

Prevalence & perinatal outcome of GDM : a tertiary teaching hospital based study**Akshi Agarwal¹, Rajesh Goel^{2*}, Charul Mittal³, Pragya Sharma⁴, Jitendra Ahuja⁵, Meenal Yadav⁶**¹Assistant Professor (Gynae & Obs), SMS Medical College, Jaipur, Rajasthan, India²Associate Professor (Ophthalmology), SMS Medical College, Jaipur, Rajasthan, India³Senior Resident (Gynae & Obs), Mahatma Gandhi Medical College, Jaipur, Rajasthan, India⁴Medical Officer, SMS Medical College, Jaipur, Rajasthan, India⁵Associate Professor, RUHS, Jaipur, Rajasthan, India⁶Resident (Gynae & Obs), SMS Medical College, Jaipur, Rajasthan, India**Received: 02-09-2020 / Revised: 28-10-2020 / Accepted: 26-11-2020****Abstract**

Can we do something to improve outcomes of GDM? Much needs to be done to deal with epidemic of GDM in India as it affects both mother and fetus adversely. This study was aimed to find out the data pertaining to GDM. Using notional sampling frame 200 pregnant women were offered 75 gm oral glucose tolerance test between 24 to 28 weeks of gestation, irrespective of the fasting status as recommended by DIPSI. Patients having values ≥ 140 mg/dl, 2 hrs after administration of 75 gm oral glucose were labelled as GDM. Whole cohort was followed during antenatal period and upto 7 days after delivery for fetomaternal outcome. Prevalence of GDM was 8% in our study. Statistically significant increased rates of gestational hypertension, chronic hypertension, preeclampsia, UTI, preterm delivery, rate of caesarean section and polyhydramnios were found in GDM patients. Statistically significant higher rates of metabolic complications, respiratory distress, admission to neonatal unit and macrosomia were found in neonates of GDM mothers. Hence there is a need for studying outcomes as well as cost effectiveness of different diagnostic criteria while simultaneously creating social awareness, training manpower, and sensitizing policymakers to make GDM testing and management mandatory during pregnancy at all levels.

Keywords: GDM, Pregnancy, tertiary.

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Introduction

Gestational Diabetes mellitus has been defined as carbohydrate intolerance of variable severity with onset or first recognition during pregnancy. In fact pregnancy is a diabetogenic state characterized by increased insulin demand, resistance and increased production of diabetogenic hormones such as estrogen, progesterone, prolactin, HPL and cortisol. There has been an age old debate between universal screening and selective screening. Prevalence of GDM has constantly increased over the years, so universal screening is necessary.

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There are several criteria for diagnosis and screening. Eg ACOG recommends universal screening with 50 gm 1 hr loading test at 24 to 28 wks of gestation. If the value is more than 139 mg /dl perform a 100 gm OGTT on a separate day. If 2 values are found abnormal, patient is diagnosed as GDM. DIPSI recommends measuring of blood glucose after 2 hrs of administration of 75 gm glucose irrespective of the fasting status. Value ≥ 140 mg /dl is treated as GDM.

Aims and Objectives

- 1) To find out prevalence of GDM by 75 gm OGTT by DIPSI criteria.
- 2) To determine association of maternal and fetal outcome in GDM patients.
- 3) To compare the results of my study in light of the available literature.

Material and Methods

This study was conducted at Mahila Chikatsalya SMS Medical College and Hospital Jaipur during January 2018 to January 2019.

200 Pregnant women between 24 weeks to 28 weeks of period of gestation were screened for GDM by administering 75 gm oral glucose, irrespective of the fasting status and blood sugar was measured after 2 hrs. (DIPSI). This procedure was recommended by government of India as universal screening for GDM. If the blood glucose was more than or equal to 140 mg/dl, patient was diagnosed as GDM[13]. Patients having preconceptional diabetes mellitus and patients already on medication know to affect glucose tolerance were excluded. A complete history and examination of patient was done according to protocol and information was noted on predesigned proforma after taking informed consent.

Whole cohort was follow during antenatal period and up to 7 days after delivery for gestational hypertension,

preeclampsia, Polyhydramnios,UTI, duration of pregnancy, mode of delivery.

Neonates were followed for metabolic complications, hyperbilirubinemia, Macrosomia, respiratory distress, congenital malformations admission to neonatal unit for >24 hours. All analysis was performed using standard statistical methods as required during the study.

Statistical Analysis

Risk factors and fetomaternal outcome were analyzed using Chi square test for association and p value was calculated and p value <0.05 was taken as significant.

