

## Research Article

# Screening of gestational diabetes mellitus in antenatal women using DIPSI guidelines

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### ABSTRACT

**Background:** GDM is associated with serious maternal as well as fetal complications, which can be prevented by early detection & prompt treatment. There is need of universal screening of all Indian pregnant women for GDM using simple & economical screening criteria. This study uses single step OGTT as per DIPSI guidelines to find out prevalence of GDM in pregnant women attending antenatal OPD.

**Methods:** All the antenatal patients at 24-28 weeks of gestation (n = 352), attending Antenatal OPD, irrespective of their prandial state were given 75 gm glucose and venous blood samples were collected after 2 hours of oral glucose. A report of  $\geq 140$  mg% were labeled as GDM as per DIPSI guidelines.

**Results:** Out of 506 subjects screened, 33 (6.52 %) were positive for GDM.

**Conclusions:** Low prevalence of GDM may be because of less sensitivity of DIPSI criteria.

**Keywords:** Gestational diabetes mellitus, DIPSI

### INTRODUCTION

Gestational Diabetes Mellitus (GDM) is defined as glucose intolerance with onset or first recognition during pregnancy.<sup>1</sup> GDM is associated with maternal as well as fetal complications including gestational hypertension, pre eclampsia, increased rate of caesarean section, fetal macrosomia, sudden intra uterine death, shoulder dystocia, birth trauma & increased perinatal mortality.<sup>2,3</sup> In GDM two generations are at risk of developing diabetes in the future. Women with a history of GDM are at increased risk of future diabetes, predominately type 2 diabetes, as are their children.<sup>4</sup> Increased prevalence of childhood type 2 DM in the last 30 years is attributable to increasing exposure to maternal GDM.<sup>5</sup> This Vicious cycle is likely to influence and perpetuate the incidence and prevalence of glucose intolerance in any population.<sup>6</sup> GDM represents a health care burden which can be

expected to rise as the frequency of obesity increases worldwide.<sup>7</sup> India is emerging as capital of diabetes mellitus with ever increasing cases of GDM. Indian women have 11 fold increased risk of developing glucose intolerance during pregnancy compared to Caucasian women.<sup>8</sup>

Early detection & prompt treatment of GDM has been shown to reduce the risk of these complications and future health care burden on health system of the country.

There is lot of controversy concerning optimal strategy for the detection and diagnosis of GDM. There are various screening & diagnostic criteria's for GDM like ADA (American Diabetes Association) WHO (World Health Organization), IADPSG (International Association of Diabetes & Pregnancy Study Group) & ACOG (American College of Obstetrics & Gynecology),

American Endocrinology Society, The Canadian and Australian Diabetes Association. Most of these criteria's recommend 2-3 step procedures, needs fasting sample & screen only high risk population. This is not suitable in Indian context where prevalence of GDM is high so, needs universal screening with simple procedure which is economical & feasible.

The Diabetes In Pregnancy Study group India (DIPSI) has come up with practice guidelines for screening for GDM.<sup>9</sup> Antenatal patients irrespective of their fasting status will be given 75 gms glucose and samples will be taken after two hours to detect blood sugar level. This one step procedure of challenging women with 75 gm glucose irrespective of their fasting status and diagnosing GDM is simple, economical and feasible.<sup>10</sup>

This study is being carried out to find out prevalence of GDM, using DIPSI guidelines, in pregnant women attending antenatal OPD of SKNMC & GH, Pune.

## METHODS

This study was carried out in the Department of Obstetrics & Gynecology in collaboration with Department of Biochemistry. The study protocol was approved by the Institutional Ethical Committee. Study was carried for 12 months (July 2013 to June 2014) All the pregnant women with normal random blood sugar level in first trimester attending antenatal OPD participated in the present study. Patients of overt diabetes mellitus (random blood glucose level  $\geq 200$  mg/dl before 24 weeks of gestation) were excluded from the study. Detailed obstetric history, relevant clinical examination data obtained from all subjects after explaining the study procedure. They were screened for GDM at 24-28 weeks of gestation. Irrespective of their fasting status all the study subjects were given 75 gms of anhydrous glucose (Readily available in market) dissolved in 200 ml of water. After 2 hours of oral glucose, 1 ml of venous blood sample was collected in fluoride-oxalate bulb for estimation of blood sugar level. Samples were centrifuged immediately and plasma was separated. Plasma glucose level was estimated using GOD-POD method using Erba system packs on Transasia XL-360 fully automated clinical chemistry analyzer.<sup>11</sup> A report of  $\geq 140$  mg% was diagnosed as GDM. A reading of 120-140 mg% was labeled as decreased gestational glucose tolerance (DGGT). Values more than 200 gm% indicate overt diabetes mellitus.<sup>9</sup> All the required facilities and equipment were available in the department of biochemistry. The study did not involve any harm to the any patient involved.

