

Pregnancy outcome in Gestational Diabetes Mellitus (GDM)

B.H. Narayani¹, G. Baby Shalini²

Abstract

Background: Glucose intolerance with its first onset or first recognition during pregnancy is called as GDM. Women with GDM are at an increased risk for both maternal and fetal adverse outcome. *Aim:* To study the pregnancy outcome in women diagnosed with GDM. *Materials and Methods:* It is a retrospective study in which records were studied by follow up from January 2017 to December 2017. Their demographic features, associated maternal conditions, adverse maternal and perinatal outcome were noted. *Results:* Out of 2118 records studied total of 56 of GDM patients were detected according to diagnostic criteria. In those patients 54 % belong to the age group 25-30 years. 11% belong to the rural and 89% belong to urban population. GDM patients had a higher incidence of PIH, Hypothyroidism, high incidence of UTI and candidiasis. There was higher incidence of cesarean delivery, higher admissions to NICU. 41.07% of patients had their blood glucose level controlled on diet therapy. Others required oral hypoglycemic and/or insulin. Majority of second gravida patients had history of GDM in previous pregnancy. *Conclusion:* Incidence of GDM is on rise, as it is associated with adverse maternal as well as adverse fetal outcome, early diagnosis and a good control of blood sugar levels should be done in order to achieve optimal maternal and perinatal outcome.

Keywords: Gestational Diabetes (GDM); Gestational Hypertension; Cesarean Section; Birth Weight; NICU.

Introduction

Indian population especially, south Indians are considered high risk for developing diabetes. Because of placental hormones there is increased insulin resistance in pregnancy per se. The incidence of gestational diabetes is on an increase due to universal screening protocol, changing lifestyle, increasing BMI, sedentary lifestyle. World Health Organization defines gestational diabetes mellitus (GDM) is defined as any degree of glucose intolerance with onset or first recognized during pregnancy.

Materials and Methods

It is a retrospective study conducted in Srinivas institute of Medical Sciences and Research Centre, Mangalore Fetal Medicine and other private hospitals in which records were studied by follow up from January 2017 to December 2017. Out of 2118 record studied 56 GDM patients were detected. Most patients had a DIPSI (75gms) done at 24 -28 weeks. It was done earlier if any high risk factors were there like previous still birth, family history of diabetes. If positive, she was designated as GDM and after that few women had repeated FBS and PPBS reports. Blood sugar value more than 140 mg/dl was taken as cut off for designating GDM. Initially, patients were started on diabetic diet and were asked come with FBS and PPBS reports depending upon blood sugar level and gestational age. If blood sugar levels

¹Professor & Head

²Assistant Professor,
Department of Obstetrics
and Gynecology, Srinivas
Institute of Medical
Sciences and Research
Centre, Mukka, Surathkal,
Mangaluru, Karnataka
574146, India.

Corresponding Author:

G. Baby Shalini,
Assistant Professor,
Department of Obstetrics
and Gynecology, Srinivas
Institute of Medical
Sciences and Research
Centre, Mukka, Surathkal,
Mangaluru, Karnataka
574146, India.

E-mail:

bhnarayani@gmail.com

Received on 29.09.2018,

Accepted on 16.10.2018

were not controlled on diabetic diet, then they were either started on Metformin or Insulin.

The most of the women had regular antenatal care. All antenatal investigations were performed. ultrasound scan was performed at 18–20 weeks in all patients. Any antenatal complications were noted and treated accordingly.

Results

The incidence of GDM was 2.64%. Majorities (69.64%) of women were from rural population and 32.14% women had family history of diabetes (Table 1).

Most of the GDM patients were managed by diet therapy (41.07%) and 14.29 % women were treated with both Metformin and Insulin (Table 2).

Commonest associated medical condition in our study group was hypothyroidism (46.43%) and 37.50

% women had gestational hypertension. Infections like candidiasis (14.29%) and UTI (19.64%) were more frequently encountered in study group. Post partum haemorrhage (PPH) was seen in 19.64% cases (Table 3).

Majority of women delivered during term gestation (60.72%) and 7.14% women delivered before 34 weeks (Table 4).

Table 5 shows the commonest mode of delivery was Cesarean Section (73.21%). In that indications for cesarean delivery were like for previous cesarean (32.5%), non progress of labour (29%), for fetal distress (23%), and for breech (7%).

Babies born to GDM mothers were more often had NICU admission (44.64%) and 12.50% babies had hypoglycemia (Table 6).

