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RESIDING IN FIELD PRACTICE AREA OF SKMCH, MUZAFFARPUR, BIHAR

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ABSTRACT Gestational diabetes mellitus (GDM), defined as diabetes diagnosed in second and third trimesters of pregnancy, has emerged as a global public health problem. In India alone, GDM complicates nearly 4 million pregnancies annually. **METHODOLOGY:** A hospital-based study was conducted from October 2018 to March 2019. The study population comprised of pregnant women between 24 and 28 weeks of gestational age attending the OPD at obstetrics department during the study duration. The sample size of 226 was attained during the study period. The data were entered and analyzed using SPSS (version 16). **RESULTS:** A total of 226 pregnant women participated in the study. Venous blood sampling showed 50 study participants to have GDM, that comprised of 22.1% of the study population. **CONCLUSIONS:** Several studies from different parts of India have reported association between occurrences of GDM and obesity/high BMI. This may be due to increased demands on maternal metabolism during pregnancy.

KEYWORDS : Gestational diabetes mellitus (GDM), Pregnancy.

INTRODUCTION

Gestational diabetes mellitus (GDM), defined as diabetes diagnosed in second and third trimesters of pregnancy [1], has emerged as a global public health problem [2]. In India alone, GDM complicates nearly 4 million pregnancies annually, representing large subset of population at high risk for adverse perinatal morbidity and mortality if left inappropriately managed [2]. Beyond perinatal implications, GDM marks beginning of a vicious cycle in which diabetes begets more diabetes [3, 4] leaving a legacy for both affected mother and her offspring to face impending long-term consequences. As substantiated by "fetal origin of adult disease" hypothesis [5], perpetuation of this ongoing cycle needs check to avoid occurrence of unfavorable consequences in future generations. Considering wide range of GDM prevalence in the country, its early identification assumed national significance.

It has implications for the mother and the fetus both. Maternal complications such as pre-eclampsia, stillbirths, macrosomia and need for caesarean section and neonatal outcomes such as hypoglycemia and respiratory distress are few to name [6, 7]. There is an increased risk of developing type 2 diabetes in females who had GDM in previous pregnancy [8]. Interestingly, data also suggest that children of mothers who had diabetes in pregnancy are at higher risk of developing diabetes later in life as compared to their siblings born to the same parents in a non-GDM pregnancy [9]. Indian women have 11 times more risk of developing GDM as compared to women in other parts of the world [10]. The prevalence of GDM in India varies in different regions with a reported prevalence of 3.8% in Kashmir [11], 9.5% in Western India [12], 6.2% in Mysore[13] and 22% in Tamil Nadu [14]. Differences in the prevalence rates across India could be attributed to differences in age, body mass index (BMI), socioeconomic status of females and cultural differences as well. Different screening and diagnostic criteria could also be responsible for different prevalence rates.

With this background in mind, this study was planned to estimate the prevalence of GDM and find its association with various socio demographic factors.

METHODOLOGY

The present study was conducted by the Department of Preventive and Social Medicine of Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar. The screening for GDM is still not universal. The study was conducted based on the "National Guidelines for Diagnosis and Management of GDM," Ministry of Health and Family Welfare, Government of India, December2014 [15].

Study design and study population

An observational study was conducted from October 2018 to March 2019. The study population comprised of pregnant women between 24 and 28 weeks of gestational age attending health care centers and camps organized by the researcher during the study period.

Sample size calculation

The sample size was estimated considering 16.55% prevalence of GDM reported previously [16]. The sample size of 375 was calculated. However, a sample of 226 could be attained during the study period.

Inclusion and exclusion criteria

Pregnant women between 24 and 28 weeks of gestational age were included who were attending antenatal clinic of SKMCH, Muzaffarpur. Pregnant mothers who were known cases of diabetes and those who refused to participate were excluded from the study.

Sampling technique

All pregnant women eligible to be included in the study, attending the urban and the rural training centers of Department of Preventive and Social Medicine of SKMC & H, Muzaffarpur during the study period were included in the study. Apart from this, camps were organized in the remote area under the catchment of the department. Different areas with low ANC coverage were identified with the help of local field workers. Four such areas were enlisted each from the urban and the rural areas.

