Screening of Gestational Diabetes among Women Visiting Metabolic Clinic in the Department of Biochemistry of a Medical College in Eastern U.P

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ABSTRACT

**Background:** Gestational diabetes mellitus (GDM) is a diabetic metabolic disorder that occurs in 4% of all pregnant women and 14% of ethnic groups with more prevalence of type II diabetes. It can be defined as increased or abnormal insulin resistance, decreased insulin sensitivity or glucose intolerance with first diagnosis during pregnancy. Aims/Objectives: 1. To find out prevalence of GDM. 2. To study associated risk factors.

**Methods:** The study was conducted at the metabolic clinic in the department of Biochemistry located at SIMS, Hapur. A semi-structured pretested questionnaire was used for data collection. Following the DIPSI guidelines, patients with plasma glucose values >140 mg/dl were labeled as GDM. Statistical methods used were OR (CI95%), percentage, Chi square.

**Results:** Out of 500, 6.72% had GDM. Among all GDM patients, 64.71% had age more than 30 years, 70.59% had BMI more than 25, 41.18% had gravida more than 3 and p-value was significant with regard to age and BMI. P value was found to be significant for risk factors namely positive family history of Diabetes Mellitus, history of big baby and presence of more than one risk factor.

**Conclusion:** GDM is associated with high BMI, early pregnancy loss, family history of DM and previous history of big baby and there could be more than one risk factor. Thus, universal screening followed by close monitoring of the pregnant women for early detection of GDM may help improving maternal and fetal outcomes.

**Keywords:** Diabetes Mellitus, GDM, BMI, Gravida.

INTRODUCTION

Prevalence of gestational diabetes mellitus (GDM) is known to vary widely depending on the region of the country, dietary habits, and socio-economic status. This study was undertaken to determine the prevalence of GDM and risk factors associated with it, in women attending metabolic clinic at a tertiary care hospital in SIMS, Hapur, Uttar Pradesh. This study enrolled women, with their estimated gestational age between 24th and 28th week. After informing, women who consented to participate were given a standardized 2-h 75 g oral glucose tolerance test (OGTT). A proforma containing general information on demographic characteristics, socio-economic status, family history of diabetes and/or hypertension and past history of GDM was filled up. American Diabetes Association (ADA) criteria for 75 g 2-h OGTT was used for diagnosing GDM. Prevalence of diabetes is increasing globally, particularly in the developing world; China and India being major countries contributing to increasing burden. India is projected to have the highest cases of people with diabetes in the world, by 2030.1 The rise in prevalence is attributed to ageing population, urbanization, rising obesity, unhealthy diets and physical inactivity, in addition to the genetic predisposition of South Asians to diabetes. 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

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**Access this article online**

Website: www.iabcr.org

**Quick Response code**

DOI: 10.21276/iabcr.2019.5.1.04

**How to cite this article:** Sinha V, Kachhawa P. Screening of Gestational Diabetes among Women Visiting Metabolic Clinic in the Department of Biochemistry of a Medical College in Eastern U.P. Int Arch BioMed Clin Res. 2019;5(1):12-14.

**Source of Support:** Nil, Conflict of Interest: None
the end of pregnancy is associated with higher incidence of maternal diabetes mellitus later in life. Poor glycemic control during pregnancy is associated with high morbidities and mortalities among mothers and infants. Therefore, appropriate diagnosis and management of GDM will improve maternal and fetal outcome. The prevalence of GDM varies widely in India. According to a nationwide survey in India in 2002, prevalence of GDM was estimated to be 16.55 percent. Uttar Pradesh is the largest state in India, with population of 230 million, 4.5 million pregnancies every year and has high maternal & Infant Mortality Rate. The present study was carried out with the following objectives:

1. To find out the prevalence of GDM among the study population.
2. To study the associated risk factors.

**METHODS**

This cross-sectional study was conducted at the metabolic clinic in the department of Biochemistry, SIMS. Inclusion criteria: Women with estimated duration of pregnancy between 24 to 28 weeks of gestation, attending the metabolic outdoor clinic. Exclusion criteria: Women having gestation period less than 24 weeks or more than 28 weeks of gestation, women with history of Diabetes Mellitus prior to the onset of pregnancy, multiple pregnancy and major chronic diseases including cancer were excluded.

All the women were informed about the nature of the study and those who gave the consent were included in the study. Using semi-structured pretested questionnaire, data was collected which included socio-demographic and personal information such as height, weight, family history of Diabetes Mellitus, history of pregnancy loss. The sample size for the present study was calculated considering the findings of national wide survey. Assuming the permissible error of 20 percent at level of significance of 95%, a total of 500 women was required. The participants were given 75 grams of oral glucose irrespective of the meals and their plasma glucose was estimated at 2 hours. Patients with plasma glucose values >140 mg/dl were labeled as GDM and the rest as non-GDM group. All the women were investigated for risk factors namely family history of Diabetes, history of big baby (Birth weight more than 3.5 kg) and presence of more than one risk factor.