35.71% babies born to GDM mothers birth weight was more than 3.0 kg (Table 7).

Table 1: Demographic features of women with GDM

Features	Number	Percentage
Elderly gravid > 30	16	28.57
Religion	28 Hindu / 18 Muslim / 10 Christian	50 / 32.14 / 17.86
Rural population	39	69.64
Urban population	17	30.36
Family history of Diabetes	18	32.14

Table 2: Modes of Treatment of GDM patients

Modes of Treatment	Number	Percentage
Diet alone	23	41.07
Oral Hypoglycemic Agents	13	23.21
Insulin	12	21.43
OHA and Insulin	8	14.29

Table 3: Antenatal and Postnatal Complications

Complications	Number	Percentage
Gestational Hypertension	21	37.50
Chronic Hypertension	3	5.36
Hypothyroidism	26	46.43
Oligohydramnios	7	12.50
Polyhydramnios	20	35.71
UTI	11	19.64
Candidiasis	8	14.29
APH	3	5.36
PPH	11	19.64

Table 4: Gestational Age at delivery

Gestational age	Number	Percentage
37-40 weeks	34	60.72
34-37 weeks	18	32.14
<34 weeks	4	7.14

Table 5: Mode of Delivery

Mode of delivery	Number	Percentage
Cesarean Section	41	73.21
Vaginal Delivery	15	26.79

Table 6: Perinatal Outcome

Perinatal Outcome	Number	Percentage
NICU admission	25	44.64
Hyperbilirubinemia	13	23.21
Hypoglycemia	7	12.50

Table 7: Birth Weight of Fetuses born to GDM

Birth Weight	<2.5 Kg	2.5 - 3 Kg	>3 Kg
Number	5	31	20
Percentage	8.93	55.36	35.71

Discussion

Gestational diabetes comprises of 4.2% of the total patients screened according to Dudhwadkar AR et al. [1]. In our study 54 % patients belong to the age group 25-30 years. 11% belong to the rural and 89% belong to urban population. The study by Rajput et al.[5] showed that higher parity would have a higher rate of GDM. 18 patients had positive family history as a risk factor was noted in 32.14% patients in this study. Prakash GT [2] the average age was 28 years. The median gravidity was two. Fifty-three women (38%) were primigravida. Forty-nine women had prior history of abortion, intrauterine death or both and 25 (18%) of them satisfied the definition of BOH. Twenty women (23%) had a history of GDM, and 60 women (43%) had a first-degree relative having diabetes. Kumari, et al. [3] found prevalence of GDM to be 5.7% in their study. There was no significant difference in age, BMI, and religion in both groups. However, there was a significant difference in socioeconomic status with a significantly higher number of women in middle socioeconomic class in GDM (63.5%) as compared to control (46.6%) ($p= 0.001$). Family history of diabetes was observed in a significantly higher number of GDM patients (22.4%) as compared to control group (10%) ($p = 0.002$). Prakash G [4] the majority of the study subjects were in the age group of 26-30 years (59.3%). The mean age of the GDM patients was 27.2 years and the majority (80.6%) had the BMI of more than 25. Most of them were primi gravida and majority belong to the lower middle and upper lower type of socioeconomic class. The risk factors found to be associated with the gestational diabetes among the

study population were age more than 30 years, BMI of more than 25, family history both father and mother being diabetic, having a bad obstetric history, primigravida and the mothers who had gained more than 7 kgs in the first two trimesters. Rajput R et al. [5] GDM was diagnosed in 43 (7.1%) women. The mean age of participants was 23.62 ± 3.42 yr (range 18-38). The prevalence rate was higher in women aged 26-30 and >30 yr (11.57 and 34.8%, respectively) and this observation was found to be statistically significant. GDM rate increased with increasing educational qualification of the participants with highest being in women who were graduate or above (14.3%). This observation was found to be statistically significant. The prevalence of GDM was found to be higher in women belonging to upper and upper middle class (5/20, 25% and 20/119, 16.8%, respectively) and it was statistically significant. 16.3% women with GDM had positive family history compared to 7.6% women without GDM. The association of history of GDM in previous pregnancy with GDM in index pregnancy was found to be significant.

Madi et al. [7] In their study, the prevalence of GDM was 1.3%. In our study 60% patients were in the age group 25 -30 years whereas 30% were in the age group more than 30 years. 17.5% patients had a history of previous neonatal death and 25% had a history of previous spontaneous abortion.