Screening method and data collection

Team of two members was made including medical interns, residents and social workers. Pregnant women with the above inclusion criteria were invited to participate in the study. After obtaining written consent, one step procedure was offered to pregnant women by giving 75 g of anhydrous glucose dissolving in 200–250 ml of water. The intake of solution was completed within 5 min. After that, necessary sociodemographic information and anthropometric

information was collected in predesigned pro forma. The study participants remained in separate premises provided for their rest. Two hours after the glucose load, the capillary blood sample was taken by pricking with lancet and blood glucose level was measured by glucometer on the spot.The results of blood glucose level were recorded and also communicated to the pregnant women. At the same time, venous blood was also collected and sent to laboratory for 2 h post-glucose load level estimation. The venous blood sample testing was done at laboratory designated and approached by the researcher.

In both the above-mentioned methods, glucose level of >140 mg/dL was taken as cutoff for the diagnosis of GDM. If required, pregnant women were referred to obstetrician/ physician for further management.

Data analysis and ethical issues

The data were entered and analyzed using SPSS (version 16). Data were expressed as frequencies, percentages, and appropriate statistical tests such as Chi-square test. An ethical clearance was taken from the institutional ethical committee for conducting the study.

RESULTS

A total of 226 pregnant women participated in the study. Venous blood sampling showed 50 study participants to have GDM, that comprised of 22.1% of the study population. None has past history of GDM or currently diagnosed DM, hypertension. Only 3(1.5%) participants reported family history of diabetes. Background characteristics and obstetric history has been shown in table 1.

Characteristic		Total pregnant women included in the study N (%)	Pregnant women diagnosed with GDM N (%)
Age (in years)	< 20	27 (11.9)	4 (6.9)
	21-25	136 (60.1)	28 (58.3)
	26-30	51 (22.7)	12 (23.6)
	>30	12 (5.8)	8 (11.1)
Education	Illiterate	116 (51.2)	23 (45.8)
Parity	Nullipara	147 (64.1)	40 (80.6)
	1-2	49 (22.1)	6 (12.5)
	>2	31 (13.8)	4 (6.9)
Complete ANC appropriate to period of gestation	Yes	148 (65.3)	17 (34.7)
	No	78 (34.7)	33 (65.3)
Pre- pregnancy BMI (in kg/m^2)	< 18.5	22 (9.8)	8 (16.7)
	18.5 – 24.99	142 (54.6)	27 (54.2)
	25-29.99	49 (22.1)	12 (23.6)
	>30	32 (13.9)	3 (5.6)

Chi-square test was done to establish association of GDM with various factors considered in the study that was reported to be significant with pre pregnancy BMI. Women who were obese before they conceived the current pregnancy were more at risk to develop GDM.

DISCUSSION

DM is a growing epidemic in India, and GDM is not an exception. Various studies reported different rate of GDM prevalence ranging from 3.8% in Kashmir [17], 6.6% in Rajasthan [18], 6.94% in Jammu [19], 7.1% in Haryana [20],9.5% in Western India [21],18.9% in Tamil Nadu [22], to as high as 35% in Punjab[23]and 41% in Lucknow [24].The present study reported a prevalence of 22.08% of GDM with venous blood testing done by glucose oxidase test. Majority of the GDM cases were in younger females [20, 22], in contrast to other studies who reported GDM with increasing age. [18, 19].

Ante Natal Care services were good and availed by majority of the pregnant women in the area. More than half of the study participants received full ANC appropriate to their gestational age. Interestingly, more than half of the cases of GDM was among those who had incomplete history of ANC during the current pregnancy. GDM reported more among primigravidae compare to previous studies but no significance found in this study.Increasing parity increases risk of GDM [19, 20], but this study did not report such finding similar to previous studies [25].

Several studies from different parts of India have reported association between occurrences of GDM and obesity/high BMI [18, 22, 23].Similarly, pre pregnancy obesity reported as a risk factor for GDM in the present study also. This may be due to increased demands on maternal metabolism during pregnancy from excess weight, resulting in imbalances in hormonal carbohydrate regulation mechanisms, and insulin sensitivity [18].No study participant was reported with preexisting DM, past history of GDM during previous pregnancy or with hypertension. However, various studies have reported association of GDM with family history of diabetes and hypertension [20, 22].

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