

OUTCOME OF MATERNAL AND FETAL OUTCOME IN GESTATIONAL DIABETES
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ABSTRACT

Background: Diabetes mellitus, a disorder of carbohydrate metabolism, is characterized by elevated blood glucose levels due to defective insulin production, action, or both. According to WHO estimates, the highest number of diabetes cases globally. The number of people with diabetes was estimated at 31.7 million in 2000 and is projected to rise to 79.4 million by 2030. The National Urban Diabetes Survey (2001) reported a 5.4% prevalence of diabetes in individuals under 30 years old. The early onset of diabetes signifies that an increasing number of women with diabetes will become pregnant, posing significant management challenges for obstetricians. Both pregnancy and diabetes impact glucose metabolism, affecting both the mother and fetus. This study aims to compare maternal and fetal outcomes in pregnancies with gestational diabetes mellitus (GDM) versus non-diabetic pregnancies.

Materials & Methods: This prospective observational study was conducted over 12 months in the Department of Obstetrics and Gynecology. Pregnant women were screened for gestational diabetes mellitus and categorized into GDM and non-GDM groups. **Results:** The prevalence of GDM in the study population was 4.2%. Mothers with GDM had a higher incidence of complications, including hypertension, polyhydramnios, preterm labor, infection, shoulder dystocia, and postpartum hemorrhage, compared to those in non-diabetic pregnancies. Additionally, higher birth weights were observed in the GDM group.

KEYWORDS: Gestational Diabetes Mellitus, Pre-eclampsia, Preterm labor, Macrosomia.

INTRODUCTION

Gestational diabetes complicates 1-14% of pregnancies, varying based on population and diagnostic criteria. Pregnancy induces progressive alterations in maternal carbohydrate metabolism. As pregnancy progresses, insulin resistance and diabetogenic stress due to placental hormones require a compensatory increase in insulin secretion. Women have a high prevalence of diabetes and are 11.3 times more likely to develop gestational diabetes mellitus (GDM) compared to white women (Rajput et al., 2013).

There is no universal consensus on the ideal approach for screening and diagnosing GDM. Significant questions remain about the implications of a GDM diagnosis on the pregnant woman and her family, the impact on obstetric interventions, and whether early recognition and treatment of GDM improve perinatal, neonatal, and maternal outcomes, as well as overall healthcare costs (Swami et al., 2008).

Abnormal glucose tolerance during pregnancy is associated not only with pregnancy morbidity but also with an increased likelihood of subsequent diabetes in the mother. Thus, GDM has implications beyond the index pregnancy, identifying both the mother and her offspring as at risk for future diabetes. Better identification and treatment of at-risk mothers and fetuses may have significant implications for maternal and child health. This study aims to compare the maternal and fetal outcomes in pregnancies complicated by gestational diabetes mellitus with those in non-diabetic pregnancies (Barbour, 2014).

MATERIALS AND METHODS

This prospective observational study was conducted in the Department of Obstetrics and Gynecology over a period of 12 months.

All antenatally registered patients were screened for gestational diabetes mellitus (GDM). The study participants were divided into two groups: those with GDM and those without GDM. Participants with

documented evidence of diabetes mellitus prior to pregnancy, regardless of treatment status, were excluded from the study.

A detailed clinical history was recorded, and a thorough physical examination was conducted at the time of presentation, with specific emphasis on the risk factors for GDM. Symptoms of diabetes and associated complications were noted. Investigations included complete blood count, liver function tests, kidney function tests, serum electrolytes, funduscopy, urine routine microscopy, HbA1c, a congenital anomaly scan at 22 weeks, and a third trimester ultrasound.

All GDM patients were admitted at 37 weeks for safe delivery or earlier if they went into labor or developed complications. The neonatologist recorded the birth weight, APGAR score, admission to NICU, and any complications, including congenital malformations. After discharge, patients were followed up after six weeks to test fasting and postprandial blood sugars to check for persistent elevated glucose levels.

RESULTS

The demographic characteristics of the patients indicate that the majority were between 25-30 years old and were diagnosed with diabetes at a gestational age of over 20 weeks. Most participants were multigravidas, literate, residing in rural areas, and had a BMI between 18.5 and 24.

The patients' significant past histories, which could adversely impact the current pregnancy, included previous instances of anomalous babies, macrosomia, GDM, intrauterine fetal demise (IUID), and abortions.

