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Original Research Article

Detection of gestational diabetes mellitus by repeat glucose tolerance test at 32-34 weeks in previously normoglycemic pregnancy

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Abstract

The traditional definition of GDM which is still used by ACOG[1] is any degree of glucose intolerance that either commences or is first diagnosed in pregnancy. Diabetes is the most common medical complication of pregnancy, women can be separated into those who were known to have diabetes before pregnancy-Pregestational or overt & those diagnosed during pregnancy-Gestational Diabetes. All Antenatal women attending op who are normoglycemic in second trimester are followed in third trimester at 32-34 weeks and repeat Glucose Tolerance Test is done and looked for any abnormal values so that new cases of gestational diabetes mellitus cases are found. Among the study population,15% of population had EFW >90th centile at 32-34 weeks gestation, In GDM mothers 40.9% had EFW >90th centile.

Keywords: Gestational diabetes mellitus, glucose tolerance test, normoglycemic pregnancy

Introduction

In nonpregnant individuals, the type of diabetes is based on its etiopathogenesis & pathophysiological manifestations. Type 1 Diabetes is characterized by absolute insulin deficiency. In contrast defective insulin secretion, insulin resistance or increased glucose production characterizes type 2 diabetes.

The traditional definition of GDM which is still used by ACOG [1] is any degree of glucose intolerance that either commences or is first diagnosed in pregnancy. Diabetes is the most common medical complication of pregnancy, women can be separated into those who were known to have diabetes before pregnancy-Pregestational or overt & those diagnosed during pregnancy-Gestational Diabetes [2].

The new IADPSG recommendations based primarily on the HAPO study have lowered the thresholds for making a diagnosis of GDM substantially. Previous guidelines were based upon levels of hyperglycemia known to be associated with the development of subsequent type 2 diabetes, whereas the HAPO study confirmed that adverse pregnancy outcomes occurred with increasing maternal glucose in a continuous association, even below the traditional cut-offs for a diagnosis of GDM [3].

Pedersen hypothesized that in maternal diabetes, high concentrations of glucose give rise to increased nutrient transfer to the fetus [4]. To prevent fetal hyperglycemia, fetal insulin secretion and fetal growth increase. This relation is supported by observations of gestational

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and pregestational diabetes that higher maternal glucose concentrations, particularly after a meal, predict greater infant birth weight. Conversely, maternal hypoglycemia also has been associated with an increased risk of fetal growth restriction. It seems reasonable that a relation between maternal glucose and fetal growth also should exist in women who do not have diabetes. A similar literature also suggests that nondiabetic gravidas with normal glucose concentrations are also associated with increased operative delivery as well as complications like unexplained IUD, preeclampsia, preterm delivery, chorioamnionitis, polyhydramnios, macrosomia, fetal hypoglycemia, hyperbilirubinemia, shoulder dystocia, respiratory distress [5, 6].

Methodology

Study design: Descriptive study.
Study setting: Department of Obstetrics & Gynecology.
Study period: One year from the date of ethics committee clearance.
Study population: All non-diabetic pregnant women satisfying the inclusion criteria coming for antenatal visits starting from the first trimester to term& delivering in our institution.
Inclusion criteria: All registered antenatal women who are non-diabetic attending the OPD from the first trimester & who have given consent to be a participant in the study.

Exclusion criteria

1. Antenatal women who are found to be GDM from second trimester 75gGTT.
2. Those referred to the department in the later periods of gestation.
3. Those who have not given consent for being a participant of the study.

Sample size

4pq/d^2 = 100

Study procedure

All Antenatal women attending op who are normoglycemic in second trimester are followed in third trimester at 32-34 weeks and repeat Glucose Tolerance Test is done and looked for any abnormal values so that new cases of gestational diabetes mellitus cases are found.

Study variables

1. Gestational Diabetes Mellitus-defined as carbohydrate intolerance of variable severity, with onset or first recognition during the present pregnancy.
2. 75gram Glucose Tolerance Test: The women attending antenatal clinic are given 75gram of glucose in 300ml of water irrespective of the last meal and blood sugar level monitored after two hours.
3. Values of regular blood sugar monitoring.

Data collection process

Total cases and controls will be interviewed regarding the risk factor variables by using the questionnaire, after taking informed consent from the study subjects.
Hospital records reviewed to obtain information regarding-medical conditions of the mother and baby.

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Data collection

A pre-tested semi structured questionnaire will be used to collect the data. This questionnaire is translated in Malayalam.
Hospital records also will be used as well to record the details of mother and baby.

