

ORIGINAL RESEARCH

Prevalence of Gestational Diabetes Mellitus and Its Risk Factors: A Study in A Semi Urban Area

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ABSTRACT

Introduction: Gestational diabetes is the state of glucose intolerance recognized during pregnancy. We have tried to establish the prevalence and risk factors for gestational diabetes in our area.

Material and methods: 3,847 pregnant ladies were screened for sugar levels after noting the demographic details, obstetric history, familial and previous history of diabetes. Patients with abnormal sugar levels were subjected to oral glucose tolerance test to confirm diabetes.

Results: 482 patients were confirmed with diabetes showing a prevalence of 12.5% in our geographical area. Increase in age showed a higher significance in prevalence of diabetes with 29% of patients than with non GDM (5.9%). 44.9% patients had a BMI between 25-29 years while 7.9 % of the patients were obese.

Conclusion: There was no significant association between familial history and hypertension and GDM among the patient. Increased birth weight of the infants seems to be one of the main complications of GDM. Increased age in pregnancy and increased BMI and obesity seem to be the most common risk factors in our area with increased birth weight being the major complication in infants. It is therefore important to identify the condition in an early age

Keywords: Gestational diabetes mellitus, body mass index, risk factors, obesity

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INTRODUCTION

Gestational diabetes mellitus (GDM) is a state of glucose intolerance which first is recognized during pregnancy.¹ A small proportion of women lack the necessary B cell reserve to maintain the normal glucose levels after 30-60 mins of a meal during pregnancy, leading to glucose intolerance in pregnant women.^{2,3} The impaired glucose tolerance may vary in severity but even mild degrees are accompanied by disturbances like abnormalities of glycerol, and nonsterified fatty acid metabolism.¹⁻⁴ Most of these women who become glucose tolerant post delivery, continue to have B cell dysfunction despite normal insulin sensitivity. This makes them susceptible to Type 2 diabetes in future.¹⁻³ The prevalence of Gestational diabetes is increasing world wide, probably due to urbanization, sedentary lifestyle, less physical activities and dietary changes and increasing prevalence of obesity.⁴⁻⁹ It is normally very difficult to predict the prevalence of GDM as due to enormous variations in the population and culture. Depending on the population studied and the diagnostic test employed, prevalence may range from 2.4 to 21 per cent of all pregnancies.⁷⁻⁹ It is estimated that overall, 7% of the pregnancies are complicated with gestational diabetes, with 200,000 cases occurring annually. The prevalence of GDM is reported as almost 14% of all pregnancies in the US, and has been increasing in multiethnic populations.⁵ In Korea, 2% to 5% of all pregnant women reportedly develop GDM.⁶⁻⁸ In India, since there is a wide differences in living conditions, socio-economic levels and dietary habits, the uniform pattern of GDM cannot estimated, but overall prevalence is estimated to be 16.55%.⁹ In Kashmir, the prevalence has been reported to be 3.8% in a study¹⁰ while in SouthIndia, GDM is found to be 9.9%, 13.8% and 17.8% among the rural, semi-urban and urban population respectively.¹¹

GDM poses a risk to mother and child. The major risk factors for the development of GDM include previous history of diabetes, maternal age, family history of pa-

tient, overweight, parity and high BMI.⁹ GDM gradually develops and is least pronounced during the first trimester with levels increasing with the age of gestation increases. There are two main complications of GDM on the baby, growth abnormalities and chemical imbalances. These infants are at a risk of being very large for their gestational age, sometimes even being more than 4kgs. Chemical imbalances in the fetus may interfere with maturation, causing the babies to be prone to respiratory diseases due to incomplete lung maturation and impaired surfactant synthesis.⁷ It is also found to be one of the significant causes of fetal morbidity and maternal metabolic complications including preeclampsia, polyhydramnios, fetal macrosomia, birth trauma, peroperative delivery, neonatal metabolic complications and perinatal death during pregnancy. It is therefore, very essential to be detected at an early stage so as to reduce its consequences.¹²⁻¹⁴

This study was performed to find the prevalence of Gestational Diabetes and its associated risk factors in our geographical area.

MATERIALS AND METHODS

The present study was conducted in the Department of Medicine, between May-2013 to April-2015 at Mallareddy Medical college for women. The study group included 3,847 pregnant ladies between the age 18 – 35 who came into the gynaecology OP. Details like age, weight, Body mass index (BMI), parity, medical history, previous history and familial history of diabetes, obstetric history were taken followed by complete physical examination, tests for glucose levels, complete blood picture, routine urine examination. All women who showed slightly abnormal levels of random blood glucose levels were further subjected to oral glucose tolerance test.

