



## PREVALENCE OF GESTATIONAL DIABETES MELLITUS AMONG PREGNANT WOMEN ATTENDING ANTENATAL CLINIC AT THREE URBAN HEALTH CENTRES OF BELAGAVI – A CROSS SECTIONAL STUDY

### Community Medicine

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### ABSTRACT

**Background and Objective:** Gestational diabetes mellitus (GDM) is defined as any degree of glucose intolerance with the onset or first recognition during pregnancy with or without remission after the end of pregnancy. The prevalence of GDM in India varies from 3.8 to 21% in different part of country, depending on geographical locations. GDM is associated with increased incidence of maternal hypertension, pre-eclampsia, obstetric intervention and risk of developing Diabetes mellitus (DM) in later life. Hence, this study was undertaken to find out prevalence of gestational diabetes mellitus in pregnant women attending Antenatal Clinic of three Urban Health Centres (UHCs).

**Methodology:** This one year cross sectional study was done in three UHCs Ashok Nagar, Ram Nagar and Rukmini Nagar, which are urban field practice area of Jawaharlal Nehru Medical College, Belagavi. Data was collected from 360 pregnant women attending the antenatal clinic of three UHCs. Woman was given a standardized 75gm of oral glucose load, irrespective of whether she was in fasting or non fasting state and without regard to time of last meal, and plasma glucose was estimated at 2 hours by using Diabetes in Pregnancy Study group India (DIPSI criteria) and all women with a plasma glucose of  $\geq 140$  mg/dl were diagnosed to have GDM.

**Results:** The prevalence of GDM in this study was 12.2%. In the present study mean age of study participants was  $24.3 \pm 3.92$  years. Mean BMI of the study participants was  $22.48 \pm 3.05$  kg/m<sup>2</sup>.

**Conclusion:** In this study there is a greater prevalence of GDM in women with increasing age, higher parity. There is a need for universal screening to pick up gestational diabetes mellitus to prevent both maternal and fetal morbidity. Based on these results it concluded that, the diagnosis of GDM based on DIPSI method is a convenient, quick and cost effective

### KEYWORDS

Gestational Diabetes Mellitus, DIPSI Criteria, Pregnant women, Antenatal clinic.

### INTRODUCTION

Gestational Diabetes mellitus (GDM) is defined as any degree of glucose intolerance with the onset or first recognition during pregnancy with or without remission after the end of pregnancy.<sup>1</sup> GDM occur in women in whom beta cell function is not able to overcome the antagonism created by anti insulin hormones of pregnancy. An increase in beta cell mass and insulin secretion in the fetus occurs by the early weeks of gestation, in response to maternal hyperglycemia.<sup>2</sup> GDM is associated with increased incidence of maternal hypertension, pre-eclampsia, obstetric intervention and risk of developing DM in later life. Major morbidities associated with infants of diabetic mothers include respiratory distress, growth restriction, polycythemia, hypoglycemia, congenital malformations and perinatal mortality.<sup>3</sup> It is estimated that around (1-14%) of all pregnant women worldwide develop GDM.. The prevalence of GDM in India varied from 3.8 to 21% in different part of the country, depending on the geographical locations and diagnostic method used. GDM has been found to be more prevalent in urban areas than in rural areas.<sup>4</sup> Appropriate diagnosis and management of GDM can improve maternal and perinatal outcome. It is possible that a higher prevalence of GDM may be present among the urban population due to the adoption of unhealthy life style. Limited studies regarding the prevalence of GDM among the urban population has been reported from Karnataka. Diagnosis In Pregnancy Study Group India (DIPSI) method is easy to perform, costeffective and causes least disturbances in a pregnant woman's routine activities. Hence, this study is undertaken to estimate the current prevalence of GDM in urban area of Karnataka. This study may also provide evidence for routine screening of all pregnant women using DIPSI method.<sup>5</sup>

### METHODOLOGY

This one year cross sectional study was done during 1<sup>st</sup> January to 31<sup>st</sup> December 2014 in three UHCs Ashok Nagar, Ram Nagar and Rukmini Nagar, which are urban field practice area of Jawaharlal Nehru Medical College, Belagavi. Data was collected from 360 pregnant women attending the antenatal clinic of three UHCs irrespective of period of gestation. The sampling method adopted was systematic random sampling technique. After obtaining written informed consent, a pretested questionnaire was used to collect information regarding socio-demographic details.<sup>4</sup> And to diagnose Gestational diabetes mellitus DIPSI method was used. In this procedure after undergoing preliminary examination, a pregnant woman was given 75gm of oral glucose load, irrespective of whether she was in fasting or non fasting

state and without regard to time of last meal. Venous blood sample was collected at 2-hours for estimating plasma glucose under aseptic precautions. The blood sample was collected in Sodium Fluoride bulb and sent to laboratory of Biochemistry department of J. N. Medical College, Belagavi. GDM was diagnosed if 2-hours plasma glucose is  $\geq 140$ mg/dl. Numerical variables were analysed as means and standard deviation. SPSS version 16 was used for analysis of data. Ethical clearance was obtained from the Institutional Review Board of Jawaharlal Nehru Medical College, Belagavi.

