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To Determine the Maternal and Perinatal Outcomes in Gestational Diabetes Patients with Low Socioeconomic Status

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Abstract

Background: To determine the maternal and perinatal outcomes in gestational diabetes patients with low socioeconomic status.**Material and Methods:**The research comprised a total of 100 patients. Controls included 50 GDM patients who were handled and delivered, as well as 50 women with normal profiles who did not have GDM and delivered at the same time. GTT with 75 g glucose was used to diagnose GDM. If any of the values exceeded the criterion (fasting blood sugar [BS] ≥92 mg/dl, 1 h BS ≥180 mg/dl, and 2 h BS ≥153 mg/dl), the patient was diagnosed with GDM. All individuals had a Level II ultrasound (anomaly screen) at 18–20 weeks. Any prenatal problems, such as urinary tract infection (UTI), candidiasis, preeclampsia, polyhydramnios, and so on, were documented and treated. As part of the treatment, all individuals with GDM on insulin were induced at 38 weeks, whereas those on diet were induced at 40 weeks.**Results:**In both groups, there was no significant difference in age, BMI, or religion. However, there was a substantial difference in socioeconomic level, with a considerably greater proportion of women in the lower socioeconomic class in GDM 31(62%) compared to control 25(50%) (P=0.001). Gestational hypertension and preeclampsia were found in a considerably larger number of GDM patients (9(18%) compared to controls (3(6%)), but polyhydramnios was also detected in a higher number of GDM patients (2(4%)). The mean birth weight in the GDM group was 2974.22±545.11 compared to 2836.45±606.73 in the control group. There was no significant difference in Apgar scores between the two groups at 1 and 5 minutes.**Conclusion:**GDM has a greater frequency in India, which varies by region and socioeconomic position. Adequate GDM therapy with diet, oral hypoglycemic medications, or insulin to achieve euglycemia may result in near normal maternal and newborn outcomes. Despite the fact that birth weight and neonatal hypoglycemia are still increased in GDM patients.

Keywords: Gestational diabetes mellitus, oral glucose tolerance test, perinatal complication, prevalence.

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Introduction

Maternal glucose, metabolism changes gradually throughout pregnancy. Insulin resistance and diabetogenic stress caused by placental hormones demand a compensatory increase in insulin production as the pregnancy progresses. Gestational diabetes mellitus (GDM) occurs when this adjustment is insufficient. Indian women have a higher diabetes prevalence than white women, and their relative risk of acquiring GDM is 11.3 times higher.[1] A unified suggestion for the best technique to GDM screening and diagnosis is still unclear. Significant questions remain about the effects of GDM diagnosis on the pregnant woman and her family, the impact of diagnosis on obstetric interventions, and whether early detection and treatment

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of GDM will improve perinatal, neonatal, and maternal outcomes while also lowering overall health care costs.[2] Abnormal glucose tolerance during pregnancy is not only connected with pregnancy morbidity, but it also increases the mother's risk of developing diabetes later in life. As a result, GDM has ramifications beyond the index pregnancy, identifying two generations (the mother and her kids) at risk of diabetes in the future. Better identifying and treating at-risk moms and foetuses might have far-reaching consequences for maternal and child health.[3]

Socioeconomic status is a continuous and accurate predictor of health inequalities, since low-income groups have lower physical and mental health than their higher-income counterparts. Individuals with low socioeconomic status are also more prone to be stressed and to participate in risky behaviours such as smoking and alcohol/drug misuse. Furthermore, low-income populations are more likely to be overweight and less likely to engage in regular physical activity, all of which lead to poor health.[4] According to the World Health Organization, gestational diabetes mellitus (GDM) is a kind of glucose intolerance that develops or is discovered during pregnancy.[5] Due to the adoption of various diagnostic criteria, the prevalence rate ranges from 2% to 22% of all pregnancies.[6] It accounts for 90–95 percent of all diabetes cases observed in pregnant women.[7] There are several debates around the use of screening, diagnostic tools, and glucose level thresholds owing to the use of various criteria by different organisations.[6] Many studies describe maternal and foetal outcomes associated to GDM problems, however they are faulty owing to a number of confounding variables such as older maternal age, obesity, and a variety of other comorbidities.[8] Hyperglycemia offered the most solid evidence of unfavourable pregnancy outcome in gestational diabetes.[9] The tolerance test (GTT) was done in a trial with fasting ≥92 mg, 1 h ≥180 mg/dl, and 2 h ≥153 mg/dl plasma glucose concentrations as GDM.[10]

