Frequency of Gestational Diabetes Mellitus using Diabetes in pregnancy study group of India (DIPSI) Method

Preksha Jain[1],[*], Savita Somalwar[2], Sulabha Joshi[3]

[1]Junior Resident, [2]Lecturer, [3]Professor & HOD, Dept. of Obstetrics & Gynecology, NKP Salve Institute of Medical Sciences & Research Center, Nagpur

*Corresponding Author:
Email: prekshaenator@gmail.com

Abstract

The purpose of the study was to determine frequency of antenatal women with gestational diabetes mellitus using Diabetes in Pregnancy Study Group of India (DIPSI) recommended method. Total 487 antenatal women were included and administered 75gm glucose. All women who presented before 24 weeks of gestation and found to have PGBS <140mg/dl were tested for GDM again at around 28 to 32 weeks with minimum gap of 6 weeks between the two tests. While, for those who presented for the first time after 24 weeks, test was done only once. Out of total 487 antenatal women, there were 52 (10.7%) cases of gestational diabetes mellitus. 5 (9.6%) women out of 52 would have been missed if repeat screening was not done. The frequency of gestational diabetes mellitus was found to be quite high and hence, universal screening is recommended. This study also builds a strong reason for following DIPSI guidelines as a single-step method as both screening and diagnostic test for GDM.

Keywords: Diabetes in pregnancy, DIPSI test, Gestational Diabetes Mellitus, Screening, Single step screening method.

Introduction

Gestational Diabetes Mellitus (GDM) is defined as carbohydrate intolerance with onset or recognition during pregnancy[1] which is associated with adverse maternal and fetal outcome. GDM is thought to represent diabetes in evolution, and the increasing prevalence of GDM along with Diabetes Mellitus confirms this supposition[2]. Studies by Seshiah V et al suggest that the prevalence of GDM in India varied from 3.8 to 21% in different parts of the country, depending on the geographical locations and diagnostic methods used[3]. Worldwide, its prevalence differs according to race, ethnicity, age, body composition and screening and diagnostic criteria[4]. Women diagnosed to have GDM are also at increased risk of future diabetes predominantly Type 2 diabetes mellitus (DM) as are their children. Timely action taken 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 another[5].

Very few data is available with regard to frequency of Gestational Diabetes from Maharashtra. The present study, therefore, has compiled to serve this purpose. In the present study, the Diabetes in Pregnancy Study Group India (DIPSI) guidelines have been followed for screening of subjects, so that a uniform protocol followed by similar groups in other parts of the country could enable a fair and judicious correlation with each other. Besides, DIPSI guidelines also facilitate both economical and feasible mode of evaluation. DIPSI diagnostic criterion of 2 h plasma glucose more than 140 mg/dl with 75 g oral glucose load is a modified version of WHO guidelines in that, WHO procedure requires women to be in the fasting state, whereas DIPSI procedure is performed irrespective of the last meal timing[6].

Materials and Methods

The present study was carried out at a tertiary care hospital attached to medical college in the Department of Obstetrics and Gynecology, between November 2013 and October 2015 after approval of the Institutional Ethics Committee. Total 487 antenatal women were screened for GDM after obtaining their consent. Inclusion criteria included all singleton pregnancies and those willing for regular antenatal check-up while women who were known cases of diabetes mellitus or with multiple pregnancies or with history of pancreatitis and those not willing for any intervention were excluded. Demographic data of these women were noted. A detailed history with special reference to previous obstetric outcome, history of abortions, still births, intrauterine deaths, congenital malformations in fetus, preeclampsia, history of GDM in previous pregnancy and positive family history was taken. History of medical disorders like hypothyroidism or treatment for infertility was taken. Gestational age at first visit was noted. A thorough clinical and obstetrical examination was done. Routine investigations were sent. In addition all antenatal patients screened were

made to drink 75gm glucose dissolved in 200ml of water consumed over a period of 5 minutes, irrespective of whether she is in the fasting or non-fasting state and without regard to the time of the last meal. A venous blood sample was collected at 2 hours for estimating plasma glucose by Glucose Oxidase Peroxidase (GOD-POD) method at central laboratory of the institute.

All those women who had 2 hour post glucose blood sugars (PGBS) ≥140 mg/dl were classified as Gestational Diabetes Mellitus and who had <140 mg/dl were classified as Non-GDM. All women who presented before 24 weeks of gestation and found to have PGBS <140mg/dl were tested for GDM again at around 28 to 32 weeks with minimum gap of 6 weeks between the two tests. While, for those who presented for the first time after 24 weeks, DIPSI test was done only once.

The patients with post glucose blood sugars between 140 to 199 mg/dl were advised Medical Nutrition Therapy (MNT) under supervision of dietician and continued for 2 weeks. If MNT failed to

achieve control, i.e. FPG ~90 mg/dL and 2hr post-meal glucose ~120 mg/dL, patients were admitted and insulin was initiated and physician opinion was taken. Those with initial PGBS ≥ 200 mg/dl were started on insulin along with MNT and were admitted for sugar monitoring. Appropriate monitoring and management was done for GDM women.

Results

Table 1: Frequency of GDM among Study Population

Category	Number	%
Non-GDM	435	89.3
GDM	52	10.7
Total	487	100

Out of total 487 antenatal women included in the study, there were 52 (10.7%) cases of gestational diabetes mellitus, while remaining 435 (89.3%) cases were classified as Non-GDM as depicted in Table 1.

