International Journal of Clinical Obstetrics and Gynaecology

ISSN (P): 2522-6614
ISSN (E): 2522-6622

www.gynaecologyjournal.com
2019; 3(5): 306-309
Received: 21-07-2019
Accepted: 23-08-2019

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Gestational diabetes mellitus and pregnancy outcomes at a tertiary care centre of eastern Uttar Pradesh

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DOI: https://doi.org/10.33545/gynae.2019.v3.i5e.369

Abstract
Diabetes is one of the most common medical complications of pregnancy. It complicates 2 to 5% of pregnancies of which 90% is contributed by Gestational Diabetes Mellitus (GDM).
Objectives: To study the prevalence of GDM and compare the fetomaternal outcomes with the normal antenatal population.
Methodology: This was an analytical study conducted on 350 pregnant women attending antenatal OPD irrespective of gestational age. Each woman was tested for glucose intolerance according to DIPSI criteria for GDM. A value of 140mg/dl or more was used for diagnosis of gestational diabetes. Feto-maternal outcomes of all pregnancies were analysed.
Results: Out of 350 patients screened in the study, 91 women were diagnosed as GDM, which gave a prevalence of 26%. Overall percentage of complications in pregnancy was higher in GDM group as compared to non GDM group.
Conclusion: GDM has detrimental effects on mother as well as fetus. Hence early detection and treatment would reduce the fetomaternal morbidity and mortality.

Keywords: Gestational diabetes mellitus, prevalence, fetomaternal outcomes

Introduction
Gestational diabetes mellitus is defined as carbohydrate intolerance of variable severity with onset or first recognition in present pregnancy (ACOG 2013). Diabetes is one of the most common medical complication of pregnancy. It complicates 2 to 5% of pregnancies of which 90% is contributed by gestational diabetes mellitus and rest are pregestational diabetics [1] Compared to white Europeans (5.4%), prevalence rate of GDM has increased to 11 fold in women in India (16.5%). Many studies report maternal and fetal complications with GDM but were flawed due to a number of confounding factors such as obesity, older maternal age, and various other co-morbidities [2]. Most convincing evidence of adverse pregnancy outcome in gestational diabetes was provided by Hyperglycaemia and adverse pregnancy outcome (HAPO) study done in nine countries [3]. GDM is important as it poses a risk to the pregnant woman, her fetus and newborn baby. Maternal complications include pre-eclampsia, polyhydramnios, elevated rates of operative delivery, PROM and higher incidence of Type 2 DM later in life [4]. Fetal complications include spontaneous abortion, malformations, altered fetal growth, unexplained fetal demise, hydramnios whereas neonatal complications include respiratory distress syndrome, hypoglycaemia, hypocalcaemia, hyperbilirubinemia, long term impaired cognitive development and risk of inheritance of DM in future [5, 6]. Pregnancy is a diabetogenic condition causing impaired glucose metabolism particularly following ingestion of the meal. These changes start becoming evident in mid-pregnancy period and goes on becoming more severe with advancing pregnancy. The present study is an effort to determine the prevalence of GDM in a tertiary care centre of eastern Uttar Pradesh and to study the maternal and fetal complications of gestational diabetes mellitus and compare these outcomes with the normal antenatal population

Materials and Methods
Place of study: MLN Medical College and SRN Hospital, Prayagraj.

Duration of study: One year

Type of study: Analytical observational study.

Sample size: 350

Sample collection method: Stratified sampling

Inclusion criteria: Patients attending antenatal OPD irrespective of gestational age.

Exclusion criteria: Patients with pregestational diabetes, patients with other diagnosed medical disorders and patients with twin pregnancies.

Procedure

The study was conducted on 350 pregnant patients visiting antenatal OPD. Enrollment was done in the first 3 months of the study and pregnancy outcome was followed up in all the patients for the rest of the time period. Of them 91 patients were diagnosed with GDM according to DIPSI criteria with cutoff value (≥140mg/dl). Initial test was performed at the first visit and subsequent testing was done after 24 weeks of gestation.Women with blood glucose values less than 140 mg/dl were taken as control groups.

