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Maternal and Fetal Outcome in Gestational Diabetes Mellitus in RIMS, Imphal

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ABSTRACT
This article aim is to Fetomaternal outcome of Gestational Diabetes Mellitus in RIMS, Imphal.
Material and method: *Cross sectional Study carried out in the Department of Obstetrics and Gynaecology, RIMS,Imphal, Manipur conducted for duration of two years beginning from Oct, 2019 to Sept, 2021 from 131 pregnant women who were diagnosed with GDM (by 75gOGCT according to DIPSI guidelines) attending antenatal clinic and admitted in antenatal ward.*
Result: *The results showed that among 131 cases, majority (32.1 %) belonged to the age group of 26 to 30 years. Several maternal complications Preeclampsia (27%) , Preterm labour (13.7%) were found to be increased. LSCS was also found to be increased (59.2%). There was increased association of LSCS with women who are undergoing treatment with insulin therapy (p<0.05). Majority of the study population was diagnosed at 34 to 36 weeks (48.9%) . Fetal and Neonatal complications like Congenital Anomalies (6.9%), IUFD (3.1%), Macrosomia (14.5%), were found to be increased. Macrosomia was seen in high association with women who were undergoing treatment with Insulin (p <0.05).*
Conclusion: *To conclude, based on the observations of this study, GDM is associated with adverse complications in both the mother and fetus. Most common maternal complication was preeclampsia 26.7% and LSCS rate (57.2 %) was higher as compared to normal delivery. Macrosomia (14.5%) were found to be increased. Macrosomia was seen in high association with women who were undergoing treatment with Insulin (p <0.05). Early detection and prompt management of this condition can tremendously reduce the short term and long term complications in both the mother and neonate.*
Keywords: *Gestational diabetes mellitus , macrosomia , LSCS*

I. INTRODUCTION

The prevalence gestational diabetis mellitus(GDM) in India ranges from 0.53% to as high as 27.3% with a mean prevalence 8.7%. Normal pregnancy is considered to be a diabetogenic state. There is three fold rise in serum cortisol and human placenta contains enzymes (eg.insulinase) that increase the degradations by

potentiating the secretion of insulin ,but in GDM the pancrease fail to respond adequately. GDM is associated with serious complications for both the mother and child, and adverse consequences on the fetus and the mother increases linearly with increasing maternal blood glucose level. It can also cause a wide range of complications as well as long term implications in both the mother and fetus.[1] This study was carried out to find the Fetomaternal outcome of Gestational Diabetes Mellitus in Regional Iinstitute of Medical Sciences, Imphal (RIMS).

II. METHODS

The study was carried out in the Department of Obstetrics and Gynaecology, RIMS,Imphal, Manipur for a duration of two years beginning from Oct, 2019 to Sept, 2021. Inclusion criteria were singleton Pregnant women beyond 28 weeks of gestation diagnosed with gestational diabetes mellitus (by OGCT according to DIPSI guidelines). Excluded from the study were patients with Chronic hypertension,Patients with pre-existing diabetes mellitus, Patients on medications that can alter the glucose metabolism like steroids,antipyschotics, diuretics,oral contraceptive pills,beta blockers, Patients with abnormal thyroid profile, Cushings syndrome, Chronic medical illness, Autoimmune disease, Period of gestation less than 28 weeks.
Sample size was calculated using the formula

$= \frac{4PQ}{L^2} = \frac{4x8.7x91.3}{5^2}$ (Prevalence of Gestational Diabetes Mellitus in India: A Systematic Review and Meta-analysis).[2]
$= \frac{3117}{25} = 125$

Adding Non response rate (5%) i.e 6
Total sampling size calculated is 125+6 = 131

Study population included 131 pregnant women who were diagnosed with GDM (by 75g Oral Glucose Cha;;enge Tests(OGTT) according to Diabetes in Pregnancy study group of India (DIPSI) guidelines attending antenatal clinic and admitted in antenatal ward. The patients with OGCT values of more than 140 mg/dl were included in the study. National guideline for diagnosis and management of Gestational Diabetes was used.

