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Prevalence of gestational diabetes mellitus among antenatal mothers attending a tertiary care center in Guntur.

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ABSTRACT

Background and Aim: The prevalence of diabetes mellitus (DM) is increasing worldwide and more in developing countries including India**.** As women with gestational diabetes mellitus (GDM) and their children are at increased risk of developing diabetes mellitus in future, special attention should be paid to this population especially in developing countries**.** Because widely different prevalence rates have been observed in studies in different regions of India, multiple regional studies in different subtypes of populations are needed for quantifying prevalence data. The present study is, therefore, undertaken to study the prevalence of GDM in women attending a tertiary care hospital in Guntur. **Methodology:** This is a hospital based cross sectional study among 500 pregnant women. Sample size calculated from previous prevalence studies. In the present study, the Diabetes in Pregnancy Study Group India (DIPSI) guidelines has been followed for screening of subjects. **Results:** The prevalence of gestational diabetes mellitus is 10.4%. There is no significant variation in prevalence with age or religion. **Conclusion:** The prevalence is high and early screening is useful in proper control of sugar levels.

Key word: Gestational Diabetes Mellitus (GDM), Diabetes in Pregnancy Study Group India (DIPSI).

INTRODUCTION

Diabetes represents a spectrum of metabolic disorders, characterized by chronic hyperglycemia and disturbance in carbohydrates, fat, and protein metabolism resulting from defects in insulin secretion, insulin action, or both[1].

The prevalence of diabetes mellitus (DM) is increasing worldwide and more in developing countries including India[2]. The increasing prevalence in developing countries is related to increasing urbanization, decreasing levels of physical activity, changes in dietary patterns and increasing prevalence of obesity[1, 2, 3]. As women with gestational diabetes mellitus (GDM) and their children are at increased risk of developing diabetes mellitus in future, special attention should be paid to this population especially in developing countries[4].

GDM is defined as glucose intolerance of varying degree with onset or first recognition during pregnancy[1, 2,3,4,5].

The data regarding prevalence of GDM is important for rational planning, allocation of resources and the preventive strategies that may be undertaken in future. Prevalence of GDM varies widely. Depending on the population studied and diagnostic test employed, prevalence may range from 2.4 to 21 % of all pregnancies[6]. In a random survey performed in various cities in India in 2002-2003, an overall GDM prevalence of 16.55% was observed[2].

Because widely different prevalence rates have been observed in studies in different regions of India, multiple regional studies in different subtypes of populations are needed for quantifying prevalence data. The present study is, therefore, undertaken to study the prevalence of GDM in women attending a tertiary care hospital in Guntur.

METHODOLOGY

Study Setting: This study will be carried out in a tertiary care hospital.

Type of the Study: This is a hospital based cross sectional study.

Study Period: This present study was conducted during May and June, 2018.

Inclusion Criteria:

1. Antenatal mothers attending the tertiary care hospital.

Exclusion Criteria:

1. Antenatal mothers already diagnosed with Diabetes.
2. Antenatal mothers who don't give consent.
3. Antenatal mothers who are having any chronic illness.

Sample Design:

a) Sample Size:

Sample size was calculated from the previous prevalence studies data by using appropriate sample size calculation method.

In an earlier study done at various centers across India the prevalence of gestational diabetes mellitus was found to be 16.55 %.[(2)]

Sample size is estimated at 5% level of significance with an allowable error of 20%.
Now, using the formula

$$n = \frac{Z^2 P Q}{E^2} = \frac{(1.96)^2 \times 16.55 \times 83.45}{(3.31)^2} = \frac{5305.62}{10.956} = 484$$

Where,

n = Sample size

Z = 1.96 (area under normal curve under 95% confidence interval),

E = 3.31 (estimate being within 20 percent of true value),
P = 16.55 (prevalence of gestational diabetes),
Q = 83.45 that is (1-P),

The calculated sample size of 484 has been rounded off to 500 antenatal mothers attending the tertiary care hospital irrespective of their gestational age.

b) Sampling method: All pregnant women attending the tertiary care hospital during the study period until the required sample size are attained.

c) Sampling procedure: Convenience sampling

Ethical clearance: Institutional ethical committee accorded ethical clearance for this study.

Conduct of the study:

Method of Data Collection:

All pregnant women attending the tertiary care hospital during the study period were included in the study. All women were informed about the nature of study and those who gave consent were included in the study. The study protocol was approved by the institutional ethics committee. Women who were known diabetics, or suffering from any chronic illness were be excluded from the study.