Patients with glucose levels in the range of 140 – 200 mg/dl were offered medical nutrition therapy for a period of 2 weeks. In cases of failure to normalise blood sugar levels; fasting≤ 95 mg% and postprandial levels≤120 mg/dl, insulin therapy was offered.

Maternal outcomes of pregnancy like candidiasis, pre-eclampsia, polyhydramnios, increased operative delieveries, perineal tears and fetal outcomes like preterm labor, IUGR, IUD, hypoglycaemia, meconium aspiration syndrome, jaundice, low birth weight and NICU admissions were noted.

Statistical analysis

Results were expressed as number and percentages. Student t test for proportions was used for comparing the GDM and control groups. Calculated P-value <0.05 were considered to be significant.

Results

Out of 350 patients screened in the study, 91 were found having GDM, which gave a prevalence of 26%. This is shown in Fig 1.

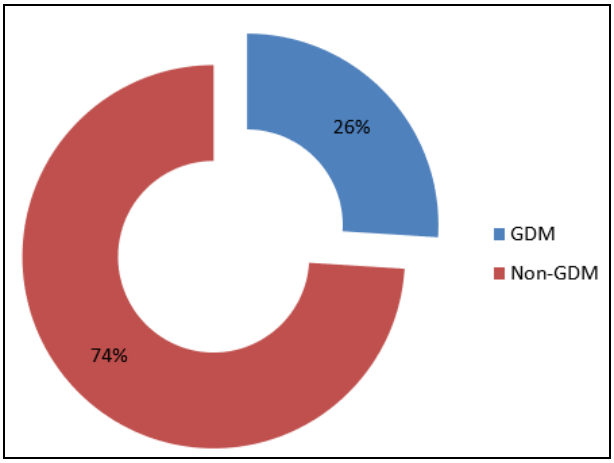

Fig 1: Percentage of GDM and Non-GDM patients.

22 out of 91 patients (24.17%) were screen positive before 24 weeks of gestation while 69 patients (75.83%) were screen positive after 24 weeks of gestation, as shown in table 1. 91 out of 259 patients (35.14%) were screen negative before 24 weeks of gestation whereas 168(64.86%) were beyond 24 weeks of gestation. The result was statistically significant.

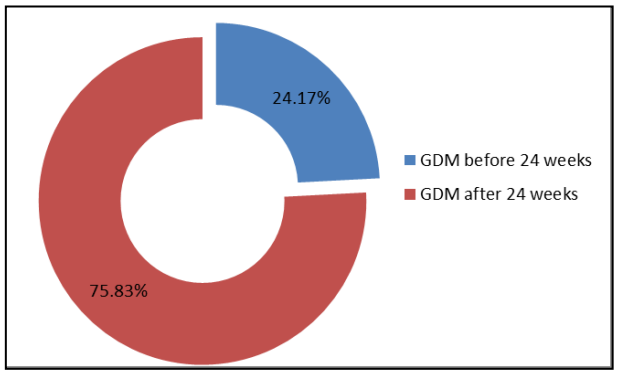

Fig 2: Percentage of patients diagnosed with GDM according to gestational age

Table 1: Association of GDM with gestational age

S. no.	Total screened (n = 350)	<24 weeks n= 113(32.28%)		>24 weeks n=237(67.71%)		P value
		N	%	N	%	
1.	Screen positive	22	19.46	69	29.11	<0.05
2.	Screen negative	91	80.53	168	70.88	
	Total	113	100	237	100	

Complications associated with pregnancy were studied in both GDM and non GDM groups and were further compared. Vaginal candidiasis (9.1% versus 1.2%), pre-eclampsia (9.1% versus 2%) and preterm labour (9% versus 2.4%) were more in GDM group as compared to non GDM group and this difference was statistically significant. Other complications of pregnancy like IUGR, IUD and polyhydramnios did not show statistically significant differences. Overall percentage of complications in pregnancy was higher in GDM group as compared to non GDM group, (41.76% as compared to 12.9%), as shown in table 2.