Oral glucose tolerance test (OGTT) was done after an overnight fast. 75g of pure glucose was mixed with 100ml of water and the patient was made to drink this mixture. 2ml of blood was collected in a sodium fluoride-oxalate bottle immediately. This was considered as 0 hour time. Blood samples were collected again at 1, 2 and 3 hours respectively. Plasma glucose levels were interpreted using NDDG criteria.

- Fasting blood glucose level ≥ 105 mg/dl
- 1 hour blood glucose level ≥ 190 mg/dl
- 2 hour blood glucose level ≥ 165 mg/dl
- 3 hour blood glucose level ≥ 145 mg/dl

Patients whose plasma glucose level met or exceeded any two values for glucose after the 75-g OGTT is considered positive for GDM.

RESULTS

During the study period a total of 3,847 pregnant women were included out of which, 482(12.5%) were diabetic (Figure: 1).

The mean age of all the patients was 28.6 +/- 4.1. Most of the patients belonged to the age group of 24-30(66.4% overall). But the significance was seen in age group of above 30 years where more number of patients had GDM than those without GDM (Fig : 2).

The gestational age for most of the patients with GDM was 25.4 weeks.

Of the GDM patients 32.6% had a family history of Diabetes. 85 % of the GDM patients in their 2nd and 3rd pregnancies had a history of GDM in the previous pregnancy.

The Body Mass Index for all the patients was calculated. Prevalence of GDM was seen among the patients with BMI between 18 and 29 (Fig: 3)

Hypertension was observed in 8.8% cases of GDM while 7.9% of patients without GDM were hypertensive. 67% of the women with GDM while 23% of the non GDM were obese.

The weight of the baby was >3.5kg in 251 cases (52%) while 189 had a birth weight between 2.5 – 3.5kg.

The baby weight was > 3.5kg in 151 (31.3%) cases of GDM patients while 89(18.5%) had a birth weight between 2.5-3.5kg. In 12(2.5%) cases the weight was <2.5kg (fig: 4).