Table 2: Distribution of study population according to residential status

Residential Status	GDM		Non-GDM		Total = n
	Number	%	Number	%	
Urban	15	10.8	124	89.2	139
Rural	37	10.6	311	89.4	348
Total	52		435		487

Table 2 provides the distribution of antenatal women as per their residential status. Out of 487, number of antenatal women belonging to Urban area were 139 (28.5%) while, 348 (71.5%) belonged to Rural area. Among women belonging to Urban area, 15 (10.8%) had GDM and 124 (89.2%) belonged to Non-GDM group. Among women belonging to Rural area, 37 (10.6%) had GDM and 311 (89.4%) belonged to Non-GDM group.

Table 3: Distribution of study population according to Gestational Age at diagnosis of GDM by DIPSI test

Status	<24 weeks Number (%)		≥24 weeks Number (%)		Total
	<16 weeks	17-23 weeks	24-28 weeks	>28weeks	
GDM	3 (5.8)	6 (11.5)	23 [20 + 3*] (44.2)	20 [18 + 2*] (38.5)	
	9 (17.3)		43[38 + 5*] (82.7)		52
*5 GDM women diagnosed after repeat testing after 24 weeks.					

Table 3 shows distribution of study population according to gestational age at diagnosis of GDM by DIPSI test. Out of 52 GDM women, 3 (5.8%) diagnosed before 16 weeks, 6 (11.5%) women diagnosed between 17 to 23 weeks, 23 (44.2%) women diagnosed between 24 to 28 weeks and 20 (38.5%) women diagnosed after 28 weeks of gestation. Thus, 9 (17.3%) women were diagnosed as GDM before 24 weeks and 43(82.7%) women were diagnosed at or after 24 weeks. Those woman who were tested negative for GDM before 24 weeks, were again tested after 24 weeks at around 28 to 32 weeks. Among these women 5 were diagnosed as GDM in repeat testing. Among these 5 women, 3 were diagnosed between 24 to 28 weeks and 2 after 28 weeks.

Table 4: Distribution of women diagnosed as GDM in their first visit before 24 weeks and by repeat DIPSI test in second visit

DIPSI Test	Total tested	DIPSI positive	DIPSI negative
At first visit <24 weeks	49	9 (17.3%)	40
Repeat Test >24 weeks	40	5 (9.6%)	35
First visit after 24 weeks	438	38	400

As depicted in Table 4, total 52 women were diagnosed as GDM out of 487 women. Total 49 women were screened before 24 weeks, among which 9 were diagnosed as GDM. These 9 (17.3%) women would

have been missed if screening was done only at around 24-28 weeks according to older guidelines.

Remaining 40 women were again screened after 24 weeks, among which 5 women were diagnosed as GDM. These 5 (9.6%) women out of 52 would have been missed if repeat screening was not done. Thus, out of 487 women, 49 had first visit before 24 weeks and 438 women had first visit at or after 24 weeks. Out of 438 women, 38 were diagnosed as GDM at or after 24 weeks.

Discussion

In present study, the frequency of Gestational Diabetes Mellitus was 10.7% which is quite significant. The frequency in our study is comparable to studies by Anjali A (9.5%)[7] and V Balaji et al (13.4%)[8], which incorporated DIPSI guidelines. Thus, taking in account high frequency in study population, there is need for universal screening for gestational diabetes.

In our study, 71.4% women belonged to Rural area and 28.5% belonged to Urban area. Out of all GDM women 71.2% belonged to Rural area. As the present study was conducted in a tertiary care center attached to Medical College situated in rural area, the number of women from rural area was higher than from urban area. Similar are the results of the study by Kalyani KR et al[9], in which among GDM women 69.4% were from rural area and 64% belonged to urban area.

In our study out of 52 GDM women, 3 (5.8%) diagnosed before 16 weeks, 6 (11.5%) women diagnosed between 17 to 23 weeks, 23 (44.2%) women diagnosed between 24 to 28 weeks and 20 (38.5%) women diagnosed after 28 weeks of gestation. Those woman who were tested negative for GDM before 24 weeks, were again tested after 24 weeks at around 24 to 28 weeks with gap of about 6 weeks.

In present study, total 52 women were diagnosed as GDM out of 487 women. Total 49 women were screened before 24 weeks, among which 9 were diagnosed as GDM. These 9 (17.3%) women would have been missed if screening was done only at around 24-28 weeks according to older guidelines. Remaining 40 women were again screened after 24 weeks, among which 5 women were diagnosed as GDM. These 5 (9.6%) women out of 52 would have been missed if repeat screening was not done. Thus, women who had normal glucose tolerance in the first visit require repeat test in the subsequent visits. Thus, out of 487 women, 49 had first visit before 24 weeks and 438 women had first visit at or after 24 weeks. Out of 438 women, 38 were diagnosed as GDM at or after 24 weeks. In a study by V. Seshiah et al (10), out of the 741 GDM women, 16.3% were within 16 weeks, 22.4% were between 17 and 23 weeks and 61.3% were more than 24 weeks of gestation. 38.7% GDM women were diagnosed before 24 weeks and 28.9% were diagnosed on repeat testing. This difference might be as ours is mainly rural population which is associated with tendency of women to present late in their pregnancy for antenatal check-up.

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