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Original Research Article

Gestational diabetes mellitus with its maternal and foetal outcome: a clinical study

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ABSTRACT

Background: Prevalence of the diabetes among pregnant women is increasing, attributable to advance maternal age, multi foetal gestation, increased body mass index, strong family history, sedentary life style, change in the diet, continued immigration. Gestational diabetes has few symptoms, commonly diagnosed by screening during pregnancy.
Methods: The present study was conducted at Department of Medicine and Department of Obstetrics and Gynaecology, Dr. S.N. Medical College, Jodhpur. Rajasthan, India.
Results: Out of 476 patients attending the antenatal outdoor at the Umaid Hospital, Jodhpur, Rajasthan, India. The prevalence of gestational diabetes in present study was 7.98%, Incidence of GDM found to increase with increasing age with maximum prevalence (10.71%) in more than 30 years age group, with increasing parity, low socioeconomic strata and in urban population. With maximum prevalence amongst higher parities (12.5%) in >G5 and higher). The incidence was higher with history of PIH (36.36%), family H/O DM (33.3%), GDM (12.12%), perinatal losses (15.15%), anomalous baby (9.09%), high BMI (67%). GDM complicate the normal course of pregnancy with increased incidence of PIH (36.4), Polyhydramnios (27.2%), infections like vaginal candidiasis (24.2%) and UTI (39.3%). The infant of diabetic mother had 12 (32.29%), 9 (26.47%), 11 (32.35%), 8 (23.53%) 5 (14.70%) and 3 (8.82%) of hypoglycemia, respiratory distress, macrosomia, congenital anomalies, birth injuries, polycythaemia, and hypocalcaemia respectively in diabetic mothers with suboptimal glycaemic control during pregnancy.
Conclusions: GDM continues to be an important obstetrical condition with significant feto-maternal morbidity. Complications in infant of diabetic mother are more common with those mothers who had poor glycaemic control.

Keywords: Foetal anomaly, Gestational diabetes mellitus, Glycaemic control

INTRODUCTION

Gestational Diabetes mellitus (GDM) is defined as pregnant women with any degree of carbohydrate intolerance, which is first recognized during pregnancy only. In October 1979, Dr. Norbert Freinkel (representing the American Diabetes Association) and Dr. John Josimovich (representing the American College of obstetricians and gynaecologists) met in Chicago at the First International Workshop Conference on Gestational Diabetes Mellitus. Between this conference and the re-classifications from the National diabetes data group, gestational diabetes as on official clinical entity was born. It is now defined as, "Carbohydrate intolerance of variable severity with onset or first recognition during the present pregnancy. The definition applies whether insulin

is used for treatment or the condition persists after pregnancy but does not exclude the possibility the glucose intolerance may have antedated the pregnancy."[1] The importance of GDM is that 2 generations are at risk of developing diabetes. Women with history of GDM are at increased risk of future diabetes, as are their children.

The pregnancy of diabetic woman carries significantly greater risk for spontaneous abortion, stillbirth, congenital Malformations and perinatal morbidity and mortality.

A foetal and neonatal Mortality rate was as high as 65% before the development of specialized maternal and neonatal care. Over the past three decades, Practitioners have sought to improve the outcome of diabetic pregnancies. So that, the results approach closes to those of non-diabetic Pregnancies.

METHODS

The present study was carried out at the Department of Obstetrics and Gynaecology and Department of Medicine, Umaid Hospital, Dr. S.N. Medical College, Jodhpur, in Rajasthan. 500 patients attending the antenatal check-up clinic were randomly screened for gestational diabetes mellitus.

Inclusion criteria

- Pregnant females with single viable foetus.

Exclusion criteria

- Diabetes diagnosed prior to pregnancy
- Pregnancy with more than one foetus
- Known major foetal anomaly
- Current or planned corticosteroid therapy
- Asthma requiring medication
- Current or planned beta adrenergic therapy
- Chronic medical illnesses like HIV/AIDS, Kidney disease of congenital heart disease
- Haematological or auto immune diseases such as sickle cells disease, other hemoglobinopathy, lupus or antiphospholipid syndrome.

A detailed history with special reference to previous obstetric outcome, history of abortions, stillbirths, IUDs, congenital malformation in foetus, preeclampsia, and history of GDM in previous pregnancy was taken.