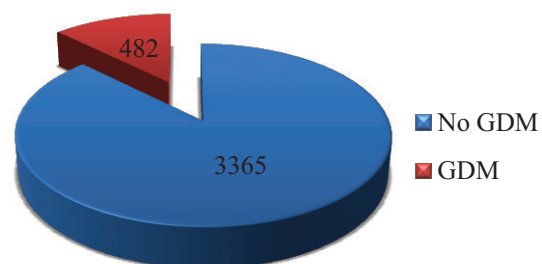


Figure-1: Prevalence of gdm

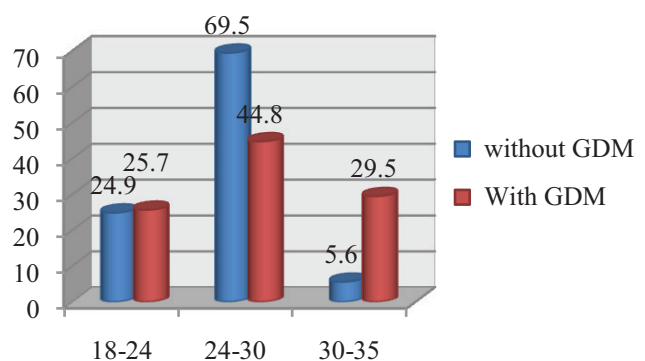


Figure-2: Age-wise incidence of GDM in percentage

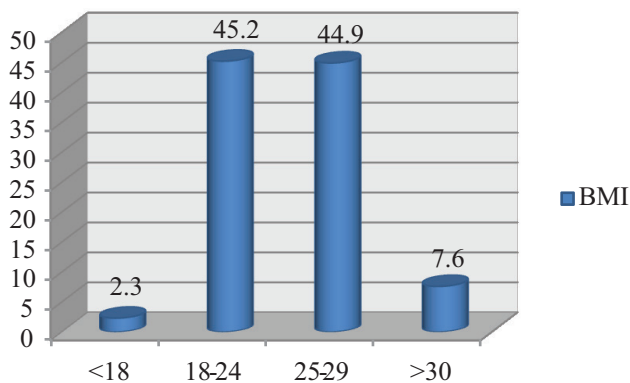


Figure-3: % of GDM patients in relation to BMI

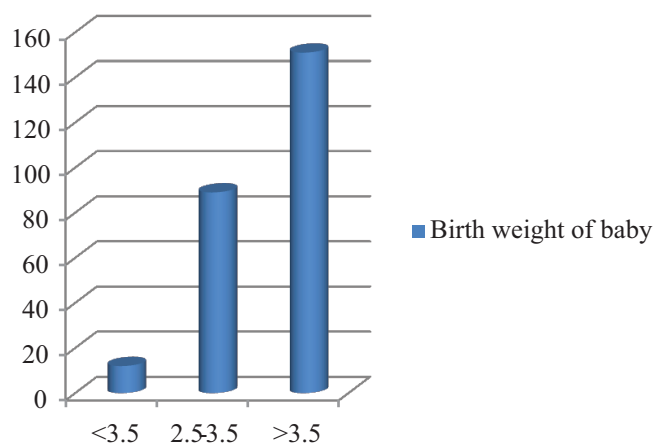


Figure-4: Birth weight of baby in GDM patients

DISCUSSION

Gestational Diabetes mellitus has been around for a number of years, but controversies remain regarding the screening test and diagnostic criteria. There is a wide variation with regard to the prevalence around the world. It 1982, it was reported to be around 2% but had steadily increased since and today had risen to approximately 17% throughout the world.¹⁵ But this data also seems to be differing in different geographical area, probably due to different socioeconomic levels, education, nutritional changes, lack of exercise etc.

Our study showed a prevalence of 14.1% in our area. In other studies performed in India, 6.7% was found in Jammu district, 15 % in Thiruvananthapuram, 12% in Bangalore, 12 % in Alwaye, 18.8% in other places in South India. An overall prevalence of 16.55% was reported.⁹⁻¹¹

In our study, the incidence of GDM increased with increase in age. In a similar study by Rajput et al incidence of women with GDM > 25 years of age were 3.8 times than a woman <25 yr of age.^{16,17} Seshiah et al¹¹ reported an odds ratio of 2.1 for women >25 yr of age. Similar results were observed by Sreekanthan et al.¹⁸ Crypryk et al had reported a prevalence of mean age of

women with GDM to be 30.1 while non GDM women were 27.2 of age.

Obesity is one of the important risk factors for Gestational Diabetes mellitus. Our study reported a significant association of GDM with the BMI and weight of the patients. Obese patients were more prone to GDM than leaner women. 97.7% of the women with GDM had a BMI of >18. Of them 44.9% were overweight with a BMI between 25-29. 7.6% of these women were obese. Only 2.3% of the patients had a BMI of <18. Similar results were observed by many other earlier studies.^{11,14,18} Sreekanthan et al¹⁷ found 45.2% of women with GDM to be overweight (BMI 26-30) and 9% of them to be obese (BMI 31-35). Rajput et al apart from reporting that higher BMI is associated with increased rate of GDM, they also observed that GDM women had a tendency to gain more weight during pregnancy than non GDM women.

Familial history of diabetes is also known to play an important role in women getting diabetes during pregnancy. We observed a family history in 32.6% of the GDM cases while it was observed in 28.2% of non GDM case. We could not establish any significance in the two. No significance was observed by Siribaddana et al in a similar study in Ceylon.²¹ But Crypryk et al reported a 40% of familial history in GDM patients while a family history was observed in 25.7% of non GDM cases.

In our study, we observed a greater prevalence of GDM in 2nd or 3rd parity rather than the first parity, probably because of increase in age. Similar results were observed by Crypryk et al in their study. This recurrence of GDM during consecutive pregnancies was probably due to ingnoring the condition in the earlier pregnancies and improper treatment and follow up¹⁷

The adverse effect of GDM seen in infants was the increased birth weight. More than 30% of the babies were born with increased birth weight. Similar results were observed by Sidibanna et al.²¹

CONCLUSION

Gestational diabetes is a condition on rise among the pregnant women but there is a wide variation in the prevalence in different geographical area due to their socio-economic status, nutrition, age, etc. Improper treatment and followup can lead to abnormalities in the infants and these women are more prone to the disease in future. Therefore, it is essential to identify this condition in early stages. For this, regular screening of the pregnant women during their visits must be done so

that proper treatment and maintenance can be started as soon as possible.

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