Results

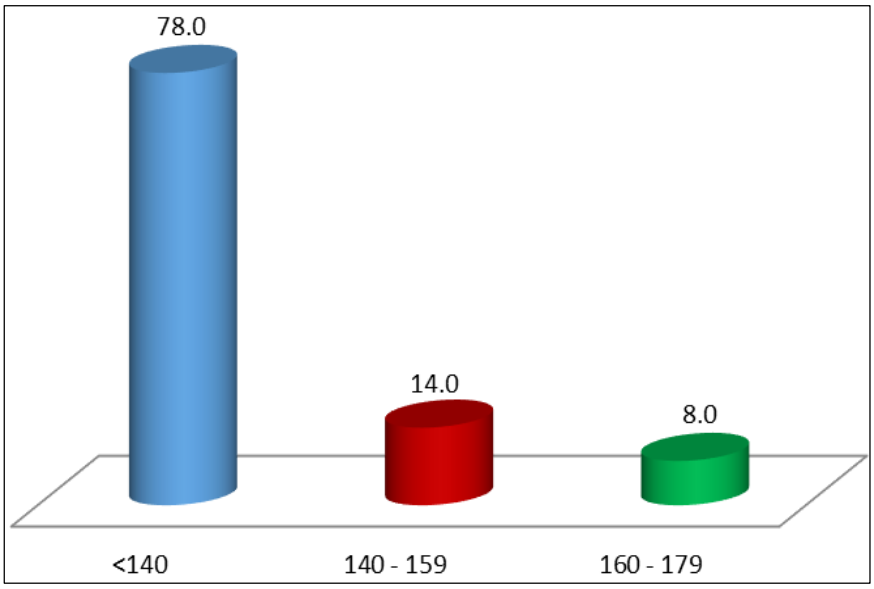

Fig 1: Comparison according to 75 Gram GTT

In my study 22% of the population had abnormal 75gram GTT values when it is repeated at 32-34 weeks of gestation.

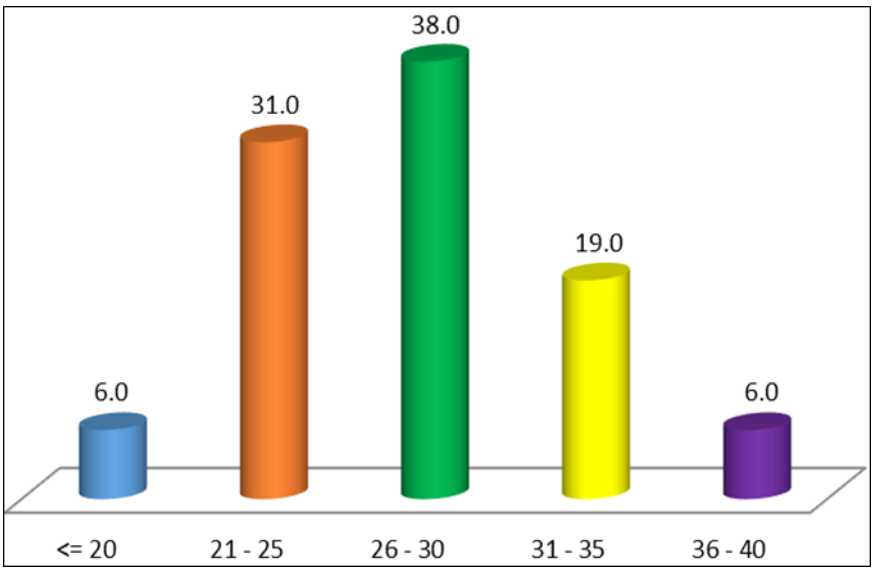

Fig 2: Percentage distribution of sample according to age

In my study, almost 75% cases with GDM belong to multigravida and 17% cases belong to primigravida.

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Table 1: Association of GDM With Obstetric Score-Parity

		Normal GTT	Normal GTT	Abnormal GTT	Abnormal GTT		
		Count	Percent	Count	Percent	X^2	p
Obstetric Score (Parity)	Primi	33	82.5	7	17.5	3.31	0.347
	Gravida 2	20	74.1	7	25.9		
	Gravida 3	11	64.7	6	35.3		
	> Gravida 4	14	87.5	2	12.5		

