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Original Research Article

## Gestational diabetes mellitus - need for universal screening - a clinical study in a tertiary care centre

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### ABSTRACT

**Background:** To study the prevalence of gestational diabetes mellitus among antenatal mothers and to assess the importance of universal screening to detect gestational diabetes mellitus (GDM).

**Methods:** A total of 300 antenatal women irrespective of gestational age were screened for GDM at their antenatal visit during the period of January 2020 to June 2020. All women were screened with 75gm oral glucose load irrespective of last meal followed by blood glucose estimation by glucose oxidase peroxidase method 2 hours following glucose load. A cut-off of 140mg/dl or more were labelled as gestational diabetes mellitus as per DIPSI guidelines.

**Results:** Out of 300 antenatal women tested, 24 women (8%) were positive for gestational diabetes mellitus. During the first, second and third trimesters 12.5%, 33.33% and 54.17% were diagnosed with gestational diabetes mellitus respectively. The number of gestational diabetes mellitus patients for the age groups  $\leq 20$  years, 21-25 years, 26-30 years and  $>30$  years are 2 (8.33%), 3 (12.5%), 8 (33.33%) and 11 (45.83%) respectively. The number of pregnant women tested positive for gestational diabetes mellitus with BMI  $\leq 18.5$ , 18.6-24.9, 25-29.9 and 30-35 are 2 (8.33%), 4(16.67%), 8(33.33%) and 10(41.67%) respectively.

**Conclusions:** Prevalence of GDM in our study is 8%. About 29.16% of GDM did not have any risk factors. This emphasizes the importance of universal screening for GDM of all pregnant women irrespective of gestational age. There is an increased association of GDM with age, BMI, family history and parity according to our study.

**Keywords:** DIPSI, Gestational diabetes mellitus, Universal screening

### INTRODUCTION

Gestational diabetes mellitus is defined as glucose intolerance of varying severity with onset or first recognition during pregnancy. Prevalence of GDM is increasing globally especially in Asian women.<sup>1</sup> GDM is associated with adverse maternal and perinatal outcomes that include preeclampsia, polyhydramnios, increased operative intervention, macrosomia, congenital anomalies, Intra uterine growth restriction, Intra uterine death and subsequent childhood and adolescent obesity. Women with history of GDM are at increased risk of

future diabetes predominantly type 2 diabetes. Early imprinting (i.e. in intrauterine life) is believed to have effects later in life, so their children are at increased risk of childhood obesity and diabetes in adulthood. So two generations are at risk.<sup>2</sup> Therefore it is important to diagnose early and treat promptly to prevent complications. GDM has become public health priority as stillbirth rate is high in India and one of the causes is GDM.<sup>3</sup> High prevalence of diabetes and genetic predisposition to metabolic syndrome exists among Asians particularly among Indian women as they are at 11 fold increased risk of glucose intolerance compared to

Caucasians.<sup>4</sup> So this predisposes Indian women to develop GDM and its complications in all trimesters of pregnancy. Prevalence of GDM in India varies from 3.8 to 21% in different parts of the country, depending on geographical locations and diagnostic methods used.<sup>5-7</sup>

So there is a need for cost effective, simple universal screening and diagnostic method. This initiated us to conduct a study on universal screening for GDM irrespective of gestational age by DIPSI method.

## METHODS

This was a prospective study conducted in the department of OBG at Kurnool medical college, Kurnool from January 2020 to June 2020.

### Inclusion criteria

All antenatal women attending antenatal clinic for the first time irrespective of gestational age.

### Exclusion criteria

Women already diagnosed with overt diabetes mellitus, women who had not given written consent for the study

A total of 300 antenatal women attending antenatal clinic for the first time for registration and those coming for follow up visit, irrespective of their gestational age were selected for the study. The details of age, height, weight, occupation, family history of diabetes mellitus present obstetric history were obtained. Also details regarding past obstetric history such as history of GDM, stillbirth, IUD, polyhydramnios, giving birth to macrosomic baby, anomalous baby were obtained. BMI of all subjects were obtained using Quetelet Index. Blood pressure of all women were recorded. Features such as acanthosis nigricans were observed for. All the women were then given 75gm oral glucose load irrespective of last meal followed by blood glucose estimation by glucose oxidase peroxidase method two hours following glucose load. A cutoff of 140mg/dl or more were labelled as GDM as per DIPSI guidelines.

