

A Study on Maternal and Perinatal Outcome in Gestational Diabetes Mellitus

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ABSTRACT

Background and Aim: Gestational diabetes is initially diagnosed as glucose intolerance in pregnancy which might result in adverse maternal and perinatal outcomes. The present study aimed at different maternal and perinatal outcomes associated with pregnancy complicated by gestational diabetes.

Methodology: This cross-sectional study was carried out on 148 women diagnosed with gestational diabetes in the department of Diabetes and Endocrinology and Obstetrics/ Gynecology, Hayatabad Medical Complex, Peshawar and Mian Rashid Hussain Shaheed Memorial Hospital Pabbi respectively for duration of six months from April 2021 to September 2021. Maternal and perinatal data were taken from patients' medical records in the hospital database. The data included age, gestational age, parity, mode of delivery, BMI, infant birth weight, antenatal complications and both maternal and neonatal morbidity and mortality. All the women with multiple pregnancies and who presented with the breech in the labor room were excluded. Estimation of platelet count and renal function test were performed in order to evaluate the maternal and fetal outcomes in addition to estimation of blood glucose levels and routine investigations.

Results: Of the total 148 diagnosed with gestational diabetes, the majority of women 97 (65.5%) had an age between 20 and 30 years followed by 30 to 40 years 42 (28.4%). A higher incidence of pregnancy induced hypertension 18 (12.2%), cesarean section 87 (58.8%), labor induction 58 (39.2%), macrosomia in 4 (2.7%), and preterm delivery in 5 (3.4%) was reported despite early diagnosis and treatment of gestational diabetes. The prevalence of perinatal morbidity was 43 (29.1%) whereas the mortality was 5 (3.4%). Neonatal hypoglycemia in 49 (33.1%), meconium aspiration syndrome 12 (8.1%), hyperbilirubinemia 19 (12.8%), and requirement of neonatal unit admission 37 (25%) were common causes of perinatal morbidity. Neonatal and intrauterine deaths were reported in 3 (2%) and 2 (1.4%) respectively.

Conclusion: The prevalence of maternal and perinatal morbidity and mortality increased in women with gestational diabetes. A 75 g oral glucose tolerance test was used for screening of gestational diabetes in pregnant women during 24 to 28 weeks gestation which assisted in earlier diagnosis and timely intervention, in turn, reducing complications. Pregnancy outcomes might be improved with the proper management of gestational diabetes.

Keywords: Maternal outcome, Perinatal outcomes, Gestational diabetes

INTRODUCTION

Gestational diabetes is defined as diabetes diagnosed in the second or third trimester of pregnancy that was not clearly overt diabetes prior to gestation. Gestational diabetes might result in adverse maternal and perinatal outcomes [1]. The glucose intolerance is diagnosed first time in pregnancy but may disappear in puerperium. Based on population, screening methods and criteria of diagnosis, incidence of gestational diabetes varies from 1% to 14% [2, 3]. All the women with controlled blood glucose levels, body weight, diet and exercise usually give birth to healthy infants. However, during pregnancy adverse effect on perinatal outcomes such as higher cesarean rates, macrosomia, shoulder dystocia and birth trauma were reported in certain cases [4, 5]. About 90% cases of diabetes seen in pregnancy are gestational diabetes [6]. Maternal complications associated with gestational diabetes were flawed due to various factors like aged maternity, obesity, and several other comorbidities [7].

Hyperglycemia and adverse pregnancy outcome (HAPO trial) provided evidence of gestational diabetes-

associated adverse pregnancy outcome [8]. Value of plasma glucose 1 h ≥ 180 mg/dl, and 2 h ≥ 153 mg/dl, and 75 g oral glucose tolerance test with fasting ≥ 92 mg were taken as gestational diabetes mellitus [9, 10]. Pregnancy induced hypertension, fetal growth restriction, increased operative delivery, preterm labor, recurrent urinary tract infections (UTI), vulvitis, maternal morbidities, and polyhydramnios were different maternal complications of imbalanced glucose metabolism [11]. Fetal malformation included neonatal complications and perinatal morbidities such as birth trauma, prematurity, hypocalcemia, respiratory distress syndrome, neonatal hypoglycemia, stillbirth, and intrauterine death (IUD). Type 2 diabetes mellitus development, cardiovascular disease, recurrent pregnancy losses and hypertension were included in long-term adverse maternal outcomes. Perinatal complications in latter half of pregnancy and fetal anomalies incidence reduces as a result of glycemic control perceptually. The aim of the current study was to study maternal and perinatal outcomes in women diagnosed with gestational diabetes.