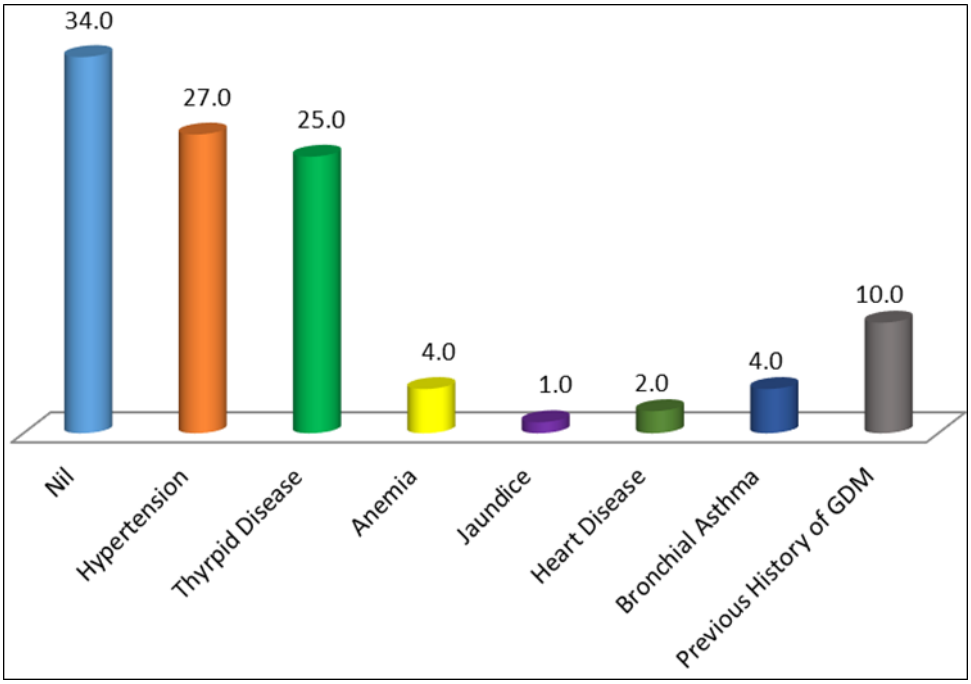

Fig 3: Percentage Distribution of Sample According to Past History

Table 2: Association of GDM with Estimated Fetal Weight

		Normal GTT	Normal GTT	Abnormal GTT	Abnormal GTT		
		Count	Percent	Count	Percent	X^2	P
EFW	<90TH Centile	72	92.3	13	59.1	14.85**	0.000
	>90TH Centile	6	7.7	9	40.9		

Among the study population, 15% of population had EFW >90th centile at 32-34weeks gestation, In GDM mothers 40.9% had EFW >90th centile.

Discussion

In the face of rising prevalence of diabetics, particularly in the women of child bearing age, the problem of GDM is growing, it is associated with increased maternal and perinatal outcome. My study is conducted in 100 antenatal women to diagnose new gestational diabetes mellitus cases by doing repeat 75gram GTT in 3rd trimester at (32-34wKs) in previously Normoglycemic females.

In my study, about 22% of the population had abnormal 75g GTT values (i.e.>140 mg/dl) when it is repeated at 32-34wks of gestation. Among them, 14% contributes to a value of 140-159mg/dl and 8% contribute to a value of 160-179mg/dl.

In the study by Rajesh Rajput, Yogesh Yadav and Meena Rajput prevalence rate of GDM is higher in women of age greater than 30 years (34.8%) and 11% in 26-30 years [7].

Among the total cases 95% belong to booked, 7% belong to Referral and there is no significant relation to referral status.

In the study conducted by Jang *et al*. showed 46.2% of overweight and obese women had GDM [8]. In my study, 27% of overweight and 35% obese patients had GDM.

Almost 52% in the study population with GDM had a positive family history. In a study by Rajput *et al*., 16.3% of women with GDM had positive family history of diabetes [7].

In my study, almost 75% of cases with GDM belong to multigravida and 17% cases contribute to primigravida. In a study conducted by Jang *et al*. 1998 and Di Clanni *et al*. 2003, found greater ratio of women with gestational DM in multigravida [9].

First most common complications According to my study, 60% of the patients with abnormal GTT at 32-34wKs had a previous H/O GDM. In a study by Spong cy *et al*., found 68% of the patients had recurrence of GDM, among them most of them required insulin and hospital admission [10]. From my study Past history of GDM is found to be the First most common complication.

In my study, 25% of patients had past history of GHTN. In a study conducted by Bener *et al*., women with GDM were at increased risk of developing GHTN (19%) and other study conducted by Binny *et al*., GHTN was seen among 12.8% patients [11]. From my study Second most common complication associated with GDM is GHTN.

According to my study EFW is greater than 90th centile in 40% patients with abnormal GTT. 59% babies delivered had weight 3-3.4Kg and 18% of babies had weight greater than 3.5Kg [8]. In a study conducted by Jang *et al*., found macrosomia in 9.3% with GDM Patients.

According to my study, hydramnios is seen in 68% of study population with abnormal GTT. In a study by Mathew M *et al*., 32% of pregnancies associated with hydramnios were complicated with diabetes [12].

According to my study, 54% of GDM patients underwent caesarean action. In a study conducted by Sermer M *et al*. showed 20% of untreated GDM patients underwent C/S and 33% of treated patients underwent CS [13].

In my study, 27% of babies with GDM mothers had neonatal complication, most of the babies presented with hypoglycemia. In a study conducted by Jensen DM *et al*., 24% of babies with GDM mothers had neonatal hypoglycemia and 46% has neonatal admission [14]. In my study, 9% of babies born to GDM mothers had neonatal admission.

Conclusion

Thus to conclude, all the antenatal women even with or without association of risk factors if exposed to 75gGTT in the third trimester many of the new GDM cases can be diagnosed so that adverse maternal and perinatal outcome due to GDM can be reduced.

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