

GDM Monitoring in Second Trimester of Pregnancy by DIPSI Criteria

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ABSTRACT

High blood sugar (glucose) develops during pregnancy but the condition disappears after giving birth is known as gestational diabetes. The study aims to screen out the occurrence of GDM at 24th -28th week of pregnancy as the risk can be reduced if the condition is diagnosed early and well managed. This cross-sectional study was carried out in gynecology OPD of Janakpur Provisional Hospital. As recommended by Diabetes in Pregnancy Study Group of India (DIPSI) guidelines, a pregnant woman has to be given a 75g oral glucose load and at 2 hours a venous blood sample is collected for estimating plasma glucose. Among 386 sample studied, 30 (7.8%) were diagnosed as GDM, with the mean age of patient being 25.07 ± 4.8 years. Maximum percentage of gravida; 16% diagnosed with GDM were within the age group greater than 30 years. Advanced maternal age was associated with the risk of GDM. We suggest that the community health service center should provide more prenatal guidance to women with advanced age and/or high BMI who plan to conceive so that they can understand the potential risk factors of maternal and infant-related complications.

Key words: *DIPSI criteria; Gestational Diabetes Mellitus; Gravida*

INTRODUCTION

High blood sugar (glucose) develops during pregnancy but the condition disappears after giving birth is known as gestational diabetes. Gestational Diabetes Mellitus (GDM) is defined as Impaired Glucose Tolerance (IGT) with onset or first recognition during pregnancy. Undiagnosed or inadequately treated GDM can lead to significant maternal & fetal complications. Moreover, women with GDM and their off springs are at increased risk of developing type 2 diabetes later in life.¹

Gestational Diabetes Mellitus (GDM) is a worldwide phenomenon with almost 15% of women suffering from hyperglycemia during pregnancy.² Although the cause of GDM is not known, some theories have been proposed regarding its cause. The placenta supplies a growing fetus with nutrients and water, and also variety of hormones, is produced to maintain the pregnancy. Some of these hormones (estrogen, cortisol, and human placental lactogen) can have a blocking effect on insulin. This is called contra-insulin effect, which usually begins about 20 to 24 weeks into the pregnancy. As the placenta grows, more of these hormones are produced, and the risk of insulin resistance becomes greater. Normally, the pancreas is able to make additional insulin to overcome insulin resistance, but when the production of insulin is not enough to overcome the effect of the placental hormones, gestational diabetes results.³

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The Diabetes in Pregnancy Study Group of India (DIPSI) guidelines recommended; as a pregnant woman walks into the antenatal clinic in the fasting state, she has to be given a 75g oral glucose load and at 2 hours a venous blood sample is collected for estimating plasma glucose. This one step procedure of challenging women with 75 gm glucose and diagnosing GDM is simple, economical and feasible.⁴ Advantages of DIPSI procedures are: (1) Pregnant women need not be fasting state. (2) Causes least disturbance in a pregnant woman's routine activities and (3) Serves as both screening and diagnostic procedure.⁵

GDM can happen at any stage of pregnancy, but is more common in the second and third trimester.⁶ There is no international consensus regarding timing of screening method and the optimal cut-off points for diagnosis and intervention of GDM.⁷ 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.⁸ If found negative at this time, the screening test is to be performed again around 24th – 28th week and finally around 32nd – 34th week. Thus, the study aims to screen out the occurrence of GDM at second trimester of pregnancy as the risk can be reduced if the condition is diagnosed early and well managed.

MATERIALS AND METHODOLOGY

This cross-sectional study was carried out in gynecology OPD of Janakpur Provisional Hospital, from April 2023 till June 2024 after obtaining ethical approval from Research and institutional review committee (IRC) of NMC. 386 pregnant ladies attending gynecology OPD for ANC, having singleton pregnancy irrespective of age, and socioeconomic status were included while patients diagnosed with diabetes before pregnancy and multiple pregnancies were excluded from the study. A standardized questionnaire was used to collect details including demography, family history and the obstetric history. Consent was taken from all participants prior to participating in the study.

