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Evaluation of Prevalence of Gestational Diabetes Mellitus in Pregnant Females at a Tertiary Care Hospital in Andhra Pradesh

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ABSTRACT

Background: Pregnancy is associated with insulin resistance (IR) and hyperinsulinemia that may predispose some women to develop diabetes. Clinical detection of GDM is carried out to identify pregnancies at increased risk for perinatal morbidity and mortality. Hence; the present study was conducted for assessing the prevalence of gestational diabetes mellitus in pregnant females in a tertiary care hospital.

Materials & Methods: A total of 500 pregnant subjects were evaluated. Pregnant females were screened and enrolled. Screening of all the subjects was done for evaluation of presence of GDM. Diagnosis of GDM was done as per the ADA criteria. Women who were already diagnosed with diabetes were excluded from the study. Demographic and social history of all females was recorded in paper-based case-report forms. Medical records were reviewed for recent haemoglobin levels, fasting blood sugar levels (FBS) and other clinical parameters. All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis using SPSS software.

Results: GDM was present in 18.4 percent of the subjects.

Urban residence, positive family history of GDM and obesity were found to be significant risk factors for occurrence of GDM.

Conclusion: The prevalence of GDM was high in the current study with obesity and positive family history being significant risk factors.

Key words: Diabetes, Gestational, Pregnant.

INTRODUCTION

Pregnancy is associated with insulin resistance (IR) and hyperinsulinemia that may predispose some women to develop diabetes. Gestational diabetes has been defined as any degree of glucose intolerance with an onset, or first recognition during pregnancy. This definition does not exclude the possibility that unrecognized glucose intolerance may have antedated the pregnancy, and so, the term hyperglycemia in pregnancy emerges to be more appropriate as suggested lately by the Endocrine Society. The International Association of Diabetes and Pregnancy Study Groups (IADPSG) classify hyperglycemia first detected during pregnancy as either 'overt diabetes' or 'gestational diabetes mellitus (GDM)'. In 2013, the World Health Organization (WHO) recommended that hyperglycemia first detected during pregnancy be classified as either 'diabetes mellitus (DM) in pregnancy' or 'GDM'.[1-4] Clinical detection of GDM is carried out to identify pregnancies at increased risk for perinatal morbidity and mortality.

Available data do not identify the threshold of maternal glycemia at which such risk begins or increases rapidly. A multinational study, the Hyperglycemia and Adverse Pregnancy Outcome study, is underway to explore this issue in a large multiethnic cohort. In the absence of a defined glucose threshold for perinatal risk, many different sets of glycemic criteria have been proposed and are employed worldwide for the diagnosis of GDM.[5-8]

In high-risk patients, a fasting plasma glucose level of more than 7.0 mmol/l or a random glucose level of 11.1 mmol/l meets the American Diabetes Association (ADA) criteria for the diagnosis of diabetes mellitus. The test should be repeated and if still within the criteria stated above, the diagnosis of diabetes is confirmed and there is no need to perform any further screening tests.[9,10] Hence; the present study was conducted for assessing the prevalence of gestational diabetes mellitus in pregnant females in a tertiary care hospital.

MATERIALS & METHODS

The present study was conducted in Department of Obstetrics and Gynaecology, Maharajah's Institute of Medical Sciences, Vizianagaram, Andhra Pradesh (India) for assessing the prevalence of gestational diabetes mellitus in pregnant females. A total of 500 pregnant subjects were evaluated. Pregnant females were screened and enrolled. Screening of all the subjects was done for evaluation of presence of GDM. Diagnosis of GDM was done as per the ADA criteria.[11] Women who were already diagnosed with diabetes were excluded from the study. Demographic and social history of all females was recorded in paper-based case-report forms. Medical records were reviewed for recent haemoglobin levels, fasting blood sugar levels (FBS) and other clinical parameters. All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis using SPSS software. Univariate analysis was done for evaluation of results.

