



EARLY SCREENING FOR GESTATIONAL DIABETES USING SINGLE STEP PROCEDURE AND ITS OUTCOME

Obstetrics & Gynaecology

Dr Anusha Shetty*	Junior Resident, Dept. Of Obstetrics And Gynacology, Dr. VMGMC, Solapur. *Corresponding Author
Dr Vidya Tirankar	Professor And HOD, Dept. Of Obstetrics And Gynacology, Dr. VMGMC, Solapur.
Dr Prachi Jain	Junior Resident, Dept. Of Obstetrics And Gynacology, Dr. VMGMC, Solapur.
Dr Shyamli Bondarde	Junior resident, Dept. Of Obstetrics And Gynacology, Dr. VMGMC, Solapur.

ABSTRACT

Background: India has the second largest diabetic population in the world. Gestational diabetes is a subtype which shows a constant increase. **Aims And Objective:** To estimate the incidence glucose intolerance among early pregnancy (12 to 16 weeks) among and to assess the maternal and fetal outcomes of the pregnancy. **Material And Methods:** A prospective observational study was carried out among pregnant women attending the OPD of OBG department at a tertiary care hospital during the period February 2023 to 2024. All pregnant women in their early weeks of gestation (12-16weeks) attending the Antenatal care OPD during the study period. Single step oral glucose tolerance test was done to classify as positive and negative for gestational diabetes. All the study participants were followed up till delivery and the outcome were assessed. **Results:** The mean age of study participants was 24.7 ± 5.6 years with majority from the lower middle class (42.1%) and residing at rural area (71.7%). Out of the total 700 women screened for GDM in early pregnancy, 37 (5.2%) tested positive based on the single step method. Presence of any complication, polyhydramnios, need for caesarean delivery and macrosomia was more among GDM mother which was statistically significant ($p < 0.05$). **Conclusion:** One-step approach to detect GDM in early pregnancy was useful to detect glucose intolerance during the early pregnancy and initiate appropriate management.

KEYWORDS

Gestational Diabetes, Screening, Outcome, OGTT

INTRODUCTION

India is considered the diabetic capital of the world having about 212 million people suffering from diabetes. [1] Gestational diabetes mellitus (GDM) is one of the subtypes of diabetes seen in pregnancy when there is progressive change in maternal carbohydrate metabolism due to placental hormone requiring compensatory increase in insulin production. When this compensation become inadequate GDM develops while "Pre-Gestational Diabetes Mellitus" is a term used for pregnant women who has diabetes prior to pregnancy. Both these conditions are associated with increased risk of maternal and fetal morbidity and occasionally mortality.

Earlier routine screening for GDM was not done among the low-risk women, but universal screening has been recommended for population with a very high burden of type 2 diabetes. Previous studies have also shown high prevalence of GDM among the Indian population. [2] Indian women have 11 times increased risk of developing glucose intolerance during pregnancy.[3] Generally screening for GDM is done around 24 to 28 weeks of pregnancy but testing for glucose intolerance earlier is important. As per recent guidelines, plasma glucose level more than or equal to 140 mg/dl after 2 hours of intake of 75 g oral glucose is positive for GDM. [4]

The present study has been done to estimate the proportion oral glucose tolerance test (OGTT) positive among early pregnancy (12 to 16 weeks) and also to assess the maternal and fetal outcomes of their pregnancy.

Methodology

A prospective observational study was carried out among pregnant women attending the OPD of OBG department at a tertiary care hospital and referral centre during the period February 2023 to 2024. Study participants were recruited based on the following selection criteria.

Inclusion Criteria: All pregnant women in their early weeks of gestation (12-16weeks) attending the Antenatal care (ANC) OPD during the study period.

Exclusion Criteria: Pregnant women who have already been diagnosed with diabetes mellitus and those willing to give consent.

A total of 700 study participants were recruited in the study based on the inclusion and exclusion criteria. The study was conducted only after obtaining ethics clearance from Institutional ethics committee.

Detailed information regarding the study is given to the patient and consent for the same is taken. The sociodemographic details of the patients were collected following which a clinical history and general examination was done and the information was documented in a predesigned case sheet proforma.

To detect the blood glucose level, single step procedure as per DIPSI guidelines was used. The pregnant women were asked to take a solution of 75 gm glucose powder and dissolve it in 300 ml of water, sip by sip over a period of 5 to 10 minutes. In case vomiting occurred within 30 minutes of drinking the solution, the test was stop and the women was asked to repeat the test after 2 to 3 days. If vomited occurred after 30 minutes then the test was continued as usual. The blood sample was collected after 2 hours and sent to the laboratory for testing by glucose oxidase/peroxidase method.