Irrespective of the last meal,75 gm glucose was given orally after dissolving in 300 ml of water whether the pregnant women comes in fasting or non-fasting state. The intake of the solution has to be completed within 5-10 minutes. A semi-autoanalyser/auto-analyser or plasma calibrated glucometer was used to evaluate blood sugar 2 hours after the oral glucose load. Following the National guidelines, universal screening of all pregnant women at first antenatal contact was done. If the first test is negative, second test was done at 24-28 weeks of gestation. If the first contact was after 28 weeks of gestation, 75 gm OGTT was done at the first point of contact at any period of gestation. The threshold value of 2-hour blood sugar (BS) was taken as >140 mg/dL .GDM Pregnant women was managed by Medical Nutrition Therapy (MNT), and insulin therapy/ metformin as required. All Pregnant women who test positive for GDM for the first time was started on Medical Nutrition Therapy (Meal Plan) and physical exercise for 2 weeks. The woman was adviced for walk/exercise for 30 mins a day. After 2 weeks on Meal plan and physical exercise, 2 hrs PPBS was be done. If 2hr PPBS is <120 mg/dL , Meal plan was continued and test was recommended to conduct at least once every month during 2nd and 3rd trimester. If 2hr PPBS is ≥120 mg/dL, medical management (metformin or insulin therapy) was started.

Informed written consent was taken .Detailed history and proper clinical examination was done with special attention to age, parity, signs and symptoms of UTI, Pre-eclampsia etc. Height, weight, and blood pressure were measured at each visit. These patients are followed up from antenatal period till six weeks postpartum. Fetomaternal complications and perinatal outcome are evaluated during the study period.

Ethical clearance was obtained from the Institutional Ethics committee of RIMS, Imphal (Ethics Reference No. A/206/REB-Comm(SP)/RIMS/2015/627/105/2019). Collected data was compiled and tabulated in the excel sheet. Statistical calculation was done using appropriate statistical methods using spss version 21.0.

III. RESULTS

Study population included 131 pregnant women who were diagnosed with GDM. The major population of the age group is between 26 to 30 years (32.1 %) as shown in table 1. Elderly Gravidas (36 to 40years) comprises of 6.1% and teenage pregnancy was encountered in 16 % of the study population as shown in table 1. Occurrence of GDM was lesser in extremes of age group . Lower incidence in older age group could be due to increase incidence of pregestational diabetes mellitus and were not included in the study.

Table 1- Demographic profile

Age	**Frequency, n = 131**	**Percent**
≤20	21	16.0
21-25	36	27.5
26-30	42	32.1
31-35	24	18.3
36-40	8	6.1
Gravida		
Primigravida	56	42.7
Multigravida	75	57.3
Gest. Age at diagnosis		
<34weeks	61	46.6
34-36weeks	64	48.9
>36weeks	6	4.6

Table 2 – Associated antenatal complications

Antenatal complications	**Frequency**	**Percent**
Pre-eclampsia	35	26.7
Polyhydramnios	34	26
Urinary tract infection	19	14.5
Preterm Labour	18	13.7
Premature rupture of membranes	10	7.6

Many patients had multiple complications. Main maternal complications were Polyhydramnios (26.0%), Preeclampsia (27%) , Preterm labour (13.7%) as shown in table 2.

Table 3 (a) – Mode of Delivery

Mode of delivery	**Frequency, n = 131**	**Percent**
ELECTIVE LSCS	48	38.6
EMERGENCY LSCS	27	20.6
INSTRUMENTAL	3	2.3
NORMAL VAGINAL DELIVERY	53	40.5

Table 3 (b) – Mode of Delivery

		Mode of Delivery				
		El LSCS	Em LSCS	Instrumental	Normal Vaginal delivery	
Treatment	Meal Plan	7	15	2	34	P<0.05
	Insulin	41	12	1	19	
	Total	48	27	3	53	

The study showed that LSCS rate (59.2%) was higher in comparison to Normal delivery as shown in table 3a and that there was increased association of LSCS with women who are undergoing treatment with insulin therapy (p<0.05) as shown in table 3b.

Table 4(a) – Birth weight

BIRTH WEIGHT	Frequency, n = 131	Percent
<2.5KG	17	13.0
2.5-3.5KG	62	47.3
3.6-4KG	33	25.2
>4KG	19	14.5

Table 4(b) – Birth weight with treatment

BIRTH WEIGHT						
		<2.5KG	2.5-3.5KG	3.6-4KG	>4KG	
	MEAL PLAN	10	27	19	2	
	INSULIN	7	35	14	17	P<0.05
TREATMENT	Total	17	62	33	19	

14.5 % of babies delivered were macrosomic as shown in table 4 a. Low birth weight were 13%. Macrosomia was seen in high association with women who were undergoing treatment with Insulin ($p < 0.05$) as shown in table 4b

Table 5 – Fetal Outcome

FETAL OUTCOME	Frequency	Percent
STILLBORN	5	3.9
LIVE BIRTH	126	96.1
BIRTH ASPHYXIA	15	11.5
SHOULDER DYSTOCIA	2	1.5
CONGENITAL ANOMALIES	9	6.9

Various Fetal and Neonatal complications like Congenital Anomalies (6.9%), IUFD (3.1%), Macrosomia (14.5%),Birth Asphyxia (11.9%) were identified . Shoulder dystocia was seen in 1.5% (n=2) of cases and both cases were from women with GDM on insulin therapy.