METHODOLOGY

This cross-sectional study was carried out on 148 women diagnosed with gestational diabetes in the of Diabetes and Endocrinology and Obstetrics/ Gynecology, Hayatabad Medical Complex, Peshawar and Mian Rashid Hussain Shaheed Memorial Hospital, Pabbi respectively for duration of six months from April 2021 to September 2021. Maternal and perinatal data were taken from patients' medical records in the hospital database. The data included age, gestational age, parity, mode of delivery, BMI, infant birth weight, antenatal complications, and both maternal and neonatal morbidity and mortality. All the women with multiple pregnancies and who presented with the breech in the labor room were excluded. Estimation of platelet count and renal function test were performed in order to evaluate the maternal and fetal outcomes in addition to estimation of blood sugar and routine investigations.

Gestational diabetes patients were advised medical nutrition therapy (MNT) and check-up for blood glucose after 12-14 days. Maternal complications were diagnosed during earlier admission. Uncomplicated cases underwent spontaneous labor. Parity, maternal age during delivery, maternal complications, postpartum complications, previous obstetric history, and cesarean section indications were maternal variables analyzed. Apgar scores assessed newborn status and anomalies were observed. Hypoglycemia development, sepsis, hypocalcemia, NICU admission, respiratory distress, dystocia, and hyperbilirubinemia were examined.

RESULTS

Of the total 148 women diagnosed with gestational diabetes, the majority of women 97 (65.5%) had an age between 20 and 30 years followed by 30 to 40 years 42 (28.4%). A higher incidence of pregnancy induced hypertension 18 (12.2%), cesarean section 87 (58.8%), labor induction 58 (39.2%), macrosomia in 4 (2.7%), and preterm delivery in 5 (3.4%) was reported despite early diagnosis and treatment of gestational diabetes. The prevalence of perinatal morbidity was 43 (29.1%) whereas the mortality was 5 (3.4%). Neonatal hypoglycemia in 49 (33.1%), meconium aspiration syndrome 12 (8.1%), hyperbilirubinemia 19 (12.8%), and requirement of neonatal unit admission 37 (25%) were common causes of perinatal morbidity. Neonatal and intrauterine deaths were reported in 3 (2%) and 2 (1.4%) respectively. Age-wise distribution of patients are shown in Table-I. Distribution of patients based on obstetric complications are shown in Figure-1. Table-II show distribution of patients on induction period. Table-III represent distribution of patients based on infant's birth weight. Types of perinatal morbidity is shown in Figure-2.

Table 1: Age-wise distribution of patients (n=148)

Age (Years)	Frequency N	Percentage %
< 20	0	0
21-30	97	65.5
31-40	42	28.4
>40	9	6.1
Total	148	100

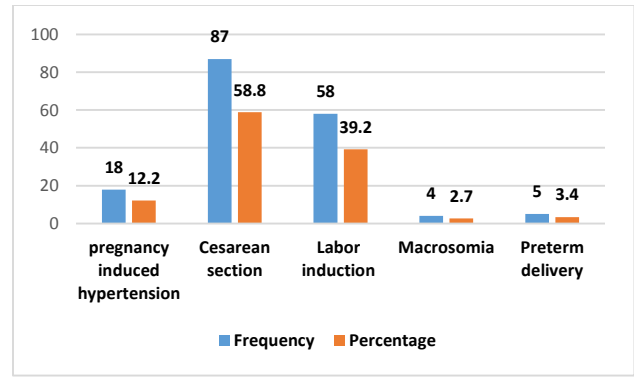


Figure 1: Distribution of patients based on obstetric complications

Table 2: Patient's distribution based on period of induction

Induction period (weeks)	Frequency	Percentage
<36	6	4.1
37-38	117	79.1
39-40	25	16.8
Total	148	100

Table 3: distribution based on baby birth weight

Birth weight (Kg)	Frequency	Percentage
<2	2	1.4
2-3	82	55.4
3-4	49	33.1
>4	15	10.1