### Statistical analysis

Prevalence of GDM was calculated using Microsoft Office Excel 2010.

## RESULTS

Out of 506 subjects screened by DIPSI guidelines, 33 were positive for GDM. So prevalence of GDM is 6.52% among pregnant women attending antenatal OPD of Institute (Table 1).

**Table 1: Prevalence of GDM as per DIPSI guidelines.**

Screening as per DIPSI guidelines	Subjects (n)	Prevalence of GDM
Positive for GDM	33	6.52%
Negative for GDM	473	
Total subjects screened	506	

## DISCUSSION

India is emerging as capital of diabetes mellitus with ever increasing cases of GDM. Indian women have 11 fold increased risk of developing glucose intolerance during pregnancy compared to Caucasian women.<sup>8,12,13</sup> The recent data on the prevalence of GDM in our country was 16.55% by WHO criteria of 2 hr PG  $\geq 140$  mg/dl.<sup>6</sup> Therefore universal screening during pregnancy has become important in our country.

Various screening & diagnostic criteria for GDM like ADA (American Diabetes Association) WHO (World Health Organization), IADPSG (International Association of Diabetes & Pregnancy Study Group) & ACOG (American College of Obstetrics & Gynecology), American Endocrinology Society, The Canadian and Australian Diabetes Association adds to the confusion regarding optimal strategy for the detection & diagnosis of GDM. Most of these criteria's recommend 2-3 step procedures, needs fasting sample & screen only high risk population. Developing countries like India, faces several challenges for universal screening with above mentioned criteria due to inadequate infrastructure to face this much screening load. We need simple screening procedure which is economical, practical & feasible.

Diabetes In Pregnancy Study group India (DIPSI) has come up with practice guidelines for screening for GDM.<sup>9</sup> Antenatal patients irrespective of their fasting status will be given 75 gms glucose and samples will be taken after two hours to detect blood sugar level. This one step procedure of challenging women with 75 gm glucose irrespective of their fasting status and diagnosing GDM is simple, economical and feasible.<sup>10</sup> A report of  $\geq 140$  mg% was diagnosed as GDM. A reading of 120-140 mg% was labeled as decreased gestational glucose tolerance (DGGT). Values more than 200 gm% indicate overt diabetes mellitus.<sup>9</sup>

This study is being carried out to find out prevalence of GDM, using non fasting DIPSI guidelines, in pregnant women attending antenatal OPD of Smt. Kashibai Navale Medical College & General Hospital, Pune.

We screened 506 subjects for GDM using DIPSI criteria. We could find out 33 cases of GDM. Therefore, prevalence of GDM is 6.52% by this study (Table 1). There are some studies which differ in prevalence found in this project. A survey performed at antenatal clinic at Chennai, found 16.2% prevalence of GDM by considering 75 gm 2 hour plasma glucose level with OGTT done in fasting state.<sup>6</sup> The prevalence of GDM ranged from 9.9% to 17.8% in a study conducted in south India using fasting DIPSI criteria.<sup>14</sup> Parikh P et al found 13.79 % prevalence of GDM in a OPD based study.<sup>15</sup> Gopalkrishnan et al reported very high prevalence of GDM ( 41.9%) using IADPSG criteria in North Indian population in Lucknow (n=322).<sup>16</sup> Basis of this less prevalence can be explained by some studies which deal with the sensitivity of non fasting DIPSI criteria. Women in India with GDM Strategy (WINGS) while validating the non fasting DIPSI criteria, found that it has very low sensitivity (27.7%) compared to the WHO criteria and even lower sensitivity in comparison with IADPSG criteria (22.6%) although specificity was quite high.<sup>17</sup> A study from Delhi similarly reported that the no fasting DIPSI criteria results in low sensitivity.<sup>18</sup> Thus two independent studies from different geographic locations showed that the DIPSI no fasting OGTT is not suitable as a diagnostic test as it can miss a considerable number of women with GDM. One of the compelling arguments for a non fasting test has been that most pregnant women will not come back for an OGTT in the fasting state.<sup>19</sup> The WINGS study however showed that 78.5% of women did report for the second OGTT done in the fasting state, even though no incentives were provided to the women.

Despite some limitations in terms of less number of subjects & not being a population based study, the findings of this study were significant and consistent with other recent studies addressing GDM screening.

## CONCLUSIONS

We believe that the results of our present work combined with previous studies put a question mark on sensitivity of non fasting DIPSI criteria for universal screening of GDM. Hence, further studies are required to devise highly sensitive screening & diagnostic criteria which are practical & feasible in Indian set up.

Low prevalence of GDM may be because of less sensitivity of DIPSI criteria.

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