IV. DISCUSSION:

GDM has been diagnosed as a clinical entity for the past 50 years. Early studies have strongly indicated untreated carbohydrate intolerance during pregnancy is associated with higher rates of maternal mortality and morbidity. The purpose of screening , treatment and management of GDM is to prevent still birth, congenital anomalies, pre eclampsia , intra uterine death and decrease the incidence of macrosomic babies and cesarean section rates thereby reducing maternal and perinatal morbidity and mortality. The findings of the present study confirmed that GDM patients are liable to have adverse pregnancy outcomes. Kumari SS et al[3] reported that the most common age group was between 25 to 30 years with 50% cases. Ismail NA[4] et al reported the maximum mean maternal age of GDM in their study was 27.9 years. In this study ,the maximum incidence of GDM occurred between 26 to 30 years of age (32.1%) The increasing incidence was seen in higher parity which was also reported by Farook et al[5]. In this study similar findings were observed (57.3 % in multigravida and 42.7 % in primigravidas).The increased prevalence may be because of undiagnosed glucose intolerance in previous pregnancies and detected in the index pregnancy. Also, with increasing number of pregnancies, the stress on Beta cells increase so does the insulin resistance, hence the incidence of GDM rises with parity. The maximum number of GDM cases were detected between 34 and 36 weeks of gestation (48.9%),which can be attributed to the fact that the maximum insulin resistance occurs at this age group. Poor glucose control predisposes women to develop complications for both mother and the fetus.

Glucose should be regulated as strictly as possible. Bhat M al[4], cites a 14.7% incidence of polyhydramnios v/s 2.7% in controls. MakwanaM etal[8] cited that the incidence of polyhydramnios in GDM group was 21.05% which was far higher than the 3.88% in non GDM group . In this study, Polyhydramnios was seen in 26% of cases. In this study, 26.7 % of GDM mothers had associated pre eclampsia complicating pregnancy. Dudhwadkar AR et al[9] studied the fetomaternal outcomes in GDM and found that preeclampsia complicating pregnancy was found in 26 % of GDM mothers. In this study preterm labour was encountered in 13.7 % of the population, PROM in 7.6% and Pre eclampsia in 26.7% of cases. Chanu MM et al[6] observed increasing frequency of preterm labour (16.39%) and polyhydramnios (18%) in GDM patients. Kumari SS et al[3] studied that the incidence of pre eclampsia in GDM was 21.42% and PROM was 13.09 %.

Many studies have found high caesarean delivery rates in GDM patients despite good maternal blood glucose control during pregnancy. Chanu MM et al[5],Saxena P et al[6]and Shukla A et al[7] studied that caesarean section rates was higher in women with GDM 52.5% , 42% and 40% respectively . In this study, the incidence of caesarean section was higher (59.2 %) when compared to normal delivery (41.8%).

As far as the fetal complications were concerened congenital anomalies were encountered in 6.9% of the study population, while according to DudhwadkarAR et al[13] 8% had congenital anomalies and Chanu MM et al[7]3.27% of congenital anomalies. Shukla A et al[11] studied that macrosomia was found in 14% of cases. The incidence of macrosomia was 14.5% in this study whereas higher incidence was noted in the other studies (40% in study by Dudhwadkar AR et al[11] and 23 % in study by Chanu MM et al[7]). Adverse fetal outcome (still born, intrauterine death) was seen in 3.7% of the study population and birth asphyxia in 11.9 %. Shoulder dystocia was seen only in 1.5% of the study population.

V. CONCLUSION:

To conclude, based on the observations of this study, GDM is associated with adverse complications in both the mother and fetus. Most common maternal complication was preeclampsia 26.7% and LSCS rate (57.2 %) was higher as compared to normal delivery. Macrosomia (14.5%) were found to be increased. Macrosomia was seen in high association with women who were undergoing treatment with Insulin ($p < 0.05$).

Early detection and prompt management of this condition can tremendously reduce the short term and long term complications in both the mother and neonate

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