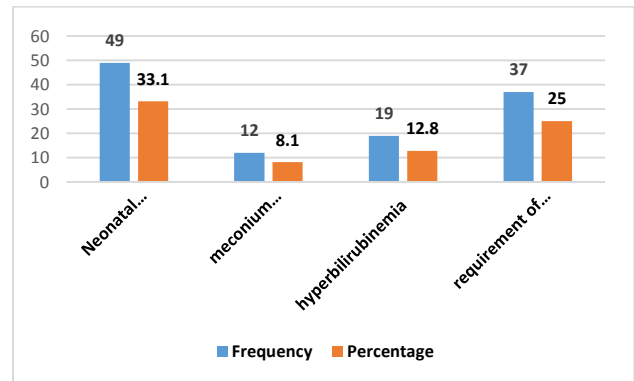


Figure 2: perinatal morbidity types

DISCUSSION

The most common metabolic disorder that complicates pregnancy is gestational diabetes. Diabetes complicates approximately 3-5 percent of all pregnancies with GDM accounting for 90 percent of the cases and pregestational diabetes accounting for the remainder. According to a study conducted by Zvinavashe, the incidence ranges between 2 and 5%. [12] Our study included 148 GDM patients. According to Jie Tang et al, gestational diabetes is associated with a number of maternal and fetal complications, the physiognomies resemble pregestational diabetes [13]. Diabetes had negative antenatal and neonatal outcomes. Though contradiction exist on GDM adverse effect based on different criteria in different studies [14].

The HAPO study, on the other hand, confirmed negative maternal and fetal outcomes with increasing

levels of blood glucose in terms of caesarean rate and primary outcomes like neonatal hypoglycemia and secondary outcomes such as preeclampsia, shoulder dystocia, preterm delivery, hyperbilirubinemia, birth injury, and intensive neonatal care. Maternal hyperglycemia affected all primary and secondary outcomes and complications directly increase with elevation of blood glucose levels. [15]. The study group ranged in age from 28 to 40 years. As a screening test 75 gm OGTT was conducted at 24-28 weeks of gestation [16]. The current study found a 5.72% incidence of GDM, which was below 13% reported by Huangfang et al.[17] and similar to the 7.17% reported by [18].

Medical nutrition therapy (MNT), insulin therapy, and exercise for sugar control, as well as fetal and maternal monitoring, were among the treatment options [19] Metformin can be used as an alternative therapy. [20] In current study, 64.92% of patients received diet and insulin, 32.8% received MNT alone and 3% required diet control, insulin, and Metformin. The majority were between the ages of 25 and 29, with a mean age of 27.79. The fact that the incidence of GDM was highest among people over the age of 30 indicates that age is a risk factor [21].

The majority of patients had multiple pregnancies previously. There was a significant number of people with GDM history, PIH, miscarriage, Neonatal deaths, macrosomia, Intrauterine deaths, family history of diabetes and congenital anomalies. Ultrasound scan is performed for fetal well being and fetal anomalies and Doppler is performed when specified. Fetal surveillance should begin at 28-32wks to prevent stillbirth, preterm delivery, and fetal compromise [22] In the study, Doppler ultrasound was recommended as a clinical tool for foetal surveillance where placental vascular disease risk exist in pregnant women. [23].

Labour induction was carried out around 38 weeks, with 16.4% of patients with complications induced earlier such as PIH and FGR. No patients were permitted to stay past their due date. This is due to an increase in IUDs and stillbirths after 38 weeks of gestation. In 148 women, 62.6% of patients experienced spontaneous labour onset, while 37.32% underwent elective termination. [24] In 41% of cases, the baby was delivered vaginally. The Caesarean rate was 59%, with 22% being elective C.S. and 78% being emergency C.S. After delivery, blood glucose levels were normal but in seven cases insulin was required [25]. Maternal morbidity is increased in GDM. Among the 79 LSCS patients, post-operative wound infections reported in 7 cases.

Pregnancy outcomes in women diagnosed with GDM revealed significantly higher rates of macrosomia, hypertensive disorders, large for gestational age (LGA) neonates, CS, and NICU admissions. These findings support the hypothesis that pregnant women with GDM have an increased risk of some maternal and neonatal complications. There is compelling evidence that aggressive GDM treatment can significantly reduce complications [26].

CONCLUSION

The prevalence of maternal and perinatal morbidity and mortality increased in women having gestational diabetes.

A 75 g oral glucose tolerance test was used for screening of gestational diabetes which assists in earlier diagnosis and timely intervention, in turn, reducing complications. Pregnancy outcomes might be improved with the proper management of gestational diabetes.

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