Single step testing using 75 g oral glucose after dissolving in approximately 300ml water & measuring plasma glucose 2 hours after ingestion was performed. The patient was instructed to intake the complete solution within 5 min. A plasma standardized glucometer was used to evaluate blood glucose 2 hours after the oral glucose load. If vomiting occurred within 30 min of oral glucose intake, the test was repeated the next day but if vomiting occurs after 30 minutes, the test was performed on the same day. The threshold plasma glucose level of ≥ 140 mg/dL (more than or equal to 140) is taken as cut off for diagnosis of GDM.¹ All collected data was analyzed statistically by using SPSS version 16 and the prevalence of GDM was determined.

RESULTS

Among 386 total sample studied, 356 (92.2%) subjects were found to have normal glucose level while 30 (7.8%) subjects had GDM. Prevalence of GDM is represented by a pie-chart.

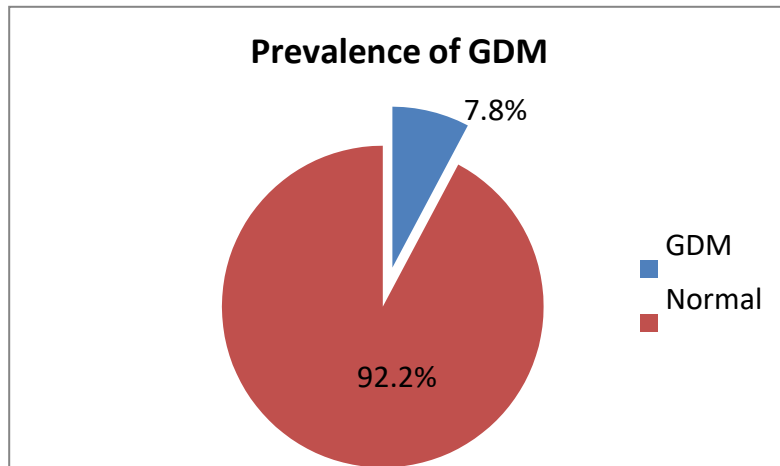


Figure 1: Prevalence of GDM

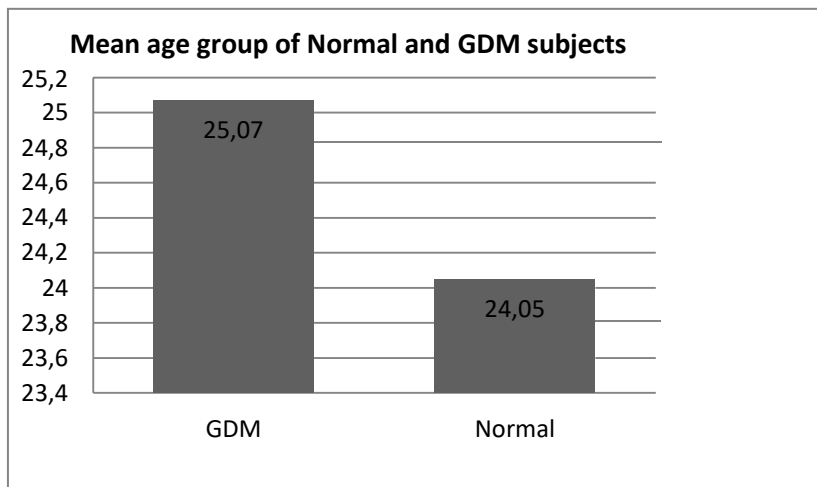


Figure 2: Mean age group of normal and GDM patient

The mean age group of GDM patient is higher; 25.07 ± 4.8 years in comparison to normal subjects 24.05 ± 4.1 years as shown in figure 2.

