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Original Research Article

Fetomaternal outcome in women with gestational diabetes mellitus

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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 the department of obstetrics and gynecology GMC Srinagar. Patients with period of gestation more than 28 weeks with Gestational Diabetes Mellitus were included in study group and 100 non-diabetic patients with similar period of gestation were taken as controls. Risk factors and fetomaternal outcome was 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 (42.8%) 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.

Keywords: Antepartum complications, Caesarean section, Gestational diabetes mellitus, Macrosomia

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]

Women with gestational diabetes are characterized to have a relatively diminished insulin secretion and pregnancy induced insulin resistance primarily present in the skeletal muscle tissue. 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. These changes are results of the progressive rise in the levels of estrogen, progesterone, human placental lactogen, cortisol and prolactin as pregnancy advances. Many of these hormones are insulin antagonists which causes insulin resistance in the mother and cause abnormal glucose tolerance in some women rendering them to develop gestational diabetes.[2]

The magnitude of GDM varies according to the country and the ethical groups. The life style, educational status, family history of diabetes and other factors play an important role.[3-7] Based on National Diabetes Data Group criteria, the percentage of women who develop GDM was 4%.[8] However, the fourth international workshop conference on Gestational Diabetes showed that the percentage of pregnant women developing GDM increased to 7% resulting in more than 200,000 cases annually.[9]

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 Gynecologists (ACOG) advocates selective screening for patients with high risk factors such as history of previous GDM, strong family history of diabetes, member of an ethnic group with high prevalence of GDM, maternal age more than 25 years, obesity, persistent glycosuria, macrosomia (birth weight >4 gram,) polycystic ovarian syndrome, significant past obstetrical history.[10]

Maternal complications in GDM include increased incidence of asymptomatic bacteriuria, urinary tract infections, increased incidence of pre- eclampsia, polyhydramnios which may increase the incidence of preterm labor, placental abruption and post-partum hemorrhage and increased risk of operative delivery. The various fetal complications include intra uterine death, macrosomia, shoulder dystocia, increase incidence of respiratory distress syndrome, hypoglycemia, hypocalcemia, congenital malformations, polycythemia, hyperbilirubinemia. Long term complications include obesity, development of type 2 diabetes mellitus during childhood, impaired motor functions and higher rates of in attention deficit syndrome.[11]

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

METHODS

This study was carried in the Department of Obstetrics and Gynecology GMC Srinagar over a period of one year from August 2014 to August 2015. 100 patients with gestational diabetes mellitus were taken as cases whereas 100 patients with normal Glucose tolerance test were taken as controls. Patients >28 weeks of period of gestation getting admitted to the labor room 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, fetal weight, maternal and neonatal complications, and neonatal intensive care admission.

Exclusion criteria

- Pregnant women with pre-existing diabetes
- Statistical analysis was done using SPSS software.

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	Diabetic group	Non-diabetic group	P value
Age (years)			
20-25	9	23	
25-30	20	27	0.004955
31-35	50	41	
>35	21	9	
Family history	64	1	0.00
Past history	13	0	0.6526
O/H			
G1	19	28	0.3153
G2-G4	30	28	
>G4	51	44	
Gestational age			
<37 weeks	23	5	
>37 weeks	77	95	0.0002443
No. of abortions			
1-2	31	6	
>2	11	1	0.4977
BMI			
<18.9	0	3	0.0000001
19-25	22	76	
26-30	61	20	
>30	17	1	

13% 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 17% patients being obese and 61% being overweight.

Table 2: Maternal complications among groups.

Parameter	Diabetic group	Non-diabetic	P value
Polyhydramnios	47	3	0.3451
Pre-term labor	23	5	
Pre-eclampsia	44	6	
APH	6	1	
IUGR	3	1	
PPH	1	0	
Sepsis	0	0	
Wound infection	1	1	

Table 2 shows various maternal complications. 47% patients had polyhydramnios and 44% developed preeclampsia. Preterm labor was common in 23% of GDM patients and 5% of non GDM group.

Neonatal complications were seen more frequently in babies of diabetic mothers. Prematurity was seen in 31%, neonatal hypoglycemia in 27% babies in GDM group. 11% babies developed birth asphyxia and 6% developed jaundice.

Fetal macrosomia was seen in 17% of babies in GDM group and 2% in non GDM group. Neonatal admission was seen more frequently in GDM group with 53% babies compared to 11% in non-diabetic group. Congenital deformity was seen in 2% babies of GDM group and 1% of Non GDM group.

Table 3: Neonatal complications.

Parameter	Diabetic	Non-Diabetic	P value
Prematurity	31	4	0.2597
Hypoglycemia	27	0	
Asphyxia	11	3	
Jaundice	6	0	
IUD	9	1	
Sepsis	1	0	
Birth weight			
<2.5	8	15	0.0007550
2.5-4	75	83	
>4	17	2	
Mean			
Apgar score(mean)			
1 minute	7.5	8.3	
5 minutes	9.5	9.8	
Neonatal admission	53	11	1
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.

Table 4: Mode of delivery.

Parameter	Diabetic group	Non-diabetic group
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, 63 patients turned up for follow up and 42.85% 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 diabetes	27/63	42.85%

DISCUSSION

This study was conducted in Department of Obstetrics and gynecology GMC Srinagar with two groups of 100 patients each.