History of medical disorders like hypothyroidism or treatment for infertility, PCOD was taken. Measurements of height, weight taken and BMI (weight in kg/ht. in m2) was taken.

Routine investigation like Haemoglobin, Blood urea, s VDRL, s HBsAg, urine complete examination and a basic Ultrasound was done. All patients screened were given to drink 75 gm Glucose dissolved in 200 ml of water. Their venous blood samples were taken after 2 hrs and. their plasma glucose levels were estimated by Glucose Oxidase Peroxidase (GOD-POD) method.

The criterion used was 75 gm oral 2 hours. GTT (as per DIPSI recommendation 2). All those patients who had 2 hours plasma glucose levels greater than 140 mg/dl were labelled as gestational diabetes mellitus (GDM).

All those patients found positive in the test were advised medical nutrition therapy (MNT). This included diet management therapy for 2 weeks. The patient was called for review after 2 weeks of diet therapy. At this visit a fasting and a 2 hours postprandial plasma glucose examination were done.

If the fasting plasma glucose levels were greater than 95 mg/dl and the 2hr. postprandial glucose levels were more than 120 mg/dl, she was advised Insulin therapy.

Foetal monitoring was done in admitted patients as well as a domiciliary basis by standard management guidelines.

Those patients who had foetal macrosomia (wt > = 4kg), CPD or any other risk factors were taken for elective LSCS while others were planned for vaginal deliveries. Emergency LSCS was taken for obstetric reasons.

New-borns of GDM mothers were evaluated by pediatrician, their Apgar score recorded and were closely observed for development of hypoglycemia, hyperbilirubinemia, asphyxia or any other complication and were managed as per standard treatment protocols.

RESULTS

Table 1: Prevalence of gestational diabetes mellitus in various age group.

Age (in years)	Non GDM patients (N=438)	GDM patients (N=38)	Percentage
<20	17	1	5.88 (n=17)
20-24	179	9	5.03 (n=179)
25-29	193	22	11.40 (n=193)
≥30	49	6	12.24 (n=49)

In present study, the incidence of GDM increased with increasing age and was highest in age ≥30 years (12.24%).

In present study, the highest incidence of GDM was found in low socioeconomic class (10.38%). The incidence of GDM in present study is higher in urban areas (10.85%) than rural areas (5.56%).

The incidence of GDM increases with increasing parity.

Table 2: Relationship of GDM with BMI.

BMI (kg/m^2)	Non GDM patients (N=438)	GDM patients (N=38)	Percentage
18.5-24.9	370	33	8.92c (n=370)
25-29.9	62	4	6.45 (n=62)
≥30	6	1	16.67 (n=6)

In the study, it was found that incidence of GDM more in maternal age group ≥30 it shows that incidence of GDM increases with increasing maternal age.

In present study, it was found that hypertension was more consistently related to GDM group (26.32%), than non GDM group (12.10%). Hypertension predisposes to GDM.

Table 3: Relationship of GDM with number of risk factors.

Risk factors	Non GDM patients (N=438)	Percentage (N=438)	GDM (N=38)	Percentage (N=38)
Maternal age ≥30	49	11.19	8	21.05
PIH	53	12.10	10	26.32
H/O DM in family	27	6.16	13	34.21
H/O Perinatal losses (SB, IUD)	32	7.31	6	15.79
H/O Abortion	29	6.62	6	15.79
H/O Anomalous baby (Congenital anomaly)	1	0.23	2	5.26
H/O Big baby	3	0.68	1	2.63
H/O Infertility treated	4	0.91	4	10.53
H/O GDM in pre-pregnancy	0	0.00	3	7.89
Over weight (BMI≥25)	68	15.53	22	57.89
Hypothyroid	0	0.00	2	5.26

In present study, history of perinatal losses was found in 15.79% of GDM group as against 7.31% in non GDM group. It suggests that these patients might have had an undiagnosed GDM in their previous pregnancies.

It was found that in present study, the history of previous delivery of an anomalous baby was found in 5.26% Versus 0.23% in GDM Versus non GDM group. This is an indicator that the patient might have suffered an undiagnosed GDM at that time. In present study, history of macrocosmic baby in GDM Versus non GDM group was 2.63% Versus 0.68% respectively.