Table 1: Frequency table for age group

Age- group	Frequency	Percentage
<19	48	12.4
20-25	205	53.1
26-30	108	28.0
>30	25	6.5
Total	386	100.0

Out of 386 total pregnant ladies, minimum age was of 17 years to maximum of 37 years, mean age being 24 years. These samples were grouped into four divisions. Maximum pregnant ladies; 53.1% were of the age group 20-25 while only 6.5% were of age group greater than 30 years. (Table 1)

Table 2: Frequency of GDM in different age group

Age group	Frequency	GDM	Normal
<19	48	4(8.33%)	44
20-25	205	13(6.34%)	192
26-30	108	9(8.33%)	99
>30	25	4(16%)	21
Statistic: Pearson Chi-Square = 3.02, df = 3, p= 0.389			

Table 2 shows the frequency of GDM in different age group. Within the age group greater than 30 years, 16% had GDM. Age group less than 19 years and within 26-30 years manifested GDM in 8.33% while the subjects within the age group 20-25 years had GDM only in 6.34%. Prevalence of GDM was seen to be high in the age group greater than 30 years of age but it was not statistically significant ($p=0.389$).

DISCUSSION

Present study was conducted with the aims to screen out the occurrence of GDM at second trimester of pregnancy. Prevalence of GDM was found to be 7.8% which was similar to the study done by Thapa et al⁹ with 6.6% prevalence and Shrestha et al⁵ with 5.88% prevalence. But our finding was relatively lesser in comparison to study conducted by Riaz et al¹⁰, Srinivasan et al¹¹ and Seshiah et al¹² with the prevalence of GDM to be 11.8%, 17.4% and 17.9% respectively. Worldwide GDM prevalence as reported varies widely ranging from 1.4 to 14% and the prevalence is higher in Asian women than in European women.¹³ But in context of Nepal prevalence of GDM seems to be lesser in comparison to international platform may be because of involvement of Nepalese ladies in household chores providing them sufficient physical exercises.

GDM patients were older in compare to non-GDM subjects, with the mean age of two groups being 25.07 ± 4.8 years and 24.05 ± 4.1 years respectively. In current study prevalence of GDM was lowest showing 6.34% in the age group 20-25 while it was highest 16% for the age group greater than 30. Our finding is similar to Bibi et al¹⁴ who reported a mean age of women diagnosed with GDM to be 33 ± 2.8 years. Increasing maternal age may be one of the risk factor for GDM which has also been stated by number of other researches. Thapa et al⁹ stated that pregnant women with increased age were significantly at high risk of having GDM than those of younger women ($p=0.04$). Sun et al¹⁵ in China also observed the interaction between maternal age and risk of GDM (all p for interaction <0.001). Although Royal College of Gynecology and Obstetrics guidelines states that the gravid age less than 25 years is less prone to GDM, younger ages were not exempted from GDM in case of our study as the youngest subject of 18 years was also found to develop GDM.

CONCLUSION

Among 386 sample studied, 30 (7.8%) were diagnosed as GDM, with the mean age of patient being 25.07 ± 4.8 years. Maximum percentage of gravida; 16% diagnosed with GDM were within the age group greater than 30 years. Advanced maternal age was associated with the risk of GDM.

Awareness at community level regarding the right age to conceive, use of healthy food and physical activity to maintain normal weight so as to achieve better pregnancy outcomes will help in controlling the rising trend of GDM in pregnant women. Also, screening and early detection of GDM in all pregnant women and frequent monitoring is recommended for the prevention of various maternal and neonatal complications. We suggest that the community health service center should provide more prenatal guidance to women with advanced age and/or high BMI who plan to conceive so that they can understand the potential risk factors of maternal and infant-related complications.

Further large-scale studies are needed in order to have a clear perception of the occurrence of GDM in Nepal as our study is a single centric; it is recommended that our findings should be substantiated with more larger, multi-centric studies in the future.

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