Over past years studies have strongly indicated that 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 with majority belonging to age group of 31-35 years. Similarly, Ismail NA et al, reported the mean maternal age of GDM in their study to be 27.9 years.[12] 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 42% GDM cases had abortions compared to 7% among non GDM. Similarly, Serirat et al, showed that 14% GDM had history of unexplained stillbirths or abortions.[13] In this study recurrence rate of GDM was seen in the current pregnancy among 13%of women which was higher than the findings of Gaisim T et al, was 9.5%.[14] Another risk factor for GDM is positive family history. In present study, positive family history was 64% which was comparatively higher to findings of Serirat S et al, (23.1%) and Wahi P et al, (24.19%).[15]

Several studies indicate a positive correlation between GDM and development of pre-eclampsia (44% versus 6%). Polyhydramnios was noted in 47%% GDM cases. However, in the findings reported by Ismail NA et al and Gaisim T et al, the association was 2.65% and 3.2 respectively.

Mode of delivery was often influenced by the increased size of the baby, poor past obstetric history and fetal distress. In this study, caesarian section rate was 74%

which is higher compared to the findings of Jensen DM et al, Bener AB et al and Saxena P et al, who observed CS rate as 33%, 27.9%, 42% respectively.[16-18] The main indications for CS being previous caesarian, 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 31% women with GDM which is higher figure reported by Gaisim T (11.4%) and Bener A et al (12.6%).[14,17] NICU admission was required in 53% newborn of GDM women in present study. However, Rabinder D et al and Patterson G et al, showed frequency of 3.4% and 3% respectively.[19] 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. Similarly, Fadl HE et al, observed no difference in apgar score between babies born to women in both groups.[20] Macrosomia or babies weighing >4 kg at birth in GDM, was noted in 17% of the study group. This observation comparable to the observations of Wahi P et al and Bener AB et al where macrosomia was seen in 16.2%, and 10.3% respectively.[15,17]

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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REFERENCES

1. Seshiah V, Das AK, Balaji V, Joshi SR, Parikh MN, Gupta S. Diabetes in pregnancy study group. Gestational diabetes mellitus-guidelines. J Assoc Physicians Ind. 2006;54:622-8.
2. O'Sullivan, Mahan CM. Criteria for oral glucose tolerance test in pregnancy. Diabetes. 1964;13:278.
3. Harlass HE, Brady K, Read JA. Reproducibility of the oral glucose tolerance test in pregnancy. Am J Obstet Gynecol. 1991;164:564-8.
4. Lavin JP, Barden TP, Miodovnik M. Clinical experience with a screening programme for gestational diabetes. Am J Obstet Gynecol. 1981;141(5):491-4.
5. Lemen PM, Wigton TR, MillMcCarthey AJ, Cruikshank DP. Screening for gestational diabetes mellitus in adolescent pregnancies. Am J Obstet Gynecol. 1998;178(6):1251-6.
6. Marguette GP, Klein VR, Niebyl JR. Efficacy of screening for gestational diabetes. Am J Perinatol. 1985;2(1):7-9.
7. Moses RG, Moses J, Davis WS. Gestational diabetes: do lean young Caucasian women need to be tested. Diabetes care. 1998;21(11):1803-06.
8. National Diabetes Data Group. Classification and diagnosis of diabetes mellitus and other categories of glucose intolerance. Diabetes. 1979;28:1039-57.
9. Naylor CD, Serner M, Chen E, Sykora K. Caesarean delivery in relation to birth weight and gestational glucose intolerance: pathophysiology or practice style. JAMA. 1996;275:1165-70.
10. Fernando A, Daftary SN, Bhide AG. Diabetes in pregnancy. In practical guide to high risk pregnancy and delivery. 3rd edition. Noida: Saunders Elsevier; 2008;17:440.
11. Abha S. Screening of diabetes mellitus: why? when? and how?. Obstetrics and Gynaecology Today. 2009;14:233-4.
12. Ismail NA, Aris NM, Mahdy ZA, Ahmad S, Naim NM, Siraj HH, Zakaria SZ. Gestational diabetes mellitus in primigravidae: a mild disease. Acta Medica (Hradec Kralove). 2011;54(1):21-4.
13. Serriat S, Suthornhtepvarakul T, Durochawong C, Jinayon P. Gestational diabetes mellitus. J Med Assoc Thailand. 1992;75:315-9.
14. Gaisim T. Gestational diabetes mellitus: maternal and perinatal outcome in 220 saudi women. a prospective study. 2012;27(2):140-4.
15. Wahi P, Dogra V, Jandial K. Prevalence of gestational diabetes mellitus and its outcome in Jammu region. J Assoc Phy Ind. 2011;59:277-30.
16. Jensen DM, Srensen B, Jorgensen NF. Maternal and perinatal outcome in 143 Danish women with gestational diabetes mellitus and 143 controls with a similar risk profile. A case control study. Diabetic Med. 2002;17(4):281-6.
17. Bener AB, Saleh NM, Hamaq AM. Prevalence of gestational diabetes and associated maternal and neonatal complications in a fast-developing community: Global comparisons. A prospective cohort study. Int J Women's Health. 2011;3:367-73.
18. Saxena P, Tyagi S, Prakash A. Pregnancy outcome in women with gestational diabetes mellitus in a tertiary hospital of north India. A retrospective study. Ind J Community Med. 2011;36(2):120-3.
19. Rabinerson D, Hod M, Kaplan B. Perinatal complications following diabetes mellitus. Acta. Obstet and Gynaecol. 1996;75:809-15.
20. Fadl HE, Ostlund IK, Magnuson AF. Maternal and neonatal outcomes and time trends if gestational diabetes mellitus in Sweden from 1991-2003. A population based cohort study. Diabet Med. 2010;27(4):436-41.

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