The demographic information was collected from the study subjects by using a predesigned pretested questionnaire. Besides this blood samples were taken from the subjects to confirm the diagnosis of gestational mellitus according to DIPSI recommended method.

Diagnostic Criteria:

In the present study, the Diabetes in Pregnancy Study Group India (DIPSI) guidelines have been followed for screening of subjects, so that a uniform protocol followed by similar groups in other parts of the country could enable a fair and judicious correlation with each other. Besides, DIPSI guidelines also facilitate both economical and feasible mode of evaluation. DIPSI diagnostic criterion of 2-hour plasma glucose more than 140 mg/dl with 75 g oral glucose load is a modified version of WHO guidelines which requires women to be in the fasting state, whereas DIPSI procedure is performed irrespective of the last meal timing[7]

After obtaining the informed consent, pregnant women were given 75 g oral glucose load irrespective of their last meal timing and venous plasma was drawn at 2 hours. The plasma glucose was estimated in the central laboratory by the glucose oxidase peroxidase (GOD-POD) method[8]. The criteria for the diagnosis followed are, if the 2 h venous plasma glucose measured after 75 g oral glucose load is ≥140 mg/dl (DIPSI criteria) the patient will be labeled as GDM. If it is ≥200 mg/dl., then labeled as pre-existing diabetes, < 120mg/dl., is non diabetic and 120 to 139mg/dl., is named as decreased gestational glucose tolerance[7].

Gestational Weeks at Which Screening is Recommended:

Practically all the pregnant women should undergo screening for glucose intolerance. The usual recommendation for screening is between 24 and 28 weeks of gestation. The recent concept is to screen for glucose intolerance in the first trimester itself as the fetal beta cell recognizes and responds to maternal glycemic level as early as 16th week of gestation and if found negative, the screening test is to be performed again around 24th – 28th week and finally around 32nd – 34th week[7]. So in present the study, all antenatal mothers irrespective of their gestational age are included.

Data Analysis:

- Collected data was entered into master chart for basic analysis.
- Descriptive data was presented as frequency.
- Univariate analysis using X^2 test was done to determine significant differences and associations of various parameters with GDM

RESULTS

Table 1: Age distribution of the participants

Age(years)	Frequency	Percent
< 21	6	1.2
21 - 25	202	40.4
26 - 30	190	38
>30	102	20.4
Total	500	100

Table 2: Distribution of the participants based on Religion

Religion	Frequency	Percent
Hindu	294	58.8
Christian	65	13
Muslim	138	27.6
others	3	0.6
Total	500	100

Table 3: Gestational Diabetes Mellitus among participants

GDM	Frequency	Percent
YES	52	10.4
NO	448	89.6
Total	500	100

There is no significant variation in the prevalence of gestational diabetes mellitus by age and religion.

DISCUSSION

Our study was conducted to find out the prevalence of Gestational diabetes mellitus among antenatal mothers attending a tertiary care center in Guntur. Age and religion are the socio demographic factors included in our study.

Age distribution of the participants:

In the present study 40.4% of the participants are between 21 to 25 years followed by 38% between 26 – 30 years. The participants above 30 years are 20.4%. Below 21 years, there are 1.2%. Similar results were reported in a study conducted by Reddy et. al[9], at a tertiary care hospital in Telangana. However, there were 12.6% less than 20 years of age in the study. In a study conducted in Limbe, Cameroon[10], 31.5% (63/200) participants were in the age group 21-25 years while 31% (62/200) were in the age group 26-29 years.

Distribution of the participants based on Religion:

The study participants in our study based on religion, 58.8% are Hindus followed by 27.6% of Muslims, 13% Christians and 0.6% of other religions. Our study included the religion to see the influence of any cultural differences in the religions on prevalence of gestational diabetes mellitus. But there was no significant difference found in our study based on religion.

Gestational Diabetes Mellitus among participants:

In the present study the prevalence of Gestational diabetes mellitus was found to be 10.4%. Almost similar results were reported in the other studies like in a study conducted in Chennai, [2] the prevalence was reported to be 16.55%. In a study conducted in rural community of Haryana, the overall prevalence of gestational diabetes mellitus was 15%.[6] In a study conducted by Reddy et. al[9], in rural area reported as low as 1.83% of gestational diabetes mellitus prevalence. The variation could be because rural life style. In a study conducted in Limbe, Cameroon[10], the prevalence was 20.5%.

Conclusion: The prevalence of Gestational diabetes mellitus is relatively high and so proper screening and control measures should be implemented to reduce the occurrence.

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