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Fetomaternal Outcome in Patients with Gestational Diabetes Mellitus

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ABSTRACT: Background:GDM is defined as carbohydrate intolerance of variable severity with onset or first recognition during pregnancy (ACOG,2017a)[1].GDM is associated with increased incidence of feto-maternal morbidity as well as long term complications in both mother and babies. Undiagnosed or inadequately treated GDM leads to significant maternal and fetal complications. The study was conducted to review feto-maternal outcome in pregnancy with gestational diabetes mellitus.

Method:A prospective study was conducted from October 2019 to September 2020. Study group used single step 75g oral glucose tolerance test(OGTT) recommended by WHO for GDM diagnosis. Women diagnosed with GDM were studied for feto-maternal outcome due to GDM.

Results: The maximum incidence of GDM occurred between 26 to 30 years of age. The incidence of GDM was seen in higher parity which was 60% in multigravida and 40% in primi gravida. Most common association in this patient was hypertension (30%). Rate of caesarean section (54%) was more common. Macrosomia (>4kg) was seen in 10% babies. Shoulder dystocia in 2%, congenital anomaly in 5%, intrauterine death in 2%, preterm delivery in 12% and admission to NICU were also common.

Conclusions: There was significant fetomaternal morbidity in patients with gestational diabetes mellitus. Early diagnosis and treatment reduces the fetomaternal outcome.

Keywords: Gestational diabetes mellitus, feto-maternal outcome, Oral glucose tolerance test, Macrosomia

I. INTRODUCTION

Gestational diabetes mellitus (GDM)is defined as carbohydrate intolerance of variable severity with onset or first recognition during pregnancy (ACOG,2017a).[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 progressive rise in the levels of estrogen,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]

GDM is associated with increased incidence of feto maternal morbidity as well as long term complications in both mother and babies .American college of obstetrics and gynecologist (ACOG) advocated selective screening for patients with high risk factors such as history of diabetes, member of an ethnic group with high prevalence of GDM, maternal age more than 25 year, obesity, persistent glycosuria, macrosomia, PCOS and significant past obstetric history.[3]

Undiagnosed or inadequately treated GDM leads to significant maternal and fetal complications. Fetal complications likely to develop are: Macrosomia, IUD, Malformation includes anencephaly, spina bifid, transposition, of great vessels, VSD, Renal agenesis, caudal regression syndrome, RDS, hyperglycemia, hypothermia, hyperbilirubinemia, hypocalcemia, and hyper viscosity.[4]Maternal complications include: Antenatal complications like abortion, pre-eclampsia, infection, polyhydramnios, maternal distress due polyhydramnios and obesity. Intrapartum complications like prolonged labor due

to to big baby, shoulder dystocia, PPH, increased incidence of caesarean section. Postpartum complications like puerperal sepsis, increased maternal morbidity, diabetic retinopathy, diabetic nephropathy, diabetic ketoacidosis.
Improved outcome depends on early diagnosis and good glycemic control.[5]

II. METHODS

A prospective study was conducted at a tertiary care center (civilhospital,Jamnagar) over a period from October 2019 to September 2020. 100 patients with gestational diabetes mellitus were studied for feto-maternal outcome. Informed consent was taken from all patients. Detailed history was taken including age, history of pregnancy loss or history of still birth, family history of diabetes and obstetric history. Detailed examination was done. Various parameters noted were mode of delivery, fetal weight, maternal and neonatal complications and neonatal intensive care admission.

INCLUSION CRITERIA
Patients diagnosed with gestational diabetes mellitus (by 75g OGTT)

III. RESULTS

In this study diagnosis of GDM was done by 75g OGTT. Glucose dissolving in 300 ml water given orally irrespective of last meal and measuring plasma glucose 2 hours after ingestion. It is considered positive if 2 hours plasma glucose is >140 mg/dl. Once the woman is diagnosed having GDM was managed as per guideline and continued testing for glycemic control and diabetic complications were done for the rest of pregnancy. Data was collected, studied and analysed.
Statistical analysis of 100 women with GDM was done, among themmaximum population of GDM patient came under the age group of 26-30 year(48%).
Majority of the study population delivered via lower segment caesarean section (54%)out of which 25(25%) has elective LSCS and 29(29%) had emergency LSCS.The most common indication for emergency LSCS were

- Failed induction -10(50%)
- Meconium stained liquor-4 (20%)
- Fetal distress-5(25%)
- Cephalopelvic disproportion in labor-5(25%)

The indications for elective LSCS included

- Macrosomia
- Previous LSCS

46% of the population delivered vaginally out of which 41% delivered naturally and 5% via instrumental delivery.The most common indication for instrumental delivery was large baby with birth weight more than 3.5 kg.