### RESULTS

**TABLE 1:** Prevalence of GDM based on DIPSI criteria.

Gestational diabetes mellitus	No.	%
Present	44	12.2
Absent	316	87.8
<b>Total</b>	<b>360</b>	<b>100</b>

In the present study the prevalence of GDM according to DIPSI criteria was 12.2%.

**TABLE 2 Distribution of study subjects according to age group**

Age group in years	No.	%
$\leq 19$	37	10.3
20-24	170	47.2
25-29	101	28.1
$\geq 30$	52	14.4
<b>Total</b>	<b>360</b>	<b>100</b>

Of the 360 pregnant women who participated in the study, 37 (10.3%) were in the age group of  $\leq 19$  years, 170 (47.2%) were in the age group of 20-24 years, 101 (28.1%) were in the age group of 25-29 years and 52 (14.4%) were in  $\geq 30$  years age group.

**TABLE 3 Distribution of study subjects according to BMI**

BMI Categories (Kg/m <sup>2</sup> )	No.	%
Underweight( $<18.5$ )	21	5.8
Normal (18.5 to 22.9)	186	51.7
Overweight (23 to 24.9)	85	23.6
Obese ( $>25$ )	68	18.9
<b>Total</b>	<b>360</b>	<b>100</b>

In the present study, majority of pregnant women 186 (51.7%) had

normal BMI, 85 (23.6%) were overweight, 68 (18.9%) were obese and only 21 (5.8%) were underweight. Mean BMI of the study participants was  $22.48 \pm 3.05$  kg/m<sup>2</sup>. Range was 16.82-34.89 kg/m<sup>2</sup>.

## DISCUSSION

The prevalence of GDM in India varies from 3.8% to 21.0% in different parts of the country, depending on the geographical locations and diagnostic methods used. In the present study the prevalence of GDM based on DIPSI criteria was found to be 12.2%. There is wide variation in the prevalence of GDM in India. There are different studies conducted in various cities in India revealed prevalence of GDM as 13.4% in Chennai<sup>5</sup>, 6.94% in Jammu<sup>6</sup>, 6.6% in Western Rajasthan<sup>1</sup>, 2.5% in Guntur, South India<sup>7</sup>, and 7.8% in Kashmir.<sup>8</sup> Another study done in Tamil Nadu<sup>9</sup> showed that GDM was detected in 17.8%, 13.8% and 9.9% respectively in the women of urban, semi-urban and rural areas. However the wide variation in the prevalence rates of GDM may be attributed to the use of different criteria for diagnosis, variation in different geographical region.

In present study the mean age group of the study participants was  $24.3 \pm 3.92$  years. Of the 360 pregnant women who participated in the study, 10.3% were in the age group of  $\leq 19$  years, 47.2% were in the age group of 20-24 years, 28.1% were in the age group of 25-29 years and 14.4% were in  $\geq 30$  years age group, whereas study conducted in Kashmir<sup>8</sup> showed that there were no participants  $< 19$  years and half of the participants were in the age group of 26-30 years and only 1.3% study participants belonged to age group  $> 35$  years. Another study done in Guntur, South India<sup>7</sup> showed 53% study participants belonged to age group 21-25 years and only 4% belonged to  $> 30$  years of age.

In the present study, majority of pregnant women 186 (51.7%) had normal BMI, 85 (23.6%) were overweight, 68 (18.9%) were obese and only 21 (5.8%) were underweight. Mean BMI of the study participants was  $22.48 \pm 3.05$  kg/m<sup>2</sup>. Range was 16.82-34.89 kg/m<sup>2</sup>.

## CONCLUSION

The prevalence of GDM is 12.2% in the present study and there is a greater prevalence of GDM in women with increasing age, increasing BMI and There is a need for universal screening to pick up gestational diabetes mellitus to prevent both maternal and fetal morbidity. Larger studies are needed to analyse the risk factors for GDM in Indian women and plan for preventive strategies and to improve maternal and neonatal outcomes. Based on these results it concluded that, the diagnosis of GDM based on DIPSI method is a convenient, quick and cost effective.

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