Materials and Methods

After receiving clearance from the protocol review committee and the institutional ethics committee, this prospective observational research was carried out at the Department of Medicine & Obstetrics & Gynaecology. The research comprised a total of 100 patients. Controls included 50 GDM patients who were handled and delivered, as well as 50 women with normal profiles who did not have GDM and delivered at the same time. Women's baseline characteristics such as age, body mass index (BMI), socioeconomic position, and religion were all recorded. GTT with 75 g glucose was used to diagnose GDM. If any of the values exceeded the criterion (fasting blood sugar [BS] ≥92 mg/dl, 1 h BS ≥180 mg/dl, and 2 h BS ≥153 mg/dl), the patient was diagnosed with GDM. Patients were first put on a diabetic diet and given some physical workouts. A nutritionist initiated the diet. If blood sugar levels were not managed with a diabetic diet, women were put on either an oral hypoglycemic medication or insulin in cooperation with an endocrinologist. The ladies got prenatal care on a regular basis. All prenatal examinations were completed. All of the women were screened for Down syndrome using Level I ultrasonography, a dual screen, and a triple screen. All individuals had a Level II ultrasound (anomaly screen) at 18–20 weeks. Any prenatal problems, such as urinary tract infection (UTI), candidiasis, preeclampsia, polyhydramnios, and so on, were documented and treated. As part of the treatment, all individuals with GDM on insulin were induced at 38 weeks, whereas those on diet were induced at 40 weeks.

Results

The prevalence of GDM was 3.71 percent (50/1347), with 35 percent managed on diet, 9 percent requiring insulin, and 6 percent treated with an oral hypoglycemic medication. [Table 1] shows the baseline characteristics of diabetic women and their control. In both groups, there was no significant difference in age, BMI, or religion. However, there was a substantial

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difference in socioeconomic level, with a considerably greater proportion of women in the lower socioeconomic class in GDM 31(62%) compared to control 25(50%) (P=0.001). A considerably larger proportion of GDM patients (15%) had a family history of diabetes than the control group (6%) (P=0.001). [Table 2] depicts the various maternal problems of two groups. Gestational hypertension and preeclampsia (pregnancy-induced hypertension) were found in a considerably larger number of GDM patients (9(18%) compared to controls (3(6%)), but polyhydramnios was also detected in a higher number of GDM patients (2(4%)). Other prenatal problems, such as UTI (6%) and candidiasis (3%) were more common in GDM patients as compared to non-GDM individuals. [Table 3] shows the obstetric result in two groups.

Preterm birth was more common in GDM patients (48% vs. 3% in the control group) (6 percent). The manner of delivery did not vary significantly between the two groups. Postpartum haemorrhage and postpartum complications were likewise comparable across the two groups. [Table 4] compares the perinatal outcome and newborn complications in the two groups. The mean birth weight in the GDM group was 2974.22±545.11 compared to 2836.45±606.73 in the control group. There was no significant difference in Apgar scores between the two groups at 1 and 5 minutes. There were considerably more large-for-date newborns in the GDM group than in the control group.

Table 1: demographic profile of the patients

Age	**GDM (50)**	**NON GDM (50)**	**P**
Below 25 years	5(10%)	6(12%)	0.77
25-35 years	30(60%)	35(70%)	
35-45 years	9(18%)	7(14%)	
Above 45 years	6(12%)	2(4%)	
Socioeconomic status			
Lower class	31(62%)	25(50%)	0.001
Middle class	14(28%)	14(28%)	
Upper class	5(10%)	11(22%)	

Table 2: Maternal Complications in GDM and Non GDM Patients

Complication	**GDM**	**NON GDM**	**P**
Polyhydramnios	2(4%)	0	0.31
Vaginal candidiasis	3(6%)	2(4%)	0.33
UTI	6(12%)	4(8%)	0.37
Gestationalhypertension/preeclampsia	9(18%)	3(6%)	0.022

Table 3: Maternal Outcomes

	GDM=50	**NONGDM =50**	**P (T- TEST)**
Vaginal	35(70%)	19(38%)	0.41
Caesarean	15(30%)	31(62%)	
Instrumental	2(4%)	3(6%)	0.32
Primary postpartum haemorrhage	1(2%)	1(2%)	0.66
Postpartum sepsis	2(4%)	1(2%)	0.49

Table 4: Perinatal Outcomes

	GDM =50	**NONGDM=50**	**P**
Baby weight	2974.22±545.11	2836.45±606.73	0.05

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Apgar 1 min	8.53±2.63	8.45±0.66	0.57
Apgar 5 min	8.91±2.12	8.71±0.33	0.42
Distribution of baby weight with reference to standard weight (%)			
AFD	35(70)	40(80%)	0.003
LFD	13(26%)	9(18%)	0.003
SFD	2(4)	1(2%)	
Hypoglycemia (%)	11(22%)	5(10%)	0.001
Hyperbilirubinemia (%)	2(4%)	2(4%)	0.46
Respiratory distress syndrome (%)	2(4%)	1(2%)	0.059
Congenital anomaly (%)	3(6 %)	1(2%)	0.062