The maternal outcomes differed between diabetic and non-diabetic pregnancies, with comparisons made regarding the incidence of hypertension, polyhydramnios, preterm labor, vaginal/urinary tract infections, IUID, shoulder dystocia, perineal injuries, postpartum hemorrhage (PPH), puerperal sepsis, and the mode of delivery.

Neonatal outcomes also varied between the two groups, assessed by birth weight, APGAR scores at 1 and 5 minutes, incidence of meconium-stained liquor, NICU admissions, respiratory distress syndrome (RDS), hypoglycemia, hypocalcemia, hyperbilirubinemia, meconium aspiration syndrome (MAS), polycythemia, and neonatal sepsis.

During the follow-up six weeks after delivery, differences in fasting and post-lunch blood sugar values were observed between diabetic and non-diabetic pregnancies.

DISCUSSION

The prevalence of gestational diabetes mellitus (GDM) varies significantly across different races and ethnic

groups, ranging from 1.4% to 14% globally. In this study, GDM was found in 4.2% of the total patients screened, compared to a reported 7.7% prevalence of carbohydrate intolerance in a study conducted at a tertiary hospital.

In this study, the majority of patients (56%) were between 26-30 years old, with 30% over 30 years old. A study in Jammu noted that women with normal OGTT were younger compared to those with GDM, who tended to be older. Here, 28% of patients were primigravida, while 72% were multigravida, aligning with Rajput *et al.*'s finding that higher parity is associated with a higher rate of GDM.

A positive family history was noted in 20% of patients, which is comparable to the 23.9% reported in a study conducted in the UK by Nanda *et al.* Polyhydramnios was found in 16% of our patients, consistent with Bhat *et al.*'s reported incidence of 14.7% in GDM patients versus 2.7% in controls.

Pre-eclampsia, a significant complication, was present in 18% of GDM patients in this study. This is lower than the 40% incidence reported by Saxena *et al.*, but aligns with Xiong *et al.*'s findings that mothers with GDM are at increased risk of pre-eclampsia. Post-operatively, 4% of patients experienced puerperal sepsis, indicative of delayed wound healing, which is more common in GDM patients compared to non-diabetics.

In this study, 78% of babies were born at term, and 22% were preterm, which aligns with findings by Mahalakshmi MM *et al.* in South India, where 77.5% of babies were term live births and 19% were preterm. Preterm births here were attributed to premature preterm rupture of membranes, preterm labor, and early induction in cases of severe pre-eclampsia.

The study found that 60% of GDM patients underwent Caesarean sections compared to 36% in the control group. In comparison, Kale *et al.* reported a 60% incidence of LSCS in GDM patients. Mothers with GDM were more likely to have caesarean sections due to macrosomia and obstructed labor, similar to findings by Emmanuel Odar *et al.*

Macrosomia was observed in 40% of the babies in this study, higher than the 28% incidence reported in other studies. The incidence of low birth weight (<2.5 kg) was 20%. Complications in neonates born to GDM mothers included macrosomia, impaired fetal growth, metabolic and electrolyte abnormalities, cardiovascular and CNS anomalies. Here, 8% of the babies had hypoglycemia and 2% had hypocalcemia, compared to 1.4% congenital anomalies reported by Shefali *et al.* and 10% by Saxena *et al.*

At six weeks follow-up, 16.2% of patients had diabetes, with 7 showing impaired fasting glucose levels and 10

with impaired glucose tolerance. According to Mahalakshmi MM *et al.*, half of the patients developed diabetes within five years and over 90% within ten years after delivery. The conversion rate to type 2 diabetes was as high as 50% among Latina women and other high-risk ethnic groups in studies by Buchanan *et al.*

The proportion of women with previous GDM receiving postpartum diabetes testing remains lower than desired, even in health care systems with high testing rates. This highlights the need for improved follow-up and testing protocols for women with a history of GDM.

CONCLUSION

GDM is a commonly occurring medical disorder in pregnancy. Women with a history of GDM as well as offspring exposed to maternal diabetes in utero should be a major area of focus for preventive medicine. Preventive measures against type 2 diabetes mellitus should start during intrauterine period and continue throughout life from early childhood.

In conclusion, a short-term intensive care gives a long term pay off in the primary prevention of impaired glucose tolerance, diabetes and obesity in the offspring, as preventive medicine starts before birth. The maternal health and fetal outcome depends upon the care by the committed team of diabetologists, obstetricians and neonatologists.

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