In our study control of blood sugar in 23 (41.07%) patients were managed on dietary control where as 58.93% required either insulin or metformin or both. Whereas according to Prakash GT [2] 17% were managed with dietary advice alone. 18% were treated with metformin. 58% received insulin, and 7% were treated with metformin and insulin. Kumari, et al. [3]

found a total of 79.41% were controlled on diet, whereas 12.35% required insulin and 8.23% were treated with oral hypoglycemic agent (metformin). Syeda Birjees [9] Observed a significant direct correlation with blood glucose fasting levels of the patients and complications in current pregnancy. E. G. Deryabina et al. [10] all women in their study with GDM were managed by dietary regulation.

Dudhwadkar AR et al. [1] reported 78% of the delivered babies were full term, but 22% were pre term. Prakash GT [2] the mean gestational age at delivery was 37 weeks. Kumari, et al. [3] Preterm delivery rate was higher (10.6%) in GDM patients as compared to control group (3.1%). In our study 60.72% were term deliveries and rest was preterm.

Dudhwadkar AR et al. [1] also reported antenatal risk factors were detected in 90% patients. Preeclampsia complicating pregnancy was noted in 13 patients (26%). Hypothyroidism was seen in 3 patients (6%). 9 patients (18%) had bad obstetric history. Polyhydramnios was noted in 10 patients (20%). Prakash GT [2] 31% had HTN of which 79.54% women had gestational HTN, and 20.45% women had chronic HTN. 30% had hypothyroidism. Kumari, et al. [3] Gestational hypertension and preeclampsia (pregnancy-induced hypertension) were seen in a significantly higher number of cases in GDM patients as compared to controls (13.5% vs. 6.3%) whereas polyhydramnios was also seen in higher number in GDM (Prevalence of other antenatal complications such as UTI and candidiasis was similar in two groups. Postpartum hemorrhage and postpartum complication were also similar in two groups. Prakash G [4] Among the various complications acquired by the maternal mothers the most common was found to be the vaginal candidiasis (38.6%) followed by premature rupture of membranes (18.6%). Out of the entire study subjects only 6 maternal mothers had developed hypertension and 17 had hypothyroidism. Ambarisha et al. [6] 63.49% cases developed comorbidities with GDM. 11.11% developed preeclampsia, 9.52% had polyhydramnios, 5.8% patients went into preterm labour, 1.58% cases had APH1 and one case had PPH. Syeda Birjees [9] 26.7% had oligohydramnias, 40% had adequate liquor and 26.7% with polyhydramnias. In our study Candidiasis seen in 14.29% cases, Gestational hypertension in 37.50% cases, APH in 5.36% cases and PPH in 19.64% cases. Gestational Diabetes were characterized as presenting a greater prevalence of some risk factor known such as macrosomia and a previous stillbirth Reichelt [8]

Dudhwadkar AR et al. [1] 23 patients (46%) delivered vaginally. 14% were induced with PGE2

gel while 32% had spontaneous vaginal delivery. Vacuum assisted delivery was seen in 2% (n=1) patients. 52% patients underwent Lower segment caesarean section (LSCS). Prakash GT [2] Seventy-four (56%) mothers delivered vaginally (7 required forceps assistance) and 58 (44%) required cesarean section. In comparison, 22% of controls underwent cesarean section. Thirty-four cesarean sections were elective. The indications were previous cesarean section (19), BOH (10), in vitro fertilization (4), and macrosomia (1). Twenty-four women underwent emergency cesarean section, and the most common indication was unsatisfactory progress of labor. Kumari, et al. [3] There was no significant difference in the mode of delivery between the two groups Prakash G [4] The most common mode of delivery in our study population was elective caesarean (59.3%) and 28% had undergone emergency. LSCS for causes like maternal and foetal distress. Of the total babies delivered only 16 babies were delivered as postdated. Syeda Birjees [9] 33.3% patients had normal vaginal delivery while 66.7% had interventional deliveries out of these 50% had LSCS, 10.0% had instrumental deliveries. In our study 73.21% had undergone cesarean section.

Dudhwadkar AR et al. [1] reported perinatal mortality was seen in 8% patients with four perinatal deaths and two fetuses with anencephaly, 46 mothers (92%) took live babies home. 40% babies were >3.5 kg while 24% were 3.0–3.49kg. Both these groups together constituted 64% of all babies. 12% were <2.0 kg. A total of 8% babies had congenital malformations. Hyperbilirubinemia was seen in 10% babies. Prakash GT [2] reported the average birth weight was 2.85 kg. The average birth weight among controls was 2.75 kg. 22% had suffered complications, and they had been admitted to the Neonatal Intensive Care Unit (NICU). 4.5% had developed hypoglycemia which could be managed with oral feeds alone. Three neonates had congenital anomalies.

