

Maternal and Perinatal Outcome in Women with Gestational Diabetes Mellitus: A One Year Cross Sectional Study at SKMCH, Muzaffarpur, Bihar

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Abstract

Background: Initial diagnoses of gestational diabetes include pregnancy-related glucose intolerance, which may have negative effects on the mother and the unborn child. Various maternal and perinatal outcomes linked to pregnancies complicated by gestational diabetes were the focus of the current investigation.

Methods: From November 2021 to October 2022, 296 women who had been given a gestational diabetes diagnosis in the Obstetrics and Gynecology department at SKMCH in Muzaffarpur, Bihar, participated in this cross-sectional study. The hospital database's patient medical records were used to extract maternal and perinatal data. Age, gestational age, parity, delivery method, BMI, infant birth weight, prenatal problems, and maternal and neonatal morbidity and death were all included in the data. All multiple-pregnant women who also showed breech in the delivery room were disqualified. In addition to the measurement of blood glucose levels and standard investigations, the estimation of platelet count and a kidney function test were carried out to assess the results for the mother and the foetus.

Results: Of the 296 women who were diagnosed with gestational diabetes, 194 (65.5%) were between the ages of 20 and 30 years, followed by 84 (28.4%) who were between the ages of 30 and 40. Despite early detection and treatment of gestational diabetes, there was a greater prevalence of pregnancy-induced hypertension in 36 cases (12.2%), caesarean sections in 174 cases (58.8%), labour induction in 116 cases (39.2%), macrosomia in 8 cases (2.7%), and premature delivery in 10 cases (3.4%). While there were 10 (3.4%) deaths, there were 86 (29.1%) perinatal morbidities. Common causes of perinatal morbidity included neonatal hypoglycemia in 98 (33.1%) cases, meconium aspiration syndrome in 24 (8.1%), hyperbilirubinemia in 38 (12.8%), and the need for neonatal unit hospitalisation in 74 (25%) cases. 6 (2%) and 4 (1.4%) neonatal and intrauterine fatalities, respectively, were reported.

Conclusion: In women with gestational diabetes, the prevalence of maternal and neonatal morbidity and mortality rose. During the 24 to 28 weeks of gestation, a 75 g oral glucose tolerance test was used to screen pregnant women for gestational diabetes. This helped with an earlier diagnosis and prompt care, which reduced problems. With the right gestational diabetes care, pregnancy outcomes may be enhanced.

Keywords: Maternal Outcome, Perinatal Outcomes, Gestational Diabetes.

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Introduction

Diabetes that was not overtly present before to gestation but was detected in the second or third trimester of pregnancy is known as gestational diabetes. Gestational diabetes may have negative effects on the mother and the foetus[1]. First detected during pregnancy, the glucose intolerance may go away during puberty. The prevalence of gestational diabetes varies from 1% to 14% depending on the population, screening procedures, and diagnostic criteria[2,3]. All of the pregnant women who have controlled blood sugar levels, body weight, food, and exercise typically have healthy babies. However, unfavourable perinatal effects during pregnancy, such as increased caesarean rates, macrosomia, shoulder dystocia, and delivery trauma, have been documented in some circumstances[4,5]. Pregnancy-related diabetes is seen in about 90% of cases; gestational diabetes[6].

Because of a number of factors, including older mothers, obesity, and a number of other comorbidities, maternal problems linked to gestational diabetes have been found to be inaccurate[7].

Evidence of the bad pregnancy result linked with gestational diabetes was presented by the HAPO trial (hyperglycemia and adverse pregnancy outcome)[8]. In order to diagnose gestational diabetes mellitus, values of plasma glucose at 1 and 2 hours of ≥ 180 and ≥ 153 mg/dl, respectively, and a 75 g oral glucose tolerance test with fasting of ≥ 92 mg were used[9,10]. Different maternal consequences of unbalanced glucose metabolism include pregnancy-induced hypertension, foetal growth limitation, increased surgical delivery, preterm labour, recurrent urinary tract infections (UTI), vulvitis, maternal morbidities, and polyhydramnios [11]. Fetal malformation comprised perinatal morbidities such as stillbirth, intrauterine

mortality, hypocalcemia, respiratory distress syndrome, newborn hypoglycemia, and neonatal problems (IUD). Long-term unfavourable maternal outcomes included the development of type 2 diabetes mellitus, cardiovascular disease, repeated pregnancy losses, and hypertension.

