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Research Article

**IMPORTANCE OF GLUCOSE CHALLENGE TEST FOR
DIAGNOSING GESTATIONAL DIABETES**Dr. Syeda Saliha¹, Dr. Shah Zaib Zahid¹, Dr Aqsa Akram²¹ Punjab Medical College Faisalabad² Gujranwala Medical College**Article Received:** March 2020**Accepted:** April 2020**Published:** May 2020**Abstract:**

Introduction: Gestational diabetes (GDM) is important for public health, in addition to its direct impact on mother and child. Pregnancy is a diabetic condition and is one of the main causes of the GDM type 2 diabetes epidemic. About 1% - 3% of pregnant women will show glucose intolerance. DMG is the most common metabolic complication that affects a pregnant woman. The frequency of GDM and associated maternal, prenatal and long-term morbidity highlights the importance of detection.

Aim: To investigate the role of the 50-g glucose challenge test in detecting gestational diabetes.

Place and Duration: In the Obstetrics and Gynecology department of Allied Hospital, Faisalabad for one year duration from January 2019 to January 2020.

Method: Two hundred and fifty prenatal patients between 24 and 28 weeks of gestation were tested for gestational diabetes using an oral glucose 50 g load test. Plasma glucose was found to be positive at 130 gm / dL or more, followed by glucose tolerance test (GTT 100 gm: 3 hours). Those with risk factors but negative GCT at 24-28 weeks were again screened at 32 -34 weeks. Normal patients and patients diagnosed with gestational diabetes were compared in terms of risk factors, clinical examination, special and routine tests, and pregnancy outcomes.

Results: out of 250 patients, 150 had no risk factors and 100 had one or more risk factors. 10 patients (4%) were diagnosed with gestational diabetes. Eight patients were identified from the group of risk factors after 24-28 weeks and 2 patients after 32-34 weeks.

Conclusion: Universal testing of all pregnant women for 24-28 weeks with glucose challenge test is a simple, useful, inexpensive and easy to organize tool for identifying women with GDM. In Pakistan, we recommend universal screening for all pregnant women, because there are 11 times the risk of glucose intolerance compared to white women during pregnancy.

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INTRODUCTION:

Pregnancy is a diabetic condition and occurs when beta cells are unable to adapt to the diabetic environment of pregnancy¹⁻². Diabetes during pregnancy is a consequence of serious consequences for the child and mother if early diagnosis and appropriate treatment are not carried out. About 1% - 3% of all pregnant women will show glucose intolerance³.

In Pakistan, we recommend universal screening for all pregnant women, because there are 11 times the risk of glucose intolerance compared to white women during pregnancy⁴. The largest number of these patients consists of people who have a genetic or metabolic predisposition to diabetes and cannot adequately compensate for the diabetogenic effects of pregnancy, i.e. patients with gestational diabetes. DMG is the most common metabolic complication that affects a pregnant woman. The frequency of GDM and associated maternal, prenatal and long-term morbidity highlights the importance of detection. Pregnant is at risk of being diabetic. May cause serious maternal complications such as hypoglycaemia, ketoacidosis, preeclampsia, uti, polyhydramnios, emotional stress and preterm labor, ketoacidosis, kidney disease and retinopathy⁵⁻⁶. The logic of using the glucose control test (GCT) to detect DMG is based on physiological changes during normal pregnancy. At the end of the first trimester, fasting maternal glucose fell by 10%. Diabetic stress related to pregnancy is diagnosed at the end of pregnancy and is diagnosed in the most nutritious condition⁷⁻⁸.

MATERIALS AND METHODS:

This study was held in the Obstetrics and Gynecology department of Allied Hospital, Faisalabad for one year duration from January 2019 to January 2020. All cases between 24 and 28 weeks of pregnancy were examined for the presence of DMG using a 50 g glucose challenge test (GCT). Selection criteria include clinical or past risk factors, neural tube defects, cardiac disorders, etc. In high-risk pregnancy, such as family history of diabetes in older pregnant women and first degree relatives, earlier large birth (birth weight > 4 kg), obscure obstetric history. The presence of congenital anomalies in the previous child, such as obesity, maternal age over 30 years, glycosuria, polyhydramnios, and early preeclampsia. Patients diagnosed with type I or type II diabetes, liver disorders, corticosteroids or insulin sensitizers, adrenal tumors or Cushing's disease were excluded. A plasma glucose level of 130 mg / dL (7.2 mmol / L) or higher was accepted as a positive GCT⁴ test. If GCT is negative, it was repeated after 32-34 weeks, especially in obese, elderly and at risk GDM women. GCT-positive patients received a 3-hour oral glucose tolerance test at 100 g (OGTT). GDM