It was found that association of Hypothyroidism was found in 5.26% Versus 0.00% in GDM. In this study incidence of GDM was more in obese person (BMI ≥25 kg/m2). It was found 57.89% in GDM than 15.53% in non GDM patient.

Table 4: Maternal complication of GDM during pregnancy.

	Non GDM patients (N=438)	Percentage	GDM (N=38)	Percentage
PIH	64	14.61	10	26.32
UTI	11	2.51	11	28.95
Vaginal candidiasis	23	5.25	6	15.79
Abruptio placenta	0	0.00	2	5.26
Eclampsia	0	0.00	1	2.63

In the present study, the incidence of UTI in GDM Versus non GDM group were 28.95% Versus 2.51%. The incidence of vaginal candidiasis was also higher in GDM than non GDM group, i.e. 15.79% Versus 5.25%.

The incidence of Abruptio placenta in GDM was 5.26%. The incidence of Eclampsia in GDM patients is 2.63% which is quite higher than non GDM patients.

In the present study, the incidence of wound sepsis in GDM versus non GDM group was 15.79% Versus 2.05%. In present study, the incidence of polyhydramnios in GDM group was 21.05% which was far higher than the 3.88% in non GDM group. In the present study, the incidence in GDM Versus non GDM group was 18.42% Versus 8.68%. In present study incidence of congenital anomalies in baby born to GDM mother (15.79%) is

higher than non GDM. In the present study, the rate of perinatal losses (due SB/IUD) was 9.09% Versus 0.42%. Neonates of GDM mothers suffer from perinatal asphyxia i.e. APGAR score (<7). In the present study, the incidence of low APGAR score in GDM Versus non GDM group was 18.42% Versus 3.20%).

Table 5: Perinatal complication in GDM.

	Non GDM patients (N=438)	Percentage	GDM (N=38)	Percentage
IUGR/IUD/SB	5	1.14	3	7.89
Hypoglycemia	23	5.25	7	18.42
Hyperbilirubinemia	13	2.97	5	13.16
Hypocalcemia	1	0.23	4	10.53
Polycythemia	1	0.23	4	10.53
NICU admission/birth asphyxia	54	12.33	12	31.58
Respiratory distress	1	0.23	27	60.23
Apgar score <7 at 1 Min.	14	3.20	7	18.42

In the present study, the incidence of hypoglycemia in GDM Versus non GDM group was 18.42% Versus 5.25% i.e. nearly 5 times. In this study, the neonatal hyperbilirubinemia rate in GDM Versus non GDM group was 13.16% Versus 2.97%. The incidence on NICU admissions in present study in GDM Versus non GDM group was 31.58% Versus 12.33%.

DISCUSSION

The following study was conducted on 476 patients attending the antenatal outdoor at the Umaid Hospital, Jodhpur. The prevalence of gestational diabetes in present study is 7.98%, and incidence increased with advancing age and was highest in age ≥30 years (12.24%). These finding were corresponding to those of Garashabi et al 2004 (10.5% were >30 yrs).[3] Hence showing high incidence of GDM in the >30 age group.

In present cohort, highest incidence of GDM was found in low socioeconomic class (10.38%). It is said that the foundation of adulthood metabolic disturbances is laid in childhood and adolescence. Poverty and low socioeconomic status are associated with faulty nutrition with more stress on saturated fats and refined sugars leads to adolescent obesity. This predisposes to maternal dysglycemia, GDM and even frank DM type 2 in the continuum

The incidence of GDM in present study is higher in urban areas (10.85%) than rural areas (5.56%). This might be due to stressful lifestyle and faulty nutritional habits of the urban patients. These results were also found by V. Seshiash et al who found the incidence in urban areas (17.8%) was nearly double in rural areas (9.9%).[4]

The incidence of GDM increases with increasing parity. Pregnancy is a diabetogenic stage which causes stress on the Beta cells to produce more insulin. With increasing number of pregnancies, the stress on Beta cells increase so does the insulin resistance, hence the incidence of GDM rises with parity. In the present study, the incidence of GDM was highs. (25%) in G5 and more group. However, the incidence in primi patients was higher 8.44% than 7.11% in G2-G4 group. Similar observations were made by Garshasbi et al (10.45% versus 4%), Hoseini et al, (30% Versus 9%) in multipara Versus primi respectively.[3,5]