Glycemic management perceptually reduces the incidence of foetal abnormalities and perinatal problems in the second half of pregnancy. Studying maternal and perinatal outcomes in women with gestational diabetes was the goal of the current investigation.

Material and Methods

From November 2021 to October 2022, 296 women who had been diagnosed with gestational diabetes underwent this cross-sectional study at the Department of Obstetrics and Gynecology, Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar.

The hospital database's patient medical records were used to extract maternal and perinatal data. Age, gestational age, parity, delivery method, BMI, infant birth weight, prenatal problems, and maternal and neonatal morbidity and death were all included in the data. All multiple-pregnant women who also showed breech in the delivery room were disqualified. Along with the measurement of blood sugar and normal examinations, the estimation of platelet count and a kidney function test were carried out to assess the results for the mother and the foetus.

Patients with gestational diabetes were recommended to use medical nutrition therapy (MNT) and have their blood sugar checked every 12 to 14 days. Earlier hospitalisation revealed a diagnosis of maternal problems. Simple patients went through spontaneous labour. Maternal characteristics evaluated were parity,

maternal age at delivery, maternal problems, postpartum difficulties, prior obstetric history, and caesarean section indications. Anomalies were noted and newborn status was evaluated using Apgar ratings. We looked at the emergence of hypoglycemia, sepsis, hypocalcemia, NICU hospitalisation, respiratory distress, dystocia, and hyperbilirubinemia.

Results

The total of the 296 women who were diagnosed with gestational diabetes, 194 (65.5%), were between the ages of 20 and 30. This was followed by 84 (28.4%), who were between the ages of 30 and 40. Despite early detection and treatment of gestational diabetes, there was a greater prevalence of pregnancy-induced hypertension in 36 cases (12.2%), caesarean sections in 174 cases (58.8%),

labour induction in 116 cases (39.2%), macrosomia in 8 cases (2.7%), and premature delivery in 10 cases (3.4%). While there were 10 (3.4%) deaths, there were 86 (29.1%) perinatal morbidities. Common causes of perinatal morbidity included neonatal hypoglycemia in 98 (33.1%) cases, meconium aspiration syndrome in 24 (8.1%), hyperbilirubinemia in 38 (12.8%), and the need for neonatal unit hospitalisation in 74 (25%) cases. 6 (2%) and 4 (1.4%) neonatal and intrauterine fatalities, respectively, were reported. Table 1 displays the patients' age distribution. Table 2 displays the patient distribution based on obstetric problems. Distribution of patients during induction is shown in Table 3. The distribution of patients is shown in Table 4 based on the baby's birth weight. Table 5 lists the many types of prenatal morbidity.

Table 1: Age-wise distribution of patients (n=296)

Age (Years)	No. of cases	Percentage %
< 20	0	0%
21-30	194	65.5%
31-40	84	28.4%
>40	18	6.1%
Total	296	100%

Table 2: Distribution of patients based on obstetric complications

Complications	No. of cases	Percentage %
Pregnancy Induced Hypertension	36	12.2%
Cesarean section	174	58.8%
Lobour Induction	116	39.2%
Macrosomia	8	2.7%
Preterm Delivery	10	3.4%

Table 3: Patient's distribution based on period of induction

Induction period (weeks)	No. of cases	Percentage %
<36	12	4.1%
37-38	234	79.1%
39-40	50	16.8%
Total	296	100%

Table 4: Distribution based on baby birth weight

Birth weight (Kg)	No. of cases	Percentage %
<2	4	1.4%
2-3	164	55.4%
3-4	98	33.1%
>4	30	10.1%