was diagnosed when at least two plasma glucose values reached or exceeded the following values - (NDDG and ACOG criterion) Fasting - 105 mg / dl (5.9 mmol / l), 1 hour - 190 mg / dl (10, 6 mmol / L), 2 hours -165 mg / dl (9.2 mmol / L), 3 hours - 145 mg / dl (8.1 mmol / L). Plasma glucose test, glucose oxidase method - peroxidase. Data were compiled with a two-sided P-value <0.05 chi-square test and Fisher's full test and were considered significant.

RESULTS:

Positive GCT and OGTT were detected in 8 (3.2%) of the 250 patients examined after 24-28 weeks. Three of these 8 positive patients belonged to group I, i.e. the control group, and 5 belonged to group II, which had one or more risk factors. Ten of the 250 selected patients were diagnosed with gestational diabetes, seven of them had one or more risk factors, and three patients without risk factors had gestational diabetes using the above screening method. These 10 patients were examined and followed up to the pregnancy results. GCT of 250 examined patients had blood glucose values equal to or higher than 130 gm / dL with GCT, and these 8 patients were aged 24-28. Within weeks she had positive OGTT. 32-34 of 42 other patients with GCT positive but OGTT negative. Patients with at least one risk factor per week were re-examined, and two of them had GCT and OGTT positive in this pregnancy. So, the sensitivity and specificity of previous GCT data were 100% and 83%, respectively (since the number of false positive patients was 42). An additional study compared normal pregnancies with DMG pregnancy in terms of risk factors, pregnancy outcomes and neonatal morbidity. The maximum number of DMG cases occurred in the age group > 30 years. DMG was found to be much less common below the age of 25 (P <0.01). In the normal pregnancy group, the maximum number of patients was in the second gravida (30.62%), while in patients with positive gestational diabetes, the maximum number of patients was in the fourth gravida and large multigravida (30%) (p <0.001). The incidence of GDM was significantly lower between Primigravida and the second gravida (P <0.001). While the maximum number of diabetic pregnancies is over 50 kg (90%) in weight, the maximum number of patients in the non-diabetic group is between 40-59 kg, i.e. 63.75% (p <0.001). Family history was positive in the 10.42% normal pregnancy group, but 20% in the GDM group, the difference was quite significant (p <0.001). The incidence of preeclampsia, polyhydramnios, urinary tract infections, vaginal infections (candidiasis) in the normal pregnancy group was 10.63% and 2.08%. Although it was 6.67% and 7.9%, respectively, in the gestational diabetes group it was 20%, 10%, 20% and 30%, respectively, but the difference

between them was quite significant ($p < 0.001$). While one case (10%) of 10 diabetic patients was controlled only by diet modifications, nine patients (90%) were added to human insulin and the dose changed according to the degree of hyperglycemia. Premature delivery was observed in 25 patients, 23 of whom belonged to the normal pregnancy group and 2 belonged to the GDM group; this results in 9.5% and 20%, respectively, which is very important ($P < 0.001$). While the caesarean section

rate in the normal pregnancy group was 80% in the gestational diabetes group, it was 32.5%. The difference was quite significant ($p < 0.001$). Three of the 86 cesarean sections were made before 37 weeks of pregnancy, the cause was preeclampsia, fetal malformation and macrosomia. Vaginal delivery occurred in 162 patients (67.08%) in the control group compared to only 2 patients (20%) in the gestational diabetes group. This difference was very important.