In this study, the incidence of GDM increased with increase in BMI, and the highest incidence was found in the BMI ≥30 kg/m2 group i.e. 16.67% with increasing weight and the resultant BMI, there is increased insulin resistance and hence glucose intolerance. So, the incidence of GDM rises. These findings were communion with those of Garashasbi A et al.[3]

In present study, it was found that hypertension was more consistently related to GDM group (26.32%), than non GDM group (12.10%). Hypertension predisposes to GDM. These findings corresponded to those of Hosseini et al (14% Versus 3.55%), Gajjar et al (10%), Mindy Goldman et al, (7.3% Versus 3.3%), in GDM and non-group respectively.[5-7]

There is a genetic association of GDM with Diabetes mellitus. History of Diabetes mellitus in the family was also found to be a significant risk factor as 34.16% of GDM patients had a family history of DM, as opposed to only 6.16% of non GDM group. These findings were consistent to those of Garashasbi et al (18.6% Versus 15%), Bhat M et al (37% Versus 12%), and Das V et al (33.3%).[3,8,9] Gestational diabetes mellitus at times causes perinatal losses in the form of stillbirths or intrauterine deaths. Fetuses exposed to a hyperglycemic environment are more prone to asphyxia and acidosis. Besides, these loses usually occur at 36 weeks because the fetal demand of oxygen is the highest at this critical time. On the other hand, the placental function starts to deteriorate now. In present study, history of perinatal losses was found in

15.79% of GDM group as against 7.31% in non GDM group. It suggests that these patients might have had an undiagnosed GDM in their previous pregnancies. These findings were in conformity to those of Garshasbi et al (15.6%), Hosseini et al (12.3% Versus 8%), Das V et al (26.3%), and Dogra et al (24.19%), in GDM groups.[3,5,9,10]

Maternal hyperglycemia in the first trimester is found to cause congenital anomalies in the developing fetus. The abnormal glycosylation inhibitors, Somatomedin inhibitors, arachidonic acid deficiency is the cause. It was found that in present study, the history of previous delivery of an anomalous baby was found in 5.26% Versus 0.23% in GDM Versus non GDM group. This is an indicator that the patient might have suffered an undiagnosed GDM at that time. These findings were similar to those of M Bhat (6%) and Vinita Das et al (25%), in GDM group.[8,9]

GDM patients have been found to have increased chances of giving birth to a macrosomic baby. GDM causes hyperglycemia and resultant fetal hyperinsulinemia. Insulin being a potent growth factor, promotes lipogenesis, glycogen and protein synthesis, thereby causing fetal macroscopic. In present study, history of macrocosmic baby in GDM Versus non GDM group was 2.63% Versus 0.68% respectively. These findings were also found by Garashasbi A et al (4.7% 0.53%), Hosseini et al (35% Versus 6%, n of GDM=114). Bhat M et al (2.7 Versus 0.7%).[3,5,8]

In present study 10.53% of GDM patients had H/O treatment for infertility V/S 0.91% of non GDM group. These findings were in conformity to those of Bhat M et al (18.7% V/S 5.3%).[8] GDM has a tendency to recur. In present study history of GDM in previous pregnancy was found in 7.89% in GDM group. Garashasbi A et al found 53.8% in GDM group, Sponge CY et al (68%), the number is high probably because these study group was large, McNeil S (35.6%).[3,11,12]

Hypothyroidism causes excessive weight gain and metabolism disturbances that predispose to GDM. It was found that association of Hypothyroidism was found in 5.26% Versus 0.00% in GDM. In present study incidence of GDM was more in obese person (BMI $\geq$25 kg/m^2). It was found 57.89% in GDM than 15.53% in non GDM patient. Similar observations were made by Garashasbi A et al. (59.67%) of GDM had BMI$\geq$25 kg/m2.[3]

The GDM pregnancies were found to be complicated with pregnancy induced hypertension. In the present study, the incidence of PIH in GDM Versus non GDM group was 26.32% Versus 14.61%. The findings of others were Gajjar et al (60%). Abdulbari et al (19.1% Versus 10.4%), Odar E et al (16.7%) Crowther et al (17.9% Versus 11.8%).[6,13-15]

Hence antepartum morbidity in women with GDM is limited to an increased frequency of hypertensive disorders. The data are more convincing for an association with preeclampsia and more controversial for an association with PIH. Careful monitoring of blood pressure, weight gain and urinary protein excretion is recommended, particularly during the second half of gestation.

