Original Article

Impact of Deranged Oral Glucose Tolerance Test (OGTT) on Perinatal Outcomes

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Abstract

Objective: To assess the frequency of adverse perinatal outcomes in patients with deranged Oral Glucose Tolerance Test (OGTT) results
Methodology: This study was conducted from 1st January 2021 to 1st January 2022 in the Outpatient Department (OPD) of our tertiary care hospital. One hundred and seventy-five pregnant women fulfilling the inclusion criteria of the study were selected from outpatient clinics. Demographic data of study participants were recorded on the devised proforma and based on OGTT results the participants were divided into two groups. Perinatal outcomes were compared between the groups. The distribution showed a normal reshaped curve hence paired sample student t-test was used to study the results. P value was calculated to assess the significance of the difference seen between groups.
Results: Among these 200 patients 140 had normal OGTT (group 1) results while 35 had deranged OGTT (group 2). Mean parity was 1.70 +/- 0.453, in group 1 and 1.80 +/- 0.406, Booking Body mass index (BMI) in group 1 was 1.85 +/- 0.641 while in group 2 was 2.28 +/- 0.621. BMI at the time of booking was statistically greater in women with the deranged OGTT group. Group 1 had a significantly lower incidence of previous GDM 1.57+/-0.502 in comparison to group 2 where the mean value was 1.95 +/- 0.2The mean gestational age at delivery was 38.5 +/- 1.02 in group 1 and 38.1 +/-0.993 in group 2. Neonatal birth weights varied significantly between groups with babies es with h greater mean birth weight of 2.1 +/- 0.663 in-group 2 and a lower mean neonatal weight of 1.9 +/- 0.467 in patients group 1.
Conclusion: Increased BMI is associated with deranged OGTT which in turn results in poor perinatal outcomes.
Keywords: OGTT, BMI, Perinatal outcomes, GDM.

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Introduction

Gestational Diabetes Mellitus (GDM) is one of the most common endocrinological disorders that affects pregnant women. Its prevalence varies according to the region due to the differences in methodological variations of its screening and diagnostic tests. Overall, its prevalence varies between 4-12%. Asia is among those regions which have the highest prevalence of GDM (11.5%).[1,2]

Various risk factors have been identified which include modifiable risk factors (increased dietary fat intake and reduced physical activity) and non-modifiable risk factors (advanced maternal age high body mass index [BMI], previous history of sudden intrauterine fetal deaths, personal or family history of GDM and history of macrosomia in previous pregnancies) A Several genetic factors related to GDM have been highlighted but there are limited genetic studies that have been done so far. [3,4]

GDM is known to affect maternal and neonatal outcomes. Hyperglycemia and Adverse Pregnancy Outcomes (HAPO) study has shown deteriorating pregnancy outcomes with increasing maternal glucose levels. There is an increased risk of pregnancy-induced hypertension (PIH), preterm pre-labor rupture of membranes (PPROM), preterm labor, instrumental deliveries, and postpartum hemorrhage in diabetic mothers.[3,5] intrauterine hyperglycemia has multiple adverse effects on fetus s and neonates which include macrosomia that might lead to shoulder dystocia and

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increased neonatal intensive care unit (NICU) admissions. Infants will have higher chances to develop childhood obesity and diabetes in adulthood. The rate of cesarean section is also higher in diabetic mothers.[3,5]

Various screening strategies to screen GDM are in practice but World Health Organization (WHO) has recommended screening by 75grams Oral Glucose Tolerance Test (OGTT) between 24-28 weeks of gestation.[6]

A lot of studies have been conducted on Caucasian women, but there is very limited data on south Asian women.[2,4,7,8] The maternal and fetal outcomes vary according to the diagnostic criteria being used. In the majority of hospitals in Pakistan, 75gm OGTT is being used aa s screening and diagnostic test for glucose intolerance. So this study has been conducted to assess the frequency of adverse feto-maternal outcomes in diabetic patients being screened by 75gram OGTT in our setup.

Methodology

This is a prospective observational cohort study involving pregnant women with GDM and pre-gestational obesity in antenatal clinics at tertiary care hospitals. It was conducted from January 2021 to January 2022. Pregnant women (aged ≥16 years) between 10 and 20 weeks gestation who had a BMI of 25 kg/m(2) or higher were recruited after informed consent. Demographic details, anthropometric measurement, glycemic control data, and obstetric, fetal, and neonatal outcomes were evaluated. The sample was divided into two groups according to OGTT results. Women with deranged glucose tolerance were assigned to receive metformin/insulin and perinatal outcomes were measured. The primary outcome a was Z score corresponding to the gestational age, parity, and sex-standardized birth weight percentile of live-borne born babies delivered at 28 weeks or more of gestation. Secondary outcomes included measures of maternal weight gain, maternal d, yet, and physical activity, interpregnancy-induced induced hypertension of preeclampsia, as well as the incidence of adverse neonatal outcomes were analyzed by modified intention to treat. Study data was uniformly distributed and a t-test was used to compare the two groups. P-value was calculated to evaluate the significance of the results.

Inclusion criteria: Women with a singleton, alive fetus between gestational age of 10^{+0}-20^{+0} weeks who are obese or overweight (defined as body mass index greater than or equal to 25 kg/m^2), at the first antenatal visit. Pregnant women with pre-existing diabetes were excluded.