Discussion

The frequency of GDM has been reported to range from 1.4 to 14 percent globally, with differences across racial and ethnic groupings. The HAPO study, on the other hand, confirmed negative maternal and foetal outcomes with rising blood glucose levels in the form of large for date, caesarean delivery rate, and neonatal hypoglycemia as primary outcomes and preeclampsia, preterm delivery, shoulder dystocia, birth injury, hyperbilirubinemia, and intensive neonatal care as secondary outcomes. Maternal hyperglycemia influenced both main and secondary outcomes, and the frequency of complication was directly related to increasing blood glucose levels. 8 The majority of recommendations were produced with the outcomes of the HAPO research in mind, including Indian guidelines published by Seshiah et al,[11] In the current study, the incidence of GDM was found to be 3.71 percent, which was lower than the 13 percent reported by Nair et al,[12] from Kolkata, Bengaluru, and Pune, and similar to the 7.17 percent reported by Rajput et al,[13] from Rohtak, Haryana, and higher than the 3.8 percent reported by Zargar et al,[14] from Kashmir. However, according to Seshiah et al,[11] the prevalence of GDM in Tamil Nadu is quite high, with 17.8 percent in urban areas, 13.8 percent in semiurban areas, and 9.9 percent in rural areas. There was a significant difference in socioeconomic status in the current study, with a significantly higher number of women in the lower socioeconomic class in GDM 31(62 percent) as compared to control 25(50 percent) (P=0.001), but Rajput et al. observed a higher prevalence in the lower socioeconomic class.[13] A considerably larger proportion of GDM patients (15%) had a family history of diabetes than the control group (6%) (P=0.001). Nair et al. got similar findings.[12] Gestational hypertension and preeclampsia (pregnancy-induced hypertension) were found in a substantially larger number of 9 (18%) instances in GDM patients compared to controls 3 in the current research (6 percent). The findings are comparable to those of Nair et al.[12] There was no significant difference in method of delivery (caesarean delivery vs instrumental delivery) in GDM compared to controls in the current research, which was similarly found by the HAPO study and Nair et al.[9,12] In terms of perinatal outcome, the GDM group had a substantially greater mean birth weight (2974.22±545.11) than the control group (2836.45±606.73). There was no significant difference in Apgar scores between the two groups at 1 and 5 minutes. There were considerably more large-for-date newborns in the GDM group than in the control group. The findings were consistent with those of Nair et al.[12] and Djomhou et al.[5] from Cameroon, who found an increased incidence of macrosomia in their research. Other authors and a comprehensive analysis of WHO and International association of diabetes and pregnancy research group of India diagnostic criteria found that GDM patients had worse maternal and perinatal outcomes, particularly macrosomia and neonatal hypoglycemia, when compared to controls.[15-17] Sacks et al.[18] discovered 17.8 percent (9.3 percent –25.5 percent) prevalence of GDM with unfavourable perinatal outcome in a Californian research. Most et al.[19] from New York, USA, identified

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an unfavourable perinatal result in women diagnosed with GDM in early pregnancy, and the bad pregnancy outcome was evident despite early detection and care of GDM owing to the increased severity of the condition.[12,19] Balaji et al.[20] observed an incidence of 13.4 percent of GDM in pregnancy and a need for insulin in 9.7 percent in a study conducted in a diabetes care centre in Chennai, India, using Diabetes in Pregnancy Study Group of India criteria, which was similar to the need for insulin in 9(18 percent) in our study. According to Nair et al,[12] effective glycemic management in the prenatal period may greatly prevent most complications such as macrosomia, foetal distress, delivery injuries, and dystocia. We also found a very slight increase in parameters such as large for date babies, birth weight, and neonatal hypoglycemia in GDM patients, but most other parameters such as mode of delivery, neonate Apgar, and instrumental deliveries were comparable in the two groups due to adequate control of BSs with diet, insulin, and oral hypoglycemic agents. Kwik et al. reported a similar finding.[21] Similarly, in the current research, respiratory distress syndrome and hyperbilirubinemia were comparable to control values owing to good GDM management by maintaining euglycemia and administering maternal steroid for foetal pulmonary maturation in women at risk of preterm newborns.

Conclusion

GDM has a greater frequency in India, which varies by region and socioeconomic position. Adequate GDM therapy with diet, oral hypoglycemic medications, or insulin to achieve euglycemia may result in near normal maternal and newborn outcomes. Despite the fact that birth weight and neonatal hypoglycemia are still increased in GDM patients.

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