



**ORIGINAL RESEARCH PAPER**

**Obstetrics & Gynaecology**

**FETOMATERNAL OUTCOME IN WOMEN WITH GESTATIONAL DIABETES MELLITUS**

**KEY WORDS:** Antepartum complications, Caesarean section, Gestational diabetes mellitus, Macrosomia

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**ABSTRACT**

**Background:** The aim of this study was to assess the fetomaternal outcome in patients with gestational diabetes mellitus. **Methods:** This study was conducted in 2020 in Smt. NHL Municipal Medical College, Ahmedabad. 50 Patients with period of gestation more than 28 weeks with Gestational Diabetes Mellitus were included in study group and 50 nondiabetic patients with similar period of gestation were taken as controls. Risk factors and fetomaternal outcome were compared in the two groups. **Results:** Gestational diabetes was seen commonly in patients with >30 years of age, increased parity, positive family history and past poor obstetric history. Antepartum complications were seen more frequently in GDM group. Caesarean section rate was also high (74%) in diabetic group. Neonatal complications were seen more frequently in diabetic group. A significant percent (43%) patients developed overt diabetes over a one year follow up period. **Conclusions:** There was significant fetomaternal morbidity in patients with gestational diabetes mellitus. Hence, early detection and treatment would reduce the fetomaternal mortality and morbidity.

**INTRODUCTION**

Gestational diabetes mellitus (GDM) is defined as any degree of glucose intolerance with the onset or first time recognized during pregnancy with or without remission after the end of pregnancy [1]. GDM should be differentiated from pre-diagnosed type 1 or type 2 diabetes in women that get pregnant. Definition of GDM there for includes women whose glucose intolerance develop during pregnancy and who's that had pre-existing diabetes which had not been diagnosed before pregnancy. The distinction here is important as babies of women with pre-existing diabetes can be exposed to hyperglycaemia in the first two trimesters of pregnancy resulting in an increased risk of cardiovascular and other abnormalities (including central nervous system and musculoskeletal defects). To clarify the situations, the international association of diabetes and pregnancy study groups (IADPSG) recently recommended that high risk women found to have diabetes at their initial prenatal visit should be diagnosed as having pregestational diabetes mellitus or overt diabetes rather than GDM [2].

Diabetes mellitus is a chronic illness that requires continuing medical care and ongoing patient self-management education and support to prevent acute complications and to reduce the long-term complications. Diabetes care is complex and requires multifactorial risk reduction strategies beyond glycemic control.

Normal pregnancy is considered to be a diabetogenic state characterized by exaggerated amount of insulin release, associated with decreased sensitivity to insulin at cellular levels. The magnitude of GDM varies according to the country and the ethnic groups. The life style, educational status, family history of diabetes and other factors play an important role [3-7].

GDM is associated with increased incidence of fetomaternal morbidity as well as long term complications in both mother and babies. American College of Obstetricians and Gynaecologists (ACOG) advocates selective screening for patients with high risk factors.

Aims and objectives of this study was to assess the fetomaternal outcome of pregnancy in women with gestational diabetes mellitus.

**METHODS**

This study was carried in the Department of Obstetrics and Gynaecology of Smt. NHL Medical College and its affiliated hospitals over a period of one year from August 2019 to July 2020. 50 patients with abnormal glucose tolerance test having 2 hr post prandial glucose level  $\geq 150$ mg/dl (according to ACOG Guideline) were taken as cases (Group A) whereas 50 patients with normal Glucose tolerance test were taken as controls (Group B). Patients >28 weeks of period of gestation getting admitted to the hospital were included in both the groups.

Informed consent was taken from all the patients. Detailed history was taken including age, gestational age, history of still birth or pregnancy loss, family history of diabetes, past history of diabetes, obstetric history. Detailed examination was done. Various parameters noted were mode of delivery, foetal weight, maternal and neonatal complications, and neonatal intensive care admission.

**EXCLUSION CRITERIA**

- Pregnant women with pre-existing diabetes
- Pregnant women with any other high risk factors

**RESULTS**

Table 1 shows various patient parameters. As is seen gestational diabetes is common in 31-35-year age group.

Also, there was a significant family history of diabetes mellitus with positive family history in 64% cases.

**Table 1: Comparison of various patient variables.**

Parameter	Group A	Group B	P value
<b>Age (years)</b>			0.055
20-25	4	12	
25-30	9	14	
31-35	26	19	
>35	11	5	
<b>Family history</b>	32	1	
Past history	8	0	
<b>O/H</b>			0.493
G1	9	14	
G2-G4	15	13	
>G4	26	23	
<b>Gestational age</b>			0.317
<37 weeks	12	8	
>37 weeks	38	42	
<b>No. of abortions</b>			0.483
1-2	14	4	
>2	8	1	
<b>BMI</b>			0.00001
<18.9	1	2	
19-25	12	36	
26-30	28	11	
>30	9	1	

16% of patients with GDM had previous history of gestational diabetes mellitus. Diabetes was more prevalent in Para 4 patients or more followed by P2-P3 group. Number of abortions was more common in GDM group though the difference was not statistically significant. BMI was significantly higher in GDM group with 18% patients being obese and 58% being overweight.