Results

In this study, 175 patients were selected from OPD who came for routine antenatal visits. Demographic data were recorded including age, parity, and gestational age at booking, and the study wherefores divided into groups based on OGTT results. OGTT was applied to all 200 patients and then OGTT results were noted that patients required treatment what were the perinatal outcomes? Among 200 patients 140 had, normal OGTT (group 1) results while 35 had deranged OGTT (group 2). The mean parity was 1.70 ± 0.453, in group 1 and 1.80 ± 0.406, in group 2 however, this finding did not achieve statistical significance. (Table I)

Booking BMI in group 1 was 1.85 ± 0.641 while in group 2 was 2.28 ± 0.621 and this result was statistically significant P= .001. Therefore, BMI at the time of booking was statistically greater in women with deranged OGTT group.

The late first antenatal visit was recorded in group 2; booking visit mean gestational age 14.1± 5.38 weeks in group 2 and 13.1± 4.63 weeks in group 1 however this finding did not reach statistical significance. Similarly higher mean blood pressures were found at 1.89± 0.39 (group 1) than 1.85+/- 0.550 in (group 2), the results were however not statistically significant. Total maternal weight gain throughout pregnancy was almost the same in both groups.

Group 1 had a significantly lower incidence of previous GDM 1.57±0.502 in comparison to group 2 where the value was 1.95 ±0.218. The p-value was 0.000. Hence if a patient had GDM it was predictive of recurrence in successive pregnancies.

The mean gestational age at delivery was 38.5 ± 1.02 in group 1 and 38.11 ±0.993 in group 2 hence women with abnormal OGTT reports delivered at earlier gestational age and the results were statistically insignificant (P=.081). Data regarding the mode of delivery showed more chances of LSCS in patients with deranged OGTT and results were statistically significant. Complications during delivery and APGAR scores were almost similar in both groups however neonatal birth weights varied significantly between groups with babies with a greater mean birth weight of 2.1 ± 0.663 in group 2 and lower

mean neonatal weight of 1.93± 0.467 in patients in group 1. P value= 0.001 (statistically significant).

Table I: Demographic data of recorded Patients.

	OGTT result	N	Mean±SD	p-value
Parity	Normal	140	1.71±.453	.024
	Abnormal	35	1.80±.406	
BMI at booking	Normal	140	1.85±.641	.001
	Abnormal	35	2.28±.621	
gestational age at booking	Normal	140	13.17±4.630	.308
	Abnormal	35	14.14±5.385	
PIH, Preeclampsia	Normal	140	1.89±.392	.015
	Abnormal	35	1.85±.550	
liquor at term in cm	Normal	140	10.40±2.554	.009
	Abnormal	35	11.80±3.68	
Maternal weight gain	Normal	140	8.067±3.82	.123
	Abnormal	35	8.17±6.340	
GDM in a previous pregnancy	Normal	140	1.95±.218	.000
	Abnormal	35	1.57±.502	
Gestational age at delivery	Normal	140	38.55±1.027	.081
	Abnormal	35	38.11±.993	
mode of delivery	Normal	140	1.57±.668	.906
	Abnormal	35	1.85±.733	
complications during delivery	Normal	140	1.30±.879	.174
	Abnormal	35	1.22±.426	
weight at delivery	Normal	140	1.93±.467	.001
	Abnormal	35	2.17±.663	
APGAR SCORE at delivery	Normal	140	1.06±.246	.379
	Abnormal	35	1.08±.284	

Discussion

Gestational Diabetes Mellitus (GDM) known as diabetes mellitus in pregnancy, is diabetes diagnosed for the first time during pregnancy and it disappears after the birth of a baby.[10] Insulin resistance during this period is at its peak because of different placental hormones. Risk of developing GDM diagnosed by deranged OGTT increases in patients having risk factors like raised BMI, obesity, family history of diabetes, and previous obstetrical history of diabetes.[9,10]

In the study, [19,20] four ethnic groups were compared, this study shows diabetes either type II, Gestational, and raised BMI are independent risk factors for primary cesarean sections and preterm labor, this also shows after Hispanic ethnic group Asian women are more prone to develop diabetes (6.6%), which is less as compared to results in our study (17%).

Most of the patients in our study have a mean gestational age of delivery between 38-40wks which is comparable to a study conducted in Omani women,[15] however parity, gestational age about developing gestational diabetes doesn't show significant results in our study.

Our study shows a 17% prevalence of GDM which reflects prevalence in our Asian pregnant women, the same as found in the ethnic group California study [17,] comparable results as conducted in study [9], but comparatively high as compared to a study conducted in the Saudi pregnant population which was only 8.6%.[10]

Most studies found a significant relationship between diabetes and pregnancy-induced hypertension but there was no significant relation in our study, this may be due to a limited population.

A main contributing factor leading to GDM in our study was found to be raised BMI (p .001) at booking, these results are the same as compared to the study conducted, [18,20] having significant p-value 0.005 and ORs value.

In our study, neonatal outcomes such as respiratory distress syndrome, shoulder dystocia, and low Apgar score at birth in both groups remained the same showing no significant values, only neonatal outcome with a significant p-value (0.054) is low birth weight compared to study [10] but most of studies[12,13,14] show largely for gestational age babies.

Hence it showed that in gestational diabetes either untreated or treated, glycemic values should be controlled to improve both maternal and neonatal outcomes. This is a very alarming situation due to poor resources, lack of early referrals, poor screening, low IQ, and poor education. We, as a developing country and Asian ethnicity, need early screening, recognition, and treatment of gestational diabetes.

Conclusion

The findings underscore the critical role of ethical practice among clinicians in promoting the well-being of sexual assault survivors. Implementing and reinforcing ethical standards within clinical practice can significantly enhance the quality of care provided to survivors.

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