GDM causes an increased incidence of infections like UTI and Candidiasis. The increased blood glucose levels, glycosuria and reduced host defenses are the reasons. In the present study, the incidence of UTI in GDM Versus non GDM group were 28.95% Versus 2.51%. Similar findings were also found by M Bhat et al (36% Versus 10%), Abdulbari et al (24.4%).[8,13] The incidence of vaginal candidiasis was also higher in GDM than non GDM group, i.e. 15.79% Versus 5.25%.

The incidence of Abruptio placenta in GDM was 5.26%. Which was lower than that of Gajjar et al (20%).[6] The incidence of Eclampsia in GDM patients is 2.63% which is quite higher than non GDM patients.

In the GDM Versus non GDM group, the incidence of ND was (28.95% Versus 68.72%); Gajjar et al found 69.44% of spontaneous vaginal delivery rate and 19.44% Caesarean delivery rate in GDM group.[6] In the present study, the instrumental delivery rate in GDM Versus non GDM was 7.89% Versus 0.91%. In studies conducted by others the instrumental delivery rate in GDM patients was Gajjar et al (11.1%), Crowther et al (7.8%).[6,15] The deliveries of GDM patients are complicated than those of GDM due to the incidence of associated macrosomia and fetal distress, hence the incidence is higher. The LSCS rate in present study in GDM Versus non GDM group was 63.16% Versus 30.37%. Gajjar et al found an LSCS rate of 19.44%.[6] Our LSCS rate was higher probably because the incidence of macrosomia in present study (18.18%) was more.

The incidence of LSCS was higher than vaginal delivery in present study in GDM group as compared to other studies, because, in our setup there is lack of adequate intrapartum fetal monitoring and surveillance due to less infrastructure and greater patient load. Hence less number of high risk patients are given trial of labor and LSCS are taken at anticipation of complications, more frequently. Besides, most of the studies quoted were done in Western countries, where the female pelvis is larger than those of Indian women. So that even larger babies (>4 kg) are delivered vaginally, spontaneously or instrumental.

The indication of for caesarean section in diabetic pregnant female are (1) Elderly primi gravida (2) Multi gravida with a bad obstetric history (3) Diabetes with complications or difficult to control (4) Obstetric complications like pre-eclampsia poly hydroamnios mal-presentation (5) Fetal macrosomia (>4 kg) (6) Prolonged labor, obstructed labor due CPD. As such 50% of diabetic mother are delivered by caesarean section.

Postpartum hemorrhage (PPH) has a higher incidence in GDM patients. Over distended uterus with large babies, increased liquor and prolonged stage on labor are probable causes. Besides, cervical tears and vaginal lacerations also contribute. In the present study, the incidence of PPH in GDM Versus non GDM group was 13.16% Versus 12.79%. These findings were similar to those of Banerjee et al (9.09%) in GDM group.[16]

GDM increases the tendency to poor wound healing and wound sepsis, probably due to high blood glucose levels and reduced tissue healing power. In the present study, the incidence of wound sepsis in GDM versus non GDM group was 15.79% Versus 2.05%. Banerjee et al found a wound sepsis rate of 18.18% in GDM patients. Their study groups were larger, hence the difference.[16]

In present study, the incidence of polyhydramnios in GDM group was 21.05% which was far higher than the 3.88% in non GDM group. These findings were similar to those of Bhat M et al (68.7%) in GDM group.[8] Similarly GDM causes an increased incidence of fetal macrosomia. In the present study, the incidence in GDM Versus non GDM group was 18.42% Versus 8.68%. Similar observations were made by Seshiah V et al (9.9%), Bhat M et al (15.3% Versus 6%) Abdulbari et al (10.3% Versus 5.9%), Silva et al (10% Versus 5.3%).[4,8,13,17]

In present study incidence of continental anomalies in baby born to GDM mother (15.79%) is higher than non GDM. Congenital malformation (6-10%) is related to the severity of diabetes affecting organogenesis, in the first trimester (both in type 1 and type 2 diabetes). The factors associated with teratogenesis are multifactorial: (A) Genetic susceptibility (b) Hyperglycemia (c) Arachidonic acid deficiency (d) Ketone body excess (e) Somatomedin inhibition (f) Free oxygen radical excess (superoxide dismutase, an oxygen radical scavenging enzyme can protect excess malformation). Risks of fetal chromosomal abnormalities are not increased.