After applying chi square test to table1, P value for age, obstetric history & gestational age were more than 0.05 which suggest there is no significant difference in both groups between age, obstetric history & gestational age. However P value for no. of abortion was also more than 0.05 which is statistically not significant but clinically significant. Chances of abortion are higher in a diabetic mother than non-diabetic mother.

P value for BMI was less than 0.05 which is statistically very significant. Women with higher BMI and who are obese are more prone to develop diabetes during pregnancy.

**Table 2: Maternal complications among groups.**

Parameter	Group A	Group B
Polyhydramnios	26	2
Pre-term labour	11	1
Pre-eclampsia	16	4
APH	3	1
IUGR	2	1
PPH	1	0
Sepsis	0	0
Wound infection	1	1

Table 2 shows various maternal complications. 52% patients had polyhydramnios and 32% developed preeclampsia. Preterm labour was common in 22% of GDM patients and 2% of non GDM group.

Neonatal complications were seen more frequently in babies of diabetic mothers. Prematurity was seen in 30%, neonatal hypoglycemia in 26% babies in GDM group. 12% babies developed birth asphyxia and 6% developed jaundice.

Fetal macrosomia was seen in 18% of babies in GDM group and 2% in non GDM group. Neonatal admission was seen more frequently in GDM group with 52% babies compared to 14% in non-diabetic group. Congenital deformity was seen in 4% babies of GDM group and 2% of Non GDM group.

**Table 3: Neonatal complications.**

Parameter	Group A	Group B	P value
Prematurity	15	2	
Hypoglycemia	12	0	
Asphyxia	6	2	
Jaundice	3	0	
IUD	5	1	
Sepsis	1	0	
<b>Birth weight</b>			0.018
<2.5	4	8	
2.5-4	37	41	
>4	9	1	
<b>Appar score(mean)</b>			
1 minute	7.5	8.3	
5 minutes	9.5	9.8	
Neonatal admission	26	7	
Congenital deformity	2	1	

As seen in Table 4, LSCS rate was much high in GDM group (74%) compared to 26% in non GDM group. One patient in GDM group developed shoulder dystocia.

After applying chi square test to birth weight, P value was greater than 0.05 which is statistically significant as women with GDM had higher birth weight than non GDM women.

**Table 4: Mode of delivery.**

Parameter	Group A	Group B
Vaginal delivery	17%	53%
Assisted vaginal delivery	9%	21%
LSCS	74%	26%
PPH	7%	3%
Shoulder dystocia	1%	0

Table 5 shows that average birth weight was high in patients with high HbA1c levels. Average fetal weight was 3.9 kg in patients with >7% HbA1c.

As is seen in Table 6, 32 patients turned up for follow up and 43.75% of the patients developed overt diabetes once they were followed over a period of one year.

**Table 5: Association of HbA1c and fetal weight.**

HbA1c	Average fetal weight (kg)
<5	2.7
5-6	3.1
6-7	3.6
>7	3.9

**Table 6: Development of overt diabetics after delivery.**

Parameter	Number	Percentage
GDM turned diabetics	14/32	43.75%

**DISCUSSION**

This study was conducted in Department of Obstetrics and gynaecology in Smt. NHL Municipal Medical College, Ellisbridge, Ahmedabad with two groups of 50 patients each.

Untreated gestational diabetes during pregnancy is associated with higher rates of maternal morbidity and mortality. The purpose of screening and management of GDM is to prevent stillbirth, congenital anomalies, recurrent abortion, pre-eclampsia, intra uterine death and decrease incidence of macrosomic babies hence reducing maternal and perinatal morbidity and mortality. The findings of the

present study confirmed that GDM patients are liable to have poor pregnancy outcomes. Present study showed gestational diabetes to be more common in 31-35 year of age group. Hence increasing age of patient was significantly associated with GDM. Increased incidence of GDM in patients with higher parity with most of patients being Gravida 4 Or more. The present study showed that of 44% GDM cases had abortions compared to 10% among non GDM. In this study recurrence rate of GDM was seen in the current pregnancy among 13% of women. Another risk factor for GDM is positive family history. In present study, positive family history was 64%.

This study indicate a positive correlation between GDM and development of pre-eclampsia (32% in Group A versus 8% in Group B). Polyhydramnios was noted in 52% GDM cases.

Mode of delivery was often influenced by the increased size of the baby, poor past obstetric history and fetal distress. In this study, caesarean section rate was 74%. The main indications for CS being previous caesarean, cephalopelvic disproportion, fetal distress, malpresentation and fetal macrosomic. The present study showed 9% of perinatal deaths in GDM compared to 1% deaths in control group. In this preterm delivery was observed in 22% women with GDM. NICU admission was required in 52% newborn of GDM women in present study. Higher NICU admission in the present study may be reflected by the routine policy of managing these infants at referral hospital. Mean Apgar score at birth was comparable in both the groups. Macrosomia or babies weighing >4 kg at birth in GDM, was noted in 18% of the study group.

#### CONCLUSION

The study concluded that risks factors for GDM include increased maternal age, obesity, poor past obstetric history, family history of DM and previous history of GDM. There was increased frequency of pre-eclampsia, preterm delivery, operative interference, macrosomia, in GDM in women compared to non GDM group. The increased fetal complications observed in the study were intrauterine death, NICU admission, respiratory distress syndrome, jaundice and fetal macrosomia.

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