Table 1 : MODE OF DELIVERY

Mode of delivery	Frequency	Percent
LSCS	54	54
NATURAL LABOUR	41	41
INSTRUMENTAL	5	5
TOTAL	100	100

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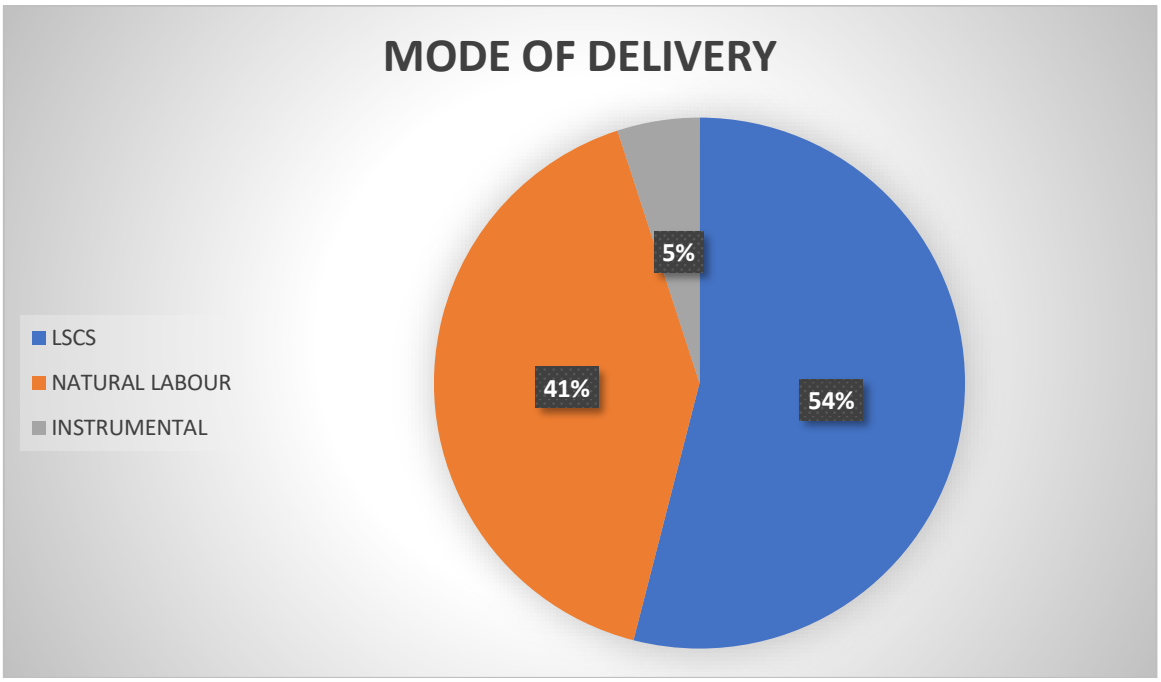

Figure 1: mode of delivery

Out of 100 women, GDM seen in primi gravida was 40% and multigravida 60%. Out of 100 women 30 women had pre eclampsia (30%). Polyhydramnios seen in 18% women. Preterm labour was seen in 12% women. Post partum hemorrhage was seen in 3% cases and wound gap occurred in 7% cases.

Most of the babies born to GDM mothers had weight ranging from 2.5-3.5 kg(40%). 19% of babies were low birth weight(n=19).Of these 19 babies 12 were preterm. 31 babies weight were between 3.6-4 kg.

Macrosomia(>4 kg)was seen in 10% of babies(n=10).

Birth truma and shoulder dystocia was seen in 2 babies.

Table 2 BIRTH WEIGHT

BIRTH WEIGHT	FREQUENCY	PERCENT
<2.5	19	19
2.5-3.5	40	40
3.6-4	31	31
>4	10	10
TOTAL	100	100

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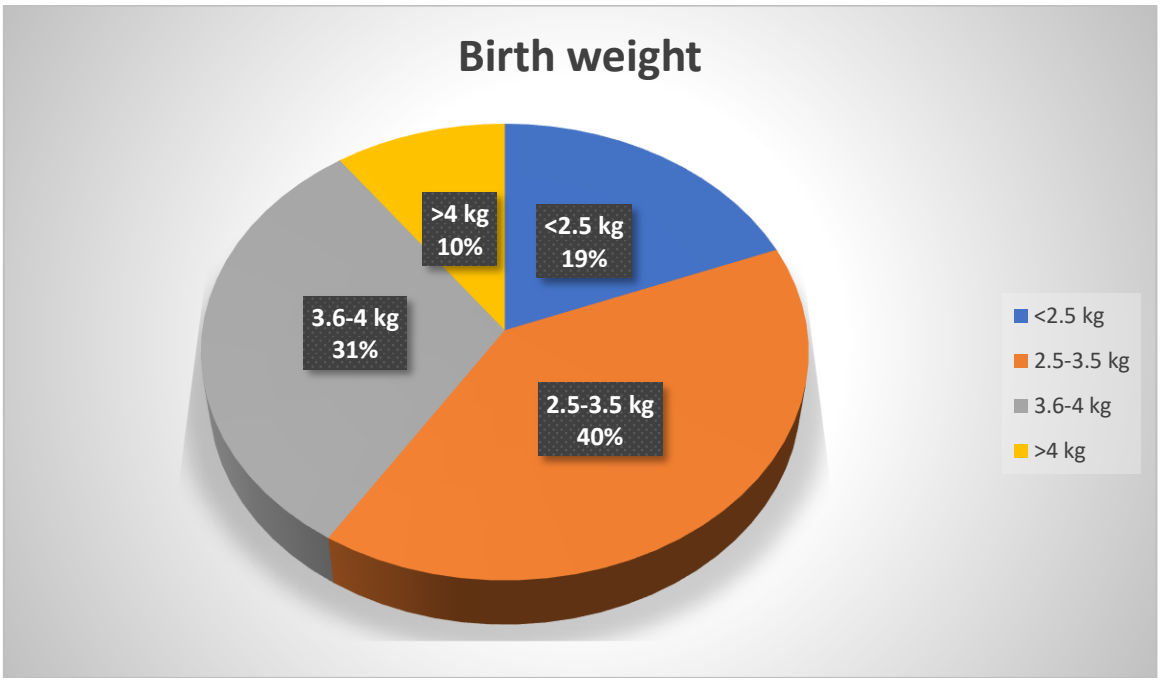