## Statistical analysis

After collecting data, statistical analysis was done by using Descriptive statistics – Mean, Standard deviation, and the inferential statistics

## RESULTS

Majority of the pregnant women who participated in the study were in the age group of 21-25 years (40.67%). The mean age of the study population was 24.85±4.12. The average BMI was 23.82±4.33. Out of 300 pregnant women, 24 were tested positive for GDM. So the prevalence in our study was 8%. Among the 24 GDM patients, 7 members (29.16%) did not have any risk factors.

**Table 1: Association of age with GDM.**

Age in years	Number of GDM patients	Percentage
≤20	2	8.33
21-25	3	12.50
26-30	8	33.33
>30	11	45.83

**Table 2: Association of BMI with GDM.**

BMI	Number of GDM patients	Percentage
≤18.5	2	8.33
18.6-24.9	4	16.67
25-29.9	8	33.33
30-35	10	41.67

**Table 3: Incidence of GDM in different trimesters.**

Trimester number	Number of GDM patients	Percentage
1 <sup>st</sup> trimester	3	12.50
2 <sup>nd</sup> trimester	8	33.33
3 <sup>rd</sup> trimester	13	54.17

**Table 4: Association of GDM and other variables.**

Variable	Number of GDM patients	Percentage
Obesity	18	58.33
History of GDM in previous pregnancy	3	12.50
history of macrosomic baby	5	20.83
history of anomalous baby	0	0.00
IUD	2	8.33
family history	12	50.00
infertility	4	16.67
Hypothyroidism	6	25.00
history of miscarriage	7	29.17
Preeclampsia	5	20.83

The number of GDM patients for the age groups  $\leq 20$  years, 21-25 years, 26-30 years and  $>30$  years are 2 (8.33%), 3 (12.5%), 8 (33.33%) and 11 (45.83%) respectively (table 1). The number of GDM pregnant women tested positive for GDM for BMI  $\leq 18.5$  are 2 (8.33%) (Table 2).

Similarly for the BMI ranges between 18.6-24.9, 25-29.9 and 30-35, the number of GDM patients were 4 (16.67%), 8 (33.33%) and 10 (41.67%) respectively (Table 2). The number of GDM cases during first, second, and third trimesters were 3(12.5%), 8 (33.33%) and 13 (54.17%) respectively (Table 3).

## DISCUSSION

Diabetes mellitus is an epidemically explosive problem which is increasing at an unstoppable pace. India has the highest number of type 2 diabetes patients and has been called the diabetic capital of the world with more than 43 million diabetics in the country.<sup>8</sup> And lot of these are women in child bearing age group. Further early screening for glucose intolerance and appropriate measures could avoid some diabetic related complications in women with GDM and their new born. The prevalence of GDM in our study was 8%. In our study, prevalence of GDM increased significantly with advanced maternal age. A similar association of GDM with advanced maternal age has been reported by seshaiyah et al.<sup>4</sup>

Obesity is an important modifiable risk factor in development of GDM. In our study GDM was found to be significantly higher (75%) in women with higher BMI. A similar association has been found by Jang et al.<sup>9</sup> A significantly higher percentage of women with GDM has positive family history of diabetes mellitus (50%) in our study. Family history of diabetes mellitus has been reported to be associated with higher chances of developing GDM by kim et al.<sup>10</sup>

In our study 12.5% of patients had history of GDM in previous pregnancy and 20.83% had history of macrosomic baby in previous pregnancy. Also a significantly higher percentage of women with GDM has associated hypothyroidism (25%) and preeclampsia (20.83%). Incidence of GDM in first trimester is 12.5%, second trimester is 33.33% and third trimester is 54.17%. This high incidence noted in third trimester was because ours being a tertiary care centre, most of the antenatal women will get registered at nearby PHC for their initial antenatal check-ups and they visit tertiary care centre in third trimester for institutional delivery.

There is increased prevalence of GDM in women with advanced age, obesity, family history of diabetes mellitus. About 29.16% of GDM patients did not have any risk factors.

This emphasizes the importance of universal screening for GDM of all pregnant women irrespective of gestational age. It has been observed that BMI is a risk factor for GDM which is modifiable. So women in reproductive age group who are at risk of diabetes should undergo pre-conceptional counselling and proper life style modifications before planning pregnancy so as to prevent adverse maternal and foetal outcomes. Limitations of study were other comorbid factors were not evaluated in detail.

## CONCLUSION

Timely diagnosis and intervention is of great help in improving both short and long term health benefits of mother and baby. DIPSI test is a simple, economical and less cumbersome method for detecting GDM. Universal screening for GDM irrespective of trimesters is important as 29.16% of GDM patients did not have any risk factors.

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