Test was considered positive if the value was more than or equal to 140 mg/dl. These patients were diagnosed as GDM and treated as per glucose intolerance with Medical Nutrition Therapy (MNT) or with Oral hypoglycemic agent (OHA), or with Insulin accordingly. Values less than 140 mg/dl was considered negative and patients was asked to follow up with repeat test between 24-28 weeks. Both patients with positive and negative results were followed till delivery and during puerperal period and maternal and fetal outcome were noted.

OBSERVATION AND RESULT

A total 700 antenatal mothers were included of the final analysis. The mean age of study participants was 24.7 ± 5.6 years with majority from the lower middle class (42.1%) and residing at rural area (71.7%). (Figure 1)

Out of the total 700 women screened for GDM in early pregnancy, 37 (5.2%) tested positive based on the single step method.

Table 1: Sociodemographic details of the study participants (N=700)

Variable	Frequency	Percentage
Age (in years)		
18-23	310	44.3
24-29	371	53.0
30-35	19	2.7
Socioeconomic status		
Upper class	23	3.3

Upper middle	201	28.7
Lower middle	295	42.1
Lower	181	25.9
Residence		
Urban	198	28.3
Rural	502	71.7
Parity		
Primi	335	47.9
Multipara	365	52.1
Gestational week		
11-12	78	11.1
13-14	349	49.9
15-16	273	39.0

Among the 37 women who tested positive for OGTT, 10 were asked to follow MNT, 21 were given OHA and 6 were started on insulin. During the follow-up treatment, 32 needed no treatment while 4 had to be continued of OHA and 1 patient was on insulin. (Table 2)

Table 2: Treatment for GDM given among OGTT test positive patients (n=37)

At the time of diagnosis	Frequency	Percentage
MNT	10	27.0
OHA	21	56.8
Insulin	6	16.2
Further treatment		
No treatment	32	86.5
OHA	4	10.8
Insulin	1	2.7

OHA-Oral hypoglycemic agent, MNT-Medical nutrition therapy

The presence of any complication among those patients who were OGTT positive was 67.6% while OGTT negative was only 7.2%. This difference was statistically significant (p=0.000). Similarly, the presence of polyhydramnios was more among the OGTT positive (16.2%) than negative (0.9%) with a significant difference (p=0.000). The proportion of patients undergoing caesarean delivery among the OGTT positive group was 35.1% while that among OGTT negative was 10.7% this difference was also statistically significant (p=0.000). The presence of hypertension related disorders and APH was similar among both the group (p>0.05). (Table 3)

Table 3: Maternal outcome of OGTT test positive versus negative (N=700)

Maternal outcome	OGTT negative N=663	OGTT positive N=37	Chi-square P value
Any complication			
Yes (n=73)	48 (7.2%)	25 (67.6%)	136.5
No (n=627)	615 (92.7%)	12 (32.4%)	0.00*
Hypertension			
Yes (n=18)	16 (2.4%)	2 (5.4%)	1.25
No (n=682)	647 (97.6%)	35 (94.6%)	0.26
Polyhydramnios			
Yes (n=12)	6 (0.9%)	6 (16.2%)	48.76
No (n=688)	657 (99.1%)	31 (83.7%)	0.00*
APH			
Yes (n=4)	3 (0.4%)	1 (2.7%)	3.12
No (n=696)	660 (99.6%)	36 (97.3%)	0.07
Mode of delivery			
Vaginal (n=616)	592 (89.3%)	24 (64.8%)	19.8
Caesarean (n=84)	71 (10.7%)	13 (35.1%)	0.00*

APH- Ante partum haemorrhage

* Statistically significant

In terms of fetal outcome, only macrosmia was seen more among OGTT positive mothers (5.4%) than negative (0.7%) which was statistically significant (p=0.005). Presence of hypoglycemia among the newborn was more among OGTT positive mother (2.7%) than OGTT negative (0.9%) but this difference was not statistically significant (p=0.28). The need for NICU admission and preterm was similar among the both the groups. (Figure 4)

Table 4: Fetal outcome of OGTT test positive versus negative (N=700)

Foetal outcome	OGTT negative N=663	OGTT positive N=37	Chi-square P value
NICU admission			
Yes (n=162)	156 (23.5%)	6 (16.2%)	1.05
No (n=538)	507 (76.5%)	31 (83.8%)	0.30
Preterm			
Yes (n=80)	78 (11.8%)	2 (5.4%)	1.4
No (n=620)	585(88.2%)	35 (94.6%)	0.23
Macrosomia			
Yes (n=7)	5 (0.7%)	2 (5.4%)	7.65
No (n=693)	658 (99.2%)	35 (94.6%)	0.005*
Hypoglycemia			
Yes (n=7)	6 (0.9%)	1 (2.7%)	1.13
No (n=693)	657 (99.1%)	36 (97.3%)	0.28