Figure 2 Birth weight

Intrauterine death occurs in 2% cases, congenital anomaly seen in 5% and NICU admission seen in 20% babies, common causes of NICU admission were prematurity, hyperbilirubinemia, respiratory distress and hypoglycemia.

IV. DISCUSSION

GDM has been diagnosed as a clinical entity for past 50 years.Early studied 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 incidence of macrosomic babies and caesarean section rates thereby reducing maternal and perinatal morbidity and mortality.The finding of the present study confirmed that GDM patients are liable to have adverse pregnancy outcomes.

The maximum incidence of GDM occurred between 26 to 30 years of age.Ismail NA et reported the maximum mean maternal age of GDM in their study was 27.9 years[6].

The incidence of GDM was seen in higher parity which was 42.2% reported by Serrirat et al[7].Rajput et al study also showed that higher parity would have a higher rate of GDM[8].In this study similar finding were observed 60% in multigravida and 40% in primi gravida.

Mutummatouleidi[9] et al studied that caesarean section rates was higher in women with GDM (52%).In this study,the incidence of caesarean section was higher(54%)when compared to natural labour (41%)

Ameya R et al[10] studied the feto maternal outcome in GDM and found that pre eclampsia complicating pregnancy was found in 26% of GDM mothers.In this study also,30% of GDM mothers had associated GDM complicating pregnancy.

Mutummatouleidi et al 9 observed increasing frequency of pre term labour and polyhydramnios in GDM patients .Polyhydramnios was found in 18% of our patients in this study.The study by Bhar et al,cites a 14.7% incidence of polyhydramnios in patients with GDM.[11]

Pre eclampsia can complicate the course of pregnancy and has an adverse effect on the feto maternal outcome .In this study 30% of GDM patients had associated pre eclampsia .In the study be Saxena et al,the incidence of pre eclampsia was 40%[12].According to Xiong et al,mothers with GDM were at increased risk of presenting with pre eclampsia[13].Thus there is an association between pre eclampsia and GDM and early diagnosis and initiation of treatment should be done to improve the outcome.

In the present study,12 % of babies were born preterm and 88% were term. A study by Mahalakshmi MM et al, in south india,77.5% of babies were term live births while 19% were

preterm live birth [14].Preterm birth in present study were attributed to premature labour and early induction in case of severe pre eclampsia.

Macrosomia and perinatal mortality are considered as adverse pregnancy outcomes in patients outcomes in patients with GDM. 2% babies were intrauterine deaths in present study similar to 6% intrauterine death reported in study by Saxena et al.[12] Macrosomia or babies weighing >4 kg at birth in GDM,was noted in 10% of study group.This observation comparable to the observation of Wahi p et al and Bener AB et al where macrosomia was seen in 16.2% and 10.3% respectively.[15,16]

Complications noted in neonates born to GDM mothers include foetal macrosomia, impaired foetal growth, and congenital anomalies. In present study, 5% had congenital anomalies. According to Shefali et al[17], 1.4% babies had congenital anomalies, while according to Saxena et al, 10% babies had congenital anomalies.[12]

V. CONCLUSION

GDM is a disease entitled that adversely affects maternal and fetaloutcome. Timely screening of all pregnant women for glucose intolerance achieving euglycemia in them and ensuring adequate nutrition can reduce adverse fetomaternal outcome and promote healthy families.Once patient diagnosed with GDM,appropriate glycemic control either via insulin,metformin or meal plan alone has to be achieved for good pregnancy outcome and to prevent the complications.

In this study most common cases of GDM detected between 26-30 yrs of age group, more in multigravida then primi.Antepartum complications included polyhydramnios ,pre eclampsia and preterm labour. Regarding mode of delivery 54% women were delivered by caesarean section.

In view of fetal outcome in present study 2% babies were IUD. Neonatal macrosomia found in 10% cases.Neonatal complications found were hypoglycaemia and hyperbilirubinemia..Birth trauma and shoulder dystocia was seen in 2 babