birth to babies >4 kg. The APGAR score at the time of birth in all these new born was 10/10. There was no fetal loss, no congenital abnormality in this group. Maximum number of mother are in age group of 20-24 as depicted in Table No. 1.

All of them underwent OGTT, 49 (10.2%) patients were found to have abnormal GTT in high risk group. 27 (22.5%) patients with abnormal GCT were having PIH

### Discussion

The incidence of gestational diabetes varies between 3-12 % (3). Compared to European women, prevalence of gestational diabetes has increased eleven fold in women from the Indian subcontinent. In our study of 1605 patients the incidence of gestational diabetes figures 3.05 %. In high risk group the incidence of gestational diabetes is 10.2% in our study.

Das *et al* (4) in their study of 300 women (106 high risk + 194 low risk) found 61 with positive screening. Out of them 12 were diagnosed as gestational diabetes. Among the 12 gestational diabetics, 10 (9.4%) belonged to high risk group. Our results are comparable. Bhattacharya *et al* (5) found the incidence of gestational diabetes in high risk group to be 8%. Maheshwari *et al* 1989 (6) and Kummur *et al* 1993 (7) found the incidence of gestational diabetes to be 4.9 % and 5.5 % respectively. Various aspects of patient's medical history, family history and obstetric history have been advocated as a means of identifying population at risk for gestational diabetes. This group deserves diagnostic testing. 50gm GCT was found to be very sensitive (40.5 %) in detection of gestational diabetes. in high risk group. Coustan *et al.* (8) found that current ACOG recommendations result in sensitivity of 65 %.

Higher perinatal mortality rate in uncontrolled gestational diabetes has been reported previously. However among our diabetic patients there was no perinatal mortality and no congenital malformation in the fetus. Average birth weight of baby was between 2.5-3.5 kg in patients with abnormal GCT. The average age group of patients with abnormal GCT was 25-30 yrs. Maximum number of patients (90) with abnormal GCT were multigravida. American college of obstetricians and gynaecologists (9) has recommended screening for gestational diabetes using 50 gm/ 1 hour



GCT for all pregnant women aged 30 yrs or older and for women with risk factor. Kini *et al.* (10) opined that 50 gm GCT should be repeated in 3rd trimester as it yields a large number of gestational diabetics. Due to the simplicity, acceptability, sensitivity and cost effectiveness of GCT, it is the best method to detect gestational diabetes mellitus in high risk group.

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