Observations and Results

16 patients out of 200 were found to test positive for GDM by 75 gm OGTT (DIPSI). So the prevalence of GDM in our study was 8%. In our study the prevalence of Gestational hypertension or preeclampsia or chronic hypertension was 62.50% in comparison to non diabetics(7.06%) and p value was significant <.001.(Table 1)

Table 1: Distribution of cases according to diabetic status and presence of Chronic hypertension/ Gestational Hypertension/ Preeclampsia

	Chronic hypertension, Gestational hypertension, Preeclampsia					
	Present		Absent		Total	
	NO.	%	NO.	%	NO.	%
GDM	10	62.50%	6	37.50%	16	100%
Non Diabetic	13	7.06%	171	92.93%	184	100%
Total	23	11.5%	177	88.5%	200	100%

P VALUE : <0.001(s)

CHI SQUARE TEST: 44.44

Polyhydramnios was also present in 12.5% patients in contrast to 1.63% in non-diabetics.

Table 2: Distribution of cases according to diabetic status and presence of Polyhydramnios

Diabetic status	Presence of Polyhydramnios					
	Present		Absent		Total	
	NO.	%	NO.	%	NO.	%
GDM	2	12.5%	14	87.50%	16	100
Non diabetic	3	1.63%	181	98.3%	184	100
Total	5	2.5%	195	97.5%	200	100

P Value : .02(S)

CHI square test: 7.13

Similarly presence of UTI, preterm birth was also significantly higher in GDM patients (Table 3, Table 4)

Table 3: Distribution of cases according to diabetic status and presence of UTI

Diabetic Status	Presence of UTIS					
	Present		Absent		Total	
	NO.	%	NO.	%	NO.	%
GDM	12	75	4	25	16	100%
Non diabetic status	23	12.5%	161	87.5%	184	100%
TOTAL	35	17.5%	165	82.5%	200	100%

P value : <0.001 (s)

Chi square test: 39.8

Table 4: Distribution of cases according to diabetic status and preterm /term delivery

Diabetic Status	Duration of pregnancy					
	Preterm		Term		Total	
	NO.	%	NO.	%	NO.	%
Gdm	8	50%	8	50%	16	100%
Non Diabetic Status	4	2.17%	180	97.82%	184	100%
Total	12	6%	188	94%	200	100%

P VALUE: <0.001 (S)

CHI SQUARE TEST: 59.6

In our study rate of LSCS was (50% vs15.76%) was significantly higher in GDM patients and indications were varied like preeclampsia with NPOL,fetal distress and macrosomia etc.

Table 5: Distribution of cases according to diabetic status and mode of delivery

	Mode of delivery					
	LSCS		Vaginal Delivery		Total	
	NO.	%	NO.	%	NO.	%
Diabetic status						
GDM	8	50%	8	50%	16	100
Non diabetic status	29	15.76%	155	84.23%	184	100
Total	37	18.5%	163	81.5%	200	100

P value : 0.007 (s)

Chi square test : 11.44

Our study also showed that there was a higher rate of metabolic complications, presence of respiratory distress and admission to neonatal unit for managing the above complications.

Table 6 :Distribution of cases according to maternal diabetic status and metabolic complications in baby

	Presence of metabolic complications					
	Present		Absent		Total	
	NO.	%	NO.	%	NO.	%
GDM	8	50%	8	50%	16	100%
Non Diabetic status	8	4.34%	176	95.65%	184	100%
TOTAL	16	8	184	92%	200	100%

P VALUE :<0.001(s)

Chi Square test : 41.68

Table 7:Distribution of cases according to Diabetic status and Respiratory distress in baby

	Presence of respiratory distress					
	Present		Absent		Total	
	NO.	%	NO.	%	NO.	%
GDM	8	50 %	8	50%	16	100
Non diabetic status	9	4.89%	175	95.4%	184	100
Total	17	8.5%	183	91.5%	200	100

P Value: <0.002 (s)

Chi square test : 38.5

Table 8 : Distribution of cases according to diabetic status and Macrosomia

	Presence of macrosomia					
	Present		Absent		Total	
	NO.	%	NO	%	NO.	%
Diabetic status						
GDM	4	25%	12	75%	16	100%
Non diabetic status	2	1.08%	182	91%	184	100%
Total	6	3%	194	97%	200	100%

P value : <0.003 (s)

Chi sq test :28.97

Table 9: Distribution of cases according to diabetic status and requirement of NICU >24 hours

	Requirement of admission in NICU >= 24 hours					
	Required		Not Required		TOTAL	
Diabetic status	NO.	%	NO.	%	NO.	%
GDM	10	62.5%	6	37.5%	16	100
Non diabetic status	10	5.434%	174	94.5%	184	100
Total	20	10%	180	90%	200	100

P value : <0.001 (s)

Chi sq test : 53.29

Discussion

The prevalence of GDM in India varies from 3.8 to 21% in different parts of the country depending on the geographical location and diagnostic methods used. In India it is difficult to predict any uniform prevalence because of wide difference in living conditions, socioeconomic status, dietary habits and maternal age[1].