Table 2: Association of pregnancy complications with GDM

S. no.	Pregnancy complications	GDM (n =91)		Non GDM (n =259)		p Value
		No.	%	No.	%	
1.	Vaginal candidiasis	9	9.1	3	1.2	<0.05
2.	Pre-eclampsia	9	9.1	5	2.0	<0.05
3.	Polyhydramnios	3	3.03	6	2.3	0.16
4.	Pre term labour	8	9.1	6	2.3	<0.05
5.	IUGR	6	6.1	5	2.0	0.21
6.	IUD	3	3.03	8	3.1	0.78
7.	Total	38	41.76	33	12.9	<0.05

In GDM group, out of 91 patients, 50 (54.9%) were delivered by normal vaginal delivery. In non GDM group, however, 220 patients (84.9%) delivered vaginally as shown in table 3. The result is statistically significant. In GDM group, 41 out of 91 patients (45.1%) underwent caesarean section as compared to 39 out of 259 patients (15.1%) in non GDM group. Fetal distress and macrosomia were the most common indications in the former group as depicted in table 3.

Table 3: Pattern of delivery

S. N.	Pattern of Delivery	GDM (n= 91)		Non GDM (n= 259)		p Value
		No.	%	No.	%	
1.	Vaginal	n = 50	54.9	n= 220	84.9	<0.05
2.	Caesarean section	n= 41	45.1	n= 39	15.1	<0.05
	a. Fetal distress	13	14.3	15	5.8	<0.05
	b. Macrosomia (≥ 3.5Kg)	11	12.1	4	1.5	<0.05
	c. Obstructed labor	8	8.7	8	3.1	<0.05
	d. Bad obstetric history	3	3.3	4	1.6	<0.05
	e. Other indications (CPD, Contracted pelvis, placenta previa, previous LSCS)	6	6.7	8	3.1	<0.05

Fetal outcome in antenatal patients having GDM showed higher number of infants with preterm births (21.2% versus 8.8%), APGAR score < 7 (27.2% versus 6%) and birth weight > 3.5 Kgs (27.4% versus 1.5%) as compared to non GDM patients. The difference was statistically significant. No statistically significant difference was found between IUD for both the groups as shown in table 4.

Table 4: Fetal outcome in antenatal patients

S. N.			GDM (n=91)		Non GDM (n=259)		p Value
			No.	%	No.	%	
1.	Birth	Preterm	19	21.2	22	8.8	<0.05
		Full Term	72	78.8	228	91.2	
2.	APGAR	<7	25	27.2	15	6.0	<0.05
		> 7	66	72.8	235	94	
3.	Birth weight (Kg)	< 2.5 Kg	6	6.6	17	6.5	
		2.5 – 3.5 Kg	60	66.0	238	92	
		> 3.5 Kg	25	27.4	4	1.5	<0.05
4.	IUD		3	3.3	9	3.47	0.37

GDM group had significantly higher number of NICU admissions for infants as compared to non GDM group (25.3% versus 11.6%). Indications of admissions like neonatal hypoglycaemia and meconium aspiration syndrome were significantly higher than the non GDM group. However parameters like jaundice and low birth weight did not show statistically significant differences as shown in table 5.