Kumari, et al. [3] reported mean birth weight was significantly higher in (2848.8 ± 539.4 g) GDM group as compared to control (2707.5 ± 648.4 g) (p = 0.04). There was no significant difference in Apgar score at 1 and 5 min in two groups. Neonatal complications such as hypoglycemia was seen in significantly higher number of cases in GDM group (20.6%) as compared to control group (5.2%) (p = 0.001). However, incidence of hyperbilirubinemia and congenital malformations was not significantly different in two groups. Prakash G [4] The mean weight of the newborn was 3.26 kgs, which was found to be high than the national average which is 3 kgs. Ambarisha et al. [6] 19.57% cases developed macrosomia, 11.6% babies were admitted to NICU

and 7.40 developed hypoglycemia and 3.70% had hyperbilirubinemia. 3.17% Intra Uterine Deaths and 1.05% still born were documented. In our study 35.71% were of birth weight more than 3 kg. 55.36% had birth weight between 2.5 -3 kg.

Conclusion

Incidence of GDM is on rise in our country due to changing lifestyles, stress in life, late marriages, and genetically prone race. It is advisable to do early diagnosis and a good control of blood sugar levels in order to achieve optimal maternal and perinatal outcome.

Reference

1. Dudhwadkar AR, Fonseca MN. Maternal and Fetal Outcome in Gestational Diabetes Mellitus. *Int J Reprod Contracept Obstet Gynecol.* 2016;5:3317-21.
2. Prakash GT, Das AK, Habeebullah S, Bhat V, Shamanna Sb. Maternal And Neonatal Outcome In Mothers With Gestational Diabetes Mellitus. *Indian Journal of Endocrinology and Metabolism.* 2017;21(6):854-58. Doi:10.4103/Ijem.Ijem_66_17.
3. Kumari R, Dalal V, Kachhawa G, Sahoo I, Khadgawat R, Mahey R. Maternal And Perinatal Outcome In Gestational Diabetes Mellitus In A Tertiary Care Hospital In Delhi. *Indian J Endocr Metab.* 2018;22: 116-20.
4. Prakash G, Vasanthakumar AJ, Elanchezhian JA, Vijayaraju D, Yoganandh T, Shankar R. Maternal And Foetal Outcomes Of Gestational Diabetes Mothers Treated With Human Insulin. *Int Arch Biomed Clin Res.* 2016;2(3):75-79. Doi:10.21276/Iabcr.2016.2.3.19.
5. Rajput R, Yadav Y, Nanda S, Rajput M. Prevalence of Gestational Diabetes Mellitus & Associated Risk Factors At A Tertiary Care Hospital in Haryana. *The Indian Journal of Medical Research.* 2013;137(4): 728-33.
6. Ambarisha Bhandiwad, Divyasree B, Surakshith L. Gowda Adverse Maternal And Perinatal Outcomes In Gestational Diabetes Mellitus *Int J Med Res Health Sci.* 2015; 4(4):775-77.
7. José Mauro Madi, Camila Viecceli, Daniel Ongaratto Barazzetti, Gabriela Pavan, Cristinabergmann Triches, Breno Fauth De Araújo. Gestational Diabetes And Perinatal Outcomes: A Casecontrol Study. *Journal of Medicine and Medical Science.* 2011;2(8):1022-27.
8. Reichelt AOM, Schimidt M. Guidelines of the 2nd Meeting of the, Diabetes and Pregnancy Task Force. *Arq. Bras. Endocrinol. Metabol.* 2002;46:574-81.
9. Syeda Birjees Anwar Kazmi, Syed Abid Hassan Naqvi, Zamir Iqbal *et al.* Maternal and Neonatal Outcomes of Gestational Diabetes Mellitus *PJMHS* 2012;6(2):32.
10. Deryabina EG, Yakornova GV, Pestryaeva LA, Sandyreva ND. Perinatal Outcome In Pregnancies Complicated With Gestational Diabetes Mellitus and 2016 Very Preterm Birth: Case-Control Study, *Gynecological Endocrinology.* 2016;32(2):52-55. Doi: 10.1080/09513590.2016.1232215.