Table 5: Perinatal morbidity Types

Type of Perinatal Morbidity	No. of cases	Percentage %
Neonatal hypoglycemia	98	33.1%
Meconium aspiration syndrome	24	8.1%
Hyperbilirubinemia	38	12.8%
Requirement of neonatal unit admission	74	25%

Discussion

Gestational diabetes is the most prevalent metabolic condition that makes pregnancy more difficult. Pregestational diabetes and gestational diabetes mellitus account for 90% and 3%, respectively, of all instances of pregnancy complications caused by diabetes. Zvinavashe's analysis indicates that the incidence is between 2 and 5%. [12] 296 GDM patients were included in our study. Gestational diabetes, whose physiognomies are similar to those of pregestational diabetes, is linked to a range of maternal and foetal problems, claim Jie Tang *et al.* [13]. Both the prenatal and neonatal outcomes of diabetes were adverse. Although there are discrepancies on the harmful effects of GDM based on various parameters in various research [14].

Contrarily, the HAPO study confirmed adverse outcomes for both the mother and the foetus with rising blood glucose levels in terms of the caesarean rate, primary outcomes like neonatal hypoglycemia, and secondary outcomes like preeclampsia, shoulder dystocia, preterm delivery, hyperbilirubinemia, birth injury, and intensive neonatal care. All primary and secondary outcomes were impacted by maternal hyperglycemia, and problems rose directly as blood glucose levels rose. [15]. Ages in the study group ranged from 28 to 40. At 24-28 weeks of gestation, a 75 gm OGTT was performed as a screening test [16]. The incidence of GDM identified in the current study was 5.72%, which is less than the 13% reported by Huangfang *et al.* [17] and comparable to the 7.17% reported by [18].

The treatment choices included foetal and maternal monitoring, medical nutrition

therapy (MNT), insulin therapy, and exercise for sugar control [19]. A different method of treatment is possible with metformin. [20] In the current study, diet and insulin were given to 64.92 % of the patients, MNT alone to 32.8%, and diet control, insulin, and Metformin to 3% of the patients. With a mean age of 27.79, the majority were between the ages of 25 and 29. Age is a risk factor for GDM, as evidenced by the fact that those over 30 had the highest incidence of the disease [21].

The majority of patients have previously experienced several pregnancies. A sizable proportion of the population had a history of GDM, PIH, miscarriage, neonatal fatalities, macrosomia, intrauterine deaths, family diabetes history, and congenital abnormalities. Fetal health and anomalies are checked by ultrasound, and Doppler testing is done as needed. To reduce the risk of stillbirth, preterm delivery, and foetal compromise, foetal surveillance should start at 28–32 weeks. [22] Doppler ultrasound was suggested as a clinical tool for foetal surveillance in the study when pregnant women were at risk for placental vascular disease. [23].

Around 38 weeks were used for labour induction, with 16.4% of patients who had issues including PIH and FGR inducing labour sooner. No patient was allowed to stay past their scheduled time. This is brought about by a rise in IUD use and stillbirths occurring after 38 weeks of pregnancy. 62.6 percent of patients in 148 women experienced the commencement of labour spontaneously, while 37.32 percent got an elective termination. [24] The baby was delivered vaginally in 41% of cases.

The percentage of Caesareans was 59%, with 22% being elective and 78% being necessary due to an emergency. Blood glucose levels were normal following delivery, however insulin was needed in seven cases [25].

In GDM, maternal morbidity increases. Post-operative wound infections were observed in 14 cases among the 158 LSCS patients. Macrosomia, hypertensive problems, large for gestational age (LGA) neonates, CS, and NICU admissions were all found to be much more common in pregnant women with GDM. These results provide credence to the idea that various maternal and newborn problems are more likely to occur in expectant mothers with GDM. There is strong evidence that intensive GDM treatment can minimise problems by a large amount[26].

Conclusion

In women with gestational diabetes, the prevalence of maternal and neonatal morbidity and mortality rose.

To screen for gestational diabetes, a 75 g oral glucose tolerance test was employed. This aids in an earlier diagnosis and prompt care, which reduces problems.

With the right gestational diabetes care, pregnancy outcomes may be enhanced.

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