Table 1: Shows the results of screening at 24-28 & 32-34 weeks of gestation

	TOTAL	GROUP I	GROUP II
NO. OF PATIENTS	250	150	100
GCT +VE, OGTT +VE (AT 24-28 WEEKS)	8	3	5
GCT +VE , OGTT +VE (AT 32-34 WEEKS)	2	0	2
GDM +VE PATIENTS	10	3	7

In the normal pregnancy group, the incidence of macrosomia was 3.33% compared to 20% in the diabetic pregnant group. This difference was very significant ($p < 0.001$). A child (5%) in the diabetes group had a large congenital malformation in the form of heart defects (ASD) and was premature. An increased incidence of hypoglycemia (30%) was found in 3 children of pregnant mothers with diabetes, and 1 of these 3 children was premature. In the normal pregnancy group, 3 children (1.25%) had hyper-bilirubinemia, while children born with gestational diabetes were present in 2 children (20%), the incidence was significantly high ($P < 0.01$). In the gestational diabetes group, two children had RDS (20%), and one of them was born before 37 weeks of gestation. The incidence of RDS in the normal pregnancy group was 3.75% (9 infants), of which 7 were premature.

Table 2: Showing the number of patients who were screened with GCT

Period of Gestation	GCT		OGTT	
	Positive	Negative	Positive	Negative
24-28 weeks	50	200	8	42
32-34 weeks	2	-	2	-

The difference in the incidence of RDS was significant in children born to normal mothers and pregnant diabetics ($p < 0.01$). The stress-free test, supported by the biophysical profile of the fetus, was used twice a week for antenatal supervision of the fetus in patients with GDM, and in patients with a result of 10 in the biophysical profile of the fetus, there was no perinatal mortality. While perinatal mortality was 6.67% in the normal pregnancy group, it was 10% in the gestational diabetes group. The difference between the two groups was significant ($p < 0.05$).

DISCUSSION:

Pregnancy is a diabetic disease, and GDM is important for public health, in addition to its direct impact on mother and child⁹. The incidence of GDM is high in Pakistan, and if early diagnosis and adequate treatment are not offered, gestational diabetes has serious consequences for the child and mother. In Pakistan, it is necessary to screen for all women who have been diagnosed with pregnancy, because the risk of glucose intolerance increases 11 times compared with white women during pregnancy. It is usually recommended to detect between 24 and 28 weeks. In this study, gestational

diabetes was detected in only 10 patients, the study included 250 patients, 150 patients did not have risk factors and was divided into group 1 or control group, 100 patients were among risk factors in one or more groups 2, age group over 30 years gestational diabetes. It was found that it was significantly related and was more significant at the age of over 35 and less at the age of 25. As with Abell (1976), it was associated with a higher pregnancy detection rate, indicating that the age is over 35 year's old¹⁰. The maximum incidence (30%) of gestational diabetes occurred between multiple pregnancies, which were statistically significantly

higher than in the normal life group and lower between primary and second pregnancies. Abdulbari bener et al. 2011 showed that the incidence of pre-eclampsia toxicity, polyhydramnios, urinary tract infections, vaginal infections (candidiasis) was higher during pregnancy than in normal pregnancy, and the difference was significant. He examined the results of pregnancy complicated by GDM and found that pregnant women with GDM have an increased risk of developing complications in mother and newborn¹¹⁻¹².

Caesarean section was found to be significantly higher in the DMG group compared to normal pregnancy. Caesarean section increased incidence of heart problems¹³⁻¹⁴. Infants of mothers with GDM have abnormalities, prematurity and hypoglycemia, and hyperbilirubinemia, which still cause preterm labor, macrosomia, asphyxiation, respiratory failure, hypoglycemia, hypocalcaemia, hyperbilirubinemia, and hyperglycaemia¹⁵. There are many risks associated with physiological, metabolic and congenital complications such as hypertrophic cardiomyopathy, especially congenital central anomaly. Perinatal mortality was found to be higher in pregnant neonates with diabetes; women with GDM and screening were found to have an increased risk of perinatal outcomes.

CONCLUSION:

Gestational diabetes has many complications in the mother and the fetus, therefore it is necessary to detect gestational diabetes. It's easy to organize all pregnant women for 24 to 28 weeks with a glucose test in a simple, convenient, affordable and outpatient setting.

Therefore, we can conclude that universal screening remains a good tool to identify women with GDM, at least as our population in Pakistan, where the incidence of diabetes is high and a large proportion of women are at medium or high risk. From DMG. Therefore, the detection, appropriate management and monitoring of women with GDM and their offspring can potentially prevent diabetes in two generations.

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