Statistical analysis:

Results were expressed using SPSS (version 20.0). Odd’s ratio CI at 95% was calculated using cross table analysis among GDM & NGDM groups. Chi square test was applied and p value <0.05 were considered significant.

**RESULTS**

A total of 500 cases were included in the study. The findings of socio-demographic profile of the cases showed that there were 388 (76.88%) Hindus, 96 (19.37%) Muslim and 18 (3.75%) belonged to other religion respectively whereas 294 (58.50%) respondents were from village background. As regards, GDM, 34 (6.72%) respondents were diagnosed to have pregnancy with Gestational Diabetes Mellitus (GDM) of Type 2 variety; whereas 470 (93.28%) did not have Gestational Diabetes (Non GDM). Thus, the prevalence of Diabetes Mellitus was 6.72 percent. All the respondents were examined with regard to age, Body Mass Index (BMI), Gravida and history of abortion.

**Table 1: Distribution of patients with regard to Age, BMI and Gravida**

<table>
<thead>
<tr>
<th>Variable</th>
<th>GDM (n=34) (100)</th>
<th>Non GDM (n=472) (100)</th>
<th>OR</th>
<th>95% CI</th>
<th>Chi Square value</th>
<th>P value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age &gt;28 Years</td>
<td>20 (60.59)</td>
<td>240 (46.82)</td>
<td>2.06</td>
<td>1.00-4.30</td>
<td>4.06</td>
<td>Significant at 0.05</td>
<td></td>
</tr>
<tr>
<td>BMI &gt;26</td>
<td>24 (70.59)</td>
<td>244 (51.69)</td>
<td>2.24</td>
<td>1.05-4.79</td>
<td>4.45</td>
<td>Significant at 0.05</td>
<td></td>
</tr>
</tbody>
</table>

**DISCUSSION**

The variation in the prevalence of GDM in India could be due to local, cultural context. In addition, other factors that could influence the variation of GDM prevalence could be technical issues such as sample drawn from urban or rural part, ethnicity, higher education, higher BMI and obesity diagnostic methods used. High prevalence of GDM among Indian population could be due to trend towards older maternal age, decrease in physical activity and adoption of modern lifestyles, and increasing prevalence of obesity in urban area. Wahl et al found higher prevalence of GDM with regard to higher education, higher BMI. The findings of the present study are in agreement with the findings of Wahl et al, with regard to high prevalence associated with BMI more than 25. Wide geographical variation has been observed in prevalence of GDM in by some authors in different parts of India. In the present study in SIMS, Hapur,
of GDM was 6.72 percent. However, the corresponding figure in a study in Gujarat, by Parikh Pallav et al \cite{12} the prevalence was 13.79 percent. The variation could be due to the socio-geographical differences as documented in other studies. The GDM prevalence was found to be 3.8% in Rajasthan \cite{13}, 6.6% in Haryana \cite{14}, 13.9% in Haryana. In the present study, the association of age and diabetes was found to be statistically significant. However, Verma et al \cite{16} did not find it to be significant. It could be due to a different study design which was limited to rural population of Jammu. Significant association was found with regard to BMI in GDM. Similar observation has been noted in the other studies. \cite{15, 17} in India. Since BMI is a modifiable risk factor for prevention of maternal / fetal complications associated with gestational diabetes mellitus, advice on life-style modifications even during pre-pregnancy and pregnancy period would be highly beneficial. Association of family history of Diabetes Mellitus and history of early pregnancy loss among women with GDM was in agreement with the study undertaken by Pike Saxena et al \cite{18} in a tertiary level hospital in North India. In the present study, there was no association of presence of GDM and history of early pregnancy loss. It could be due to the fact that pregnancy loss could be due to many other reasons such as accident, stress, infections. In the context of rising and varied prevalence of GDM in India, it is important to note the association of various risk factors while examining the pregnant women. Early diagnosis and timely treatment of gestational diabetes not only improve the maternal and fetal outcome pregnancy but also will facilitate prevention of morbidities and mortalities of mothers and infants.

CONCLUSION

The study highlights importance of taking cognizance of various risk factors such as BMI, history of early pregnancy loss, family history of DM and previous history of big baby. Thus, universal screening considering all risk factors especially while taking history of the patient, followed by close monitoring and management of the pregnant women may facilitate early detection of GDM and help improving maternal and fetal outcome in India and U.P, in particular.

Ethical approval: It was taken for this. Study from the Institutional Ethics Committee.

Limitations of the study: Since it was a cross sectional study, the other maternal / pregnancy outcome related risk factors such as vaginal candidiasis, abortion placenta, intrauterine death, macrosomia, still birth etc. were not studied.

REFERENCES

10. Special bulletin on Maternal Mortality in India 2010-12. SRS, Office of Registrar General, India.