Data regarding prevalence and fetomaternal outcome of GDM is important for national health planning, resource allocation and to undertake various preventive measures. The prevalence of GDM was 16.2% in Chennai, 15% in Thivantapuram, 17.5% in Ludhiana[2].

Studies also show that Asian people have higher risk of GDM compared to rest of the groups[3]. Caesarean section rate was higher in GDM patients (50% vs 15.76%). Malinowska et al[4]. (2001) and Frid et al(2001)[5] reported higher rates of caesarean section in GDM patients.

There was a significant association between gestational hypertension and diabetic status. Mohammad Shohaib Randhwa et al [6] (2003) also reported that overall complications were 56% with most common being preeclampsia followed by infections, polyhydramnios and eclampsia.

Ramirez Torres[7] (1999) also showed increased risk of UTI in patients with GDM in accordance with our results. In unison with our results Vinita Das, Smita Kamra et al[8] (2004) reported that preterm delivery was almost 4.5 times higher among GDM patients. Ramirez Torres also reported increased incidence of premature rupture of membranes.

Metabolic complications in neonates included hypoglycaemia, hypocalcaemia, polycythaemia, hyperbilirubinemia.

In our study significant association was found to all neonatal complications. There was no congenital anomaly found in babies of diabetic mother as the patients were screened, diagnosed and managed

timely. Hossein Nezhad et al[9] 2007 also showed prevalence of macrosomia, neonatal hypoglycaemia and hypocalcaemia was significantly higher in GDM patients. Boriboonhirunsarn D[10] et al also reported hypoglycaemia and macrosomia were common in GDM patients. Saydah Chandra, Eberhard et al[11] also concluded that women with GDM had more macrosomic babies. Seshiah et al[12] also declared that in Indian context screening is essential in all pregnant women as Indian women have 11 fold increased risk of developing GDM compared to Caucasian population.

Conclusion and recommendation

Despite years of meticulous research the prevalence of GDM continues to pose significant problems to obstetricians. These figures are a wake up call to place GDM at higher priority in our public health system. Universal screening is recommended for early recognition and efficient management to avert the above mentioned complications.

References

1. Reddy Mange Ke, Sailaja Lakshmi P et al. Prevalence of Gestational diabetes mellitus and perinatal outcome: a rural tertiary hospital based study. International journal of Reproduction, Contraception, Obstetrics and Gynecology 2017;6(8):3594 -3596
2. Seshiah V, Balaji V, Balaji MS et al. Gestational Diabetes Mellitus in India. JAPI 2004;52:707 - 711
3. Yue D K, Molyneaux ML et al. Why does ethnicity affect prevalence of gestational diabetes? The underwater volcano theory. Diabetic Medicine. 1996;13:748 -752.
4. Polubiec A, Malinowska et al: Pregnancy and delivery course in patients with GDM. Ginekolog Pol 2003 ;74 (10):1200-1207

5. Aberg Anders, Frid et al: Impaired glucose tolerance associated with adverse pregnancy outcome: a population based study in southern Sweden. American Journal of Obstet Gynaecol 2001;184:77-83
6. Randhawa Shoab Mohammad, Moin Saima Et al: Diabetes mellitus during pregnancy. A study of 50 cases Pakistan Journal of Medical Science 2003;19(4):277-282
7. M A Tores Ramirez: GDM experience at III level hospital. Diabetes Res. Clin. Pract 1999;44(1):21-26
8. Das Vinita, Kamra Smita et al Screening for gestational diabetes and maternal and fetal outcome. Obstet and Gynaec India 2004;54(5):449-45
9. A Nezhada Hossein et al: Prevalence of GDM and pregnancy outcome in Iranian women. Taiwan Journal of Obstet Gynecol 2007;46(3):236-241.
10. D Boriboonhirunsarn: Adverse pregnancy outcome in GDM. J. Med Association Thai., 2006; 89 Suppl 4: S23-S28.
11. Saydah Chandra and Eberhardt: Pregnancy experience among women with and without GDM in the U.S. 1995, National survey of family growth. Diabetes care 2005;28(5):1035-1040.
12. Seshiah, A K Das, V Balaji et al: GDM Guidelines JAPI Vol 2006; 54:622 to 628
13. NHM (2018) Diagnosis and Management of Gestational Diabetes Mellitus: Technical and operational guidelines (online) available from: http://nhm.gov.in/New_updates_2018/NHM_components/RMNCH_MH_Guidelines/Gestational-diabetes-mellitus.pdf (last accessed Sept 2019)

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