Table no. 5: NICU Admissions and indications

S. N.	Indications	GDM (n =91)		Non GDM (n=259)		p Value
		No.	%	No.	%	
1.	Hypoglycemia	8	9.1	2	0.8	<0.05
2	Meconium aspiration syndrome	6	6.1	5	2.0	<0.05
3.	Jaundice	3	3.1	7	2.8	0.73
4.	Low birth weight	3	3.1	8	3.2	0.81
5.	Under Observation	3	3.1	8	3.2	0.92
6.	Total	23	25.3	30	11.6	<0.05

Discussion

Different studies have shown the prevalence of GDM varying from 3.8 to 21% in India. In surveys performed in various cities, the prevalence of GDM was 16.2% in Chennai, 15% in Thiruvananthpuram 21% in Alwaye, 18.8% in Erode and 17.5% in Ludhiana [7, 8]. The study done by Shridevi AS in Davangere, Karnataka reported prevalence of 11.7% [9]. Some other scholars like Wahi *et al.* and Kalyani *et al.* documented lower prevalence 6.94% and 8.33% respectively [10, 11]. In our study strikingly, higher prevalence is explained by the fact that our centre is a tertiary care centre and most of the patients referred are high risk patients who are being sent by the primary and secondary health care centres for better facilities and management.

Detection rate of GDM was more in patients with gestational age >24 weeks as it is already known that insulin resistance increases during the second trimester and glucose levels rise in women who do not have the ability to produce enough insulin to adapt this resistance produced by placental hormones. Performing tests too late in third trimester limits the time in which metabolic interventions can be done [12]. It is because of this, that DIPSI in the year 2006 recommended testing of blood sugar at 24-28 weeks and then repeat testing at 32 weeks of gestation [13].

In our study, maximum association of GDM was seen with pre-eclampsia and vaginal candidiasis. Poor placentation in GDM leads to pre-eclampsia as is seen in our study. This is in accordance with the HAPO study and another study conducted by Nair *et al.* [14, 15]. Non significant association of polyhydramnios with GDM patients in our study does not change the fact that GDM patients do have chances of polyhydramnios. The risk of polyhydramnios is more in uncontrolled GDM. If GDM is well controlled then it leads to same prevalence as in non GDM patients. In a study by Nanda *et al.* the 7.69% of the GDM cases had polyhydramnios whereas none of the patients in the control group had polyhydramnios [16].

Higher Caesarean section rates are due to increased association with obstetrical complications. At the same time there is also obstetrician's apprehension due to unexplained sudden intrauterine death near term which also contributes to high rates of caesarean section. Our results are comparable to studies done by Kalyani *et al.* which reported the incidence of 56% LSCS in GDM group and 31.27% in non GDM group [11].

Poor APGAR score and neonatal hypoglycaemia were the reasons for high NICU admissions and that is why we recommend early initiation and frequent breastfeeding. The baby needs to be closely monitored for 24-48 hrs till the glucose levels normalises. This observation was same as obtained in

studies by Nair *et al.* and Djomhou *et al.* from Cameroon, whereas in the study by Gandhewar *et al.* the incidence of NICU admissions in the GDM group and in the non GDM group were not statistically significant [15, 18, 19]. Our study showed no significant difference in IUD in both the groups as at a tertiary care centre, doctors are over precautious regarding fetal complications of GDM and as a result strict monitoring is done to prevent any fetal complications.

Conclusion

GDM is a rapidly increasing medical disorder during pregnancy and currently this incidence is estimated to be more than 21% in some areas in India. GDM has detrimental effects on mother as well as fetus. Hence screening and early detection is highly recommended. Controlling maternal glycemia with Medical Nutrition Therapy and insulin regimen in uncontrolled GDM with close monitoring of blood glucose levels have shown to significantly reduce the fetomaternal morbidity and mortality.

References

1 Report of the Expert Committee on the Diagnosis and Classification of Diabetes Mellitus. Diabetes Care. 1997; 20:1183-97

2 Weinert LS. International Association of Diabetes and Pregnancy Study Groups recommendations on the diagnosis and classification of hyperglycemia in pregnancy: Comment to the International Association of Diabetes and Pregnancy Study Groups Consensus Panel. Diabetes Care. 2010; 3 3:e97.