Table 1: Prevalence of GDM

GDM	Number	Percentage
Present	92	18.4
Absent	408	81.6
Total	500	100

Table 2: Comparison of variables

Variable		GDM (n=92)	Non-GDM (n=408)	P-value
Mean age (years)		29.3	30.1	0.56
Residence	**Rural**	19	193	0.00 (Significant)
	Urban	63	215	
Positive family history of GDM		45	51	0.01 (Significant)
Obesity		53	62	0.02 (Significant)

RESULTS

A total of 500 pregnant subjects were analyzed. among these 500 subjects, GDM was present in 18.4 percent of the subjects. Mean age of the subjects with GDM and without GDM was 29.3 years and 30.1 years respectively. Non-significant results were obtained while comparing the age among GDM and non-GDM. Urban residence, positive family history of GDM and obesity were found to be significant risk factors for occurrence of GDM.

DISCUSSION

Gestational diabetes mellitus (GDM) is a common pregnancy complication, in which spontaneous hyperglycemia develops during pregnancy. According to the most recent (2017) International Diabetes Federation (IDF) estimates, GDM affects approximately 14% of pregnancies worldwide, representing approximately 18 million births annually. Risk factors include overweight/obesity, westernized diet and micronutrient deficiencies, advanced maternal age, and a family history of insulin resistance and/or diabetes. While GDM usually resolves following delivery, it can have long-lasting health consequences, including increased risk for type 2 diabetes (T2DM) and cardiovascular disease (CVD) in the mother, and future obesity, CVD, T2DM, and/or GDM in the child. Determination of pathways influencing development of these metabolic disorders may also shed light on GDM, and potentially accelerate opportunities for prevention and/or treatment.[11, 12]

Insulin resistance during pregnancy stems from a variety of factors, including alterations in growth hormone and cortisol secretion (insulin antagonists), human placental lactogen secretion (which is produced by the placenta and affects fatty acids and glucose metabolism, promotes lipolysis, and decreases glucose uptake), and insulinase secretion (which is produced by the placenta and facilitates metabolism of insulin). In addition, estrogen and progesterone also contribute to a disruption of the glucose insulin balance. Increased maternal adipose deposition, decreased exercise, and increased caloric intake also contribute to this state of relative glucose intolerance.[13, 14] Hence; the present study was conducted for assessing the prevalence of gestational diabetes mellitus in pregnant females in a tertiary care hospital.

In the present study, GDM was present in 18.4 percent of the subjects. Urban residence, positive family history of GDM and obesity were found to be significant risk factors for occurrence of GDM. Ahmed, D.A et al assessed the prevalence and the risk factors of GDM. The study included 355 nondiabetic pregnant women at 24–28th weeks of gestation. Follow-up of GDM cases was done at 6–12 weeks postpartum by OGTT 75g glucose to detect progression to type 2 DM. Our study has shown that the prevalence rate of GDM was 12.4% among the studied group. Family history of DM was the most prevalent risk factor with a highly significant positive relation that occurred in 73.3% of GDM cases (P<0.001) compared with 32.5% in non-GDM cases. BMI more than 30 was another important risk factor demonstrated in their study as a significant association was found between prevalence of GDM and obesity (BMI >30) was found in 50% of women with GDM (P<0.001) compared with 21.2% in non-GDM cases.[14] Siddiqui, Samreen et al conducted the study at three different regions of North India to estimate the prevalence of GDM. Their pilot prospective cross-sectional study was conducted at three centres of North India with a base at Max Super Speciality Hospital, Saket, New Delhi, over a period of 10 months (December 2015–October 2016). Pregnant females attending gynaecology clinic at these centres were screened and enrolled as per the study inclusion criteria, after taking informed consent. Medical records were reviewed for recent haemoglobin levels, fasting blood sugar levels and other clinical parameters. A total of 230 participants were enrolled in this study with 65 from Muzaffarpur, 65 from Bhilai and remaining 100 from Delhi, which

include a mixed population. The overall prevalence of GDM was observed as 10%, with a regional prevalence of 10.77% at Bhilai, lower prevalence at Muzaffarpur (3.07%) and 14% in Delhi with a mixed population. A significant difference ($P < 0.01$) was observed in the mean age and body mass index of participants at Bhilai, Muzaffarpur and Delhi.[15]

CONCLUSION
The prevalence of GDM was high in the current study with obesity and positive family history being significant risk factors.

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