* Statistically significant

DISCUSSION

Gestational diabetes mellitus (GDM) is the presence of glucose intolerance when detected for the first time during pregnancy. [2] There have been several disagreements with regards to need for universal screening, timing of screening, type of screening method i.e one-step versus two-step and the criteria used to diagnose GDM. Currently most of the international professional bodies such as the American College of Obstetricians and Gynaecologists (ACOG), the American Endocrinology Society and Diabetes in Pregnancy Study Group of India (DIPSI) agree that GDM screening should be done for all the pregnant women. In country like India with a huge burden of diabetes, the probability of detecting pre-existing diabetes is more. [5]

The present study was conducted to estimate the prevalence of GDM in early pregnancy (12 -16 weeks) using the one step approach and was found to be positive among 37 (5.3%) out of 700 study participants. Wahi et. al. [6] conducted a similar study in Kashmir and found the prevalence of GDM to be 6.9%, similar to our study. But a study by Seshiah et. al. [7] in Tamil Nadu found a very prevalence of GDM of 17.8%, 13.8% and 9.9% among urban, semi-urban and rural pregnant women respectively. This is possible since the burden of diabetes is very high among the south states of India, thus correlating with the general population. Moreover, most of the patients in our study were from rural area which could be the reason for comparatively lower prevalence in our study.

Among the maternal and fetal outcomes we found the presence of any complication, polyhydramnios, need for caesarean delivery and macrosomia was more among GDM mother which was statistically significant (p<0.05). Wahi et. al. [6] in their study found that GDM mother had more risk of macrosomia and need for caesarean delivery, similar to ours. But this additionally found preterm delivery also to be to significantly more among GDM mothers. Kalre et. al. [8] in their study found the proportion of gestational hypertension, presence of vaginal candidiasis, abruption placenta and need for caesarean delivery to be significantly more among GDM mothers. While risk of still birth, need for NICU admission and macrosomia to be more common among GDM mothers (p<0.05). In this study additional maternal and fetal complications were documented. The presence of fetal hypoglycaemia was more among GDM mothers than those without but the difference was not statistically significant similar to our study.

CONCLUSIONS

The presence of GDM was a considerable problem among pregnant women in our setting. One-step approach to detect GDM in early pregnancy was useful to detect glucose intolerance and initiate appropriate management. We did not have any serious adverse maternal and fetal outcome in our study.

REFERENCES:

1. Zhou, B., Rayner, A. W., Gregg, E. W., Sheffer, K. E., Carrillo-Larco, R. M., Bennett, J. E. & Can, G. (2024). Worldwide trends in diabetes prevalence and treatment from 1990 to 2022: a pooled analysis of 1108 population-representative studies with 141 million participants. *The Lancet*, 404(10467), 2077-2093.

2. Metzger, B. E. (1991). Summary and recommendations of the third international workshop-conference on gestational diabetes mellitus. *Diabetes*, 40(Supplement 2), 197-201.

3. Dornhorst, A., Paterson, C. M., Nicholls, J. S. D., Wadsworth, J., Chiu, D. C., Elkeles, R. S. & Beard, R. W. (1992). High prevalence of gestational diabetes in women from ethnic minority groups. *Diabetic Medicine*, 9(9), 820-825.

4. Seshiah, V., Banerjee, S., Balaji, V., Muruganathan, A., & Das, A. K. (2014). Consensus evidence-based guidelines for management of gestational diabetes mellitus in India. *J Assoc Physicians India*, 62(7 Suppl), 55-62.

5. Mohan, V., Usha, S., & Uma, R. (2015). Screening for gestational diabetes in India: Where do we stand?. *Journal of postgraduate medicine*, 61(3), 151-154.
6. Wahi, P., Dogra, V., Jandial, K., Bhagat, R., Gupta, R., Gupta, S., & Singh, J. (2011). Prevalence of gestational diabetes mellitus (GDM) and its outcomes in Jammu region. *J Assoc Physicians India*, 59(4), 227-30.
7. Seshiah, V., Balaji, V., Balaji, M. S., Paneerselvam, A., Arthi, T., Thamizharasi, M., & Datta, M. (2008). Prevalence of gestational diabetes mellitus in South India (Tamil Nadu): a community based study. *JAPI*, 56, 329-33.
8. Kalra, P., Kachhwaha, C. P., & Singh, H. V. (2013). Prevalence of gestational diabetes mellitus and its outcome in western Rajasthan. *Indian journal of endocrinology and metabolism*, 17(4), 677-680.