3 Metzger BE, Lowe LP, Dyer AR, Trimble ER, Chaovarindr HAPO Study Cooperative Research Group.

4 U *et al*. Hyperglycemia and adverse pregnancy outcomes. N Engl J Med. 2008; 358:1991:2002.

5 Davey RX, Hamblin PS. Selective versus universal screening for gestational diabetes mellitus: An evaluation of predictive risk factors. Med J Aust. 2001; 174:118-21.

6 Dashe JS, Nathan L, McIntire DD *et al*. Correlation between amniotic fluid glucose concentration and amniotic fluid volume in pregnancy complicated by diabetes. Am J Obstet Gynecol. 2000; 182:901

7 DeBoer T, Wewerka S, Bauer PJ *et al*. Explicit memory performance in infants of diabetic mothers at 1 year of age. Dev Med Child Neurol. 2005; 47:525.

8 Seshiah V, Balaji V, Balaji MS, Sanjeevi CB, Green A. Gestational diabetes mellitus in India. J Assoc Physicians India. 2004; 52:707-11.

9 Savitri D Kabade, Durgaprasad M Kabade, Elizabeth Wilson, Karthik SL, Lavanya K. Study of prevalence and outcome of gestational diabetes mellitus at a tertiary care hospital in North Karnataka. International Journal of Contemporary Medical Research. 2017; 4(2):325-328.

10 Shridevi AS, Prabhudev P, Bhovi MR. A clinical study of prevalence of gestational diabetes mellitus and associated risk factors at a tertiary care centre in Karnataka, India. Int J Reprod Contracept Obstet Gynecol. 2015; 4:1840-5.

11 Wahi P, Dogra V, Jandial K, Bhagat R, Gupta R, Gupta S, *et al*. Prevalence of Gestational Diabetes Mellitus (GDM) and its Outcomes in Jammu Region. J Assoc Physicians India. 2011; 59:227-30.

12 Kalyani KR, Jajoo S, Hariharan C, Samal S. Prevalence of gestational diabetes mellitus, its associated risk factors and pregnancy outcomes at a rural setup in central India. Int J Reprod Contracept Obstet Gynecol. 2014; 3:219-4.

13 National guidelines for diagnosis and management of gestational diabetes mellitus. New Delhi. Maternal Health Division, Ministry of Health & Family Welfare. New Delhi: Government of India, 2015.

14 Seshiah V, Balaji V, Balaji S, Sekar A, Sanjeevi CB, Green A. One step screening procedure for screening and diagnosis of gestational diabetes mellitus. J Obstet Gynecol India. 2005; 55(6):525-29.

15 HAPO Study Cooperative Research Group Hyperglycemia and adverse pregnancy outcome (HAPO) study: associations with neonatal anthropometrics. Diabetes. 2009; 58:453–459. doi: 10.2337/db08-1112.

16 Nair VG, Sandhu GS, Biswas M, Bhalla R. Evaluation of the incidence and outcome of gestational diabetes mellitus using the current international consensus guidelines for diagnosing hyperglycaemia in pregnancy. Int J Reprod Contracept Obstet Gynecol. 2016; 5:3361-6

17 Nanda SS, Dash K, Dash S, Misra S, Das S. Screening of gestational diabetes mellitus with 75gm OGTT and its effects on feto-maternal outcome. Screening. 2014; 2:340-4.

18 Kalra P, Kachhwaha CP, Singh HV. Prevalence of gestational diabetes mellitus and its outcome in western Rajasthan. Indian J Endocr Metab. 2013; 17:677-80.

19 Djomhou M, Sobngwi E, Noubiap JJ, Essouma M, Nana P, Fomulu NJ *et al*. Maternal hyperglycemia during labor and related immediate postpartum maternal and perinatal outcomes at the Yaoundé Central Hospital, Cameroon. J Health Popul Nutr. 2016; 35:28.

20 Gandhewar MR, Bhatiyani BR, Singh P, Gaikwad PR. A study of the prevalence of gestational diabetes mellitus and its maternal and fetal outcomes in a tertiary care hospital. Int J Reprod Contracept Obstet Gynecol. 2017; 6:4011-5.