The perinatal complication rate in GDM group was higher than non GDM group. In the present study, the rate of perinatal losses (due SB/IUD) was 9.09% Versus 0.42%. Similar findings were made by Dogra et al (4.84% in GDM) and Odar E et al (16.7% Versus 3.3%).[10,14]

Neonates of GDM mothers suffer from perinatal asphyxia i.e. APGAR score (<7). In the present study, the incidence of low APGAR score in GDM Versus non GDM group was 18.42% Versus 3.20%). Similar observations were made by Gajjar et al (8.33% Versus 7.05%), Abdulbari Berner et al (9.7% Versus 8.4%), and Silva et al (25.4% Versus 21.4%).[6,13,17]

Fetuses of GDM mothers are exposed to maternal hyperglycemia and have resultant hyperinsulinemia and hence hypoglycemia. In the present study, the incidence of hypoglycemia in GDM Versus non GDM group was 18.42% Versus 5.25% i.e. nearly 5 times. Similar observations were made by Gajjar et al (5.55% in GDM group) and Hod M et al (5% Versus 0.9%).[6,18]

Hyperinsulinemia causes increased growth of fetus and polycythemia, followed by greater neonatal hyperbilirubinemia. In this study, the neonatal hyperbilirubinemia rate in GDM Versus non GDM group was 13.16% Versus 2.97%. These findings corresponded to those of Gajjar et al (11.1% in GDM), Silva et al (12.6% Versus 6.2%), Hod M et al (16.5% Versus 8.2%).[6,17,18]

Due to aforementioned complications GDM neonates have to be admitted to neonatal ICU. The incidence on NICU admissions in present study in GDM Versus non GDM group was 31.58% Versus 12.33%. These observations were in conformity to those of Gajjar et al (6.5%), and Crowther et al (16.5% Versus 3%).[6,15]

Among infants of diabetic mother's, the 3 (7.89%) baby's Birth Weight was < 2.5 Kgs, 30 (78.95 %) weighed between 2.5-4 Kgs and 5 (13.16%) babies had birth weight > 4 Kgs.

Foetal Macrosomia (30%-40%) Probably results from: (a) maternal hyperglycaemia → hypertrophy and hyperplasia of the foetal islets of Langerhans → increased secretion of foetal insulin → stimulates carbohydrate utilisation and accumulation of fat. Insulin like growth factors (IGF-I and II) are also involved in foetal growth and adiposity. With good diabetic control, incidence of macrosomia is markedly reduced. (b) Elevation of maternal free fatty acid (FFA) in diabetes leads to its increased transfer to the foetus → acceleration of triglyceride synthesis → adiposity.

In present study, congenital anomaly in infant of diabetic mother was found in six patients which was higher than non-diabetic mother. Among them, incidence of cardiovascular malformation (ASD, VERSUSD, PDA, Fallot tetralogy etc.) is more common 3 (7.89%), then CNS (microcephaly, anencephaly, Neural tube defect), 2 (5.26%) and GIT (TOF-Tracheo-oesophageal fistula etc.) 1 (2.63%). These complications are more common with Sub optimal maternal glycaemic control.

Good glycaemic control with pre-conceptional counselling can reduce the incidence of congenital malformation to 0.8-2%. Among the infant of diabetic mother's 5 (13.16%) babies were expired of whom two babies were IUD; all the babies who were expired their mother had Sub optimal maternal glycaemic control.

Fetal death has got multifactorial pathogenesis but the final event being hypoxia and lactic acidemia. It is observed more in patients with poor glycemic control, vasculopathy, pre-eclampsia, ketoacidosis and fetal macrosomia. Fetal hyperglycemia and hyperinsulinemia increase fetal oxygen demand. Glycosylated hemoglobin

carries less oxygen molecule. It binds O_2 more avidly and releases O_2 less. Other factors involved are fetal polycythemia, and hyper viscosity.

It is found that congenital anomalies and perinatal mortality rate is consistently higher with poor glycemic control. It is found that HbA1c level >6 have congenital anomaly (19.23%) and perinatal mortality (15.38%) is more than HbA1c level ≤6 have congenital anomaly (8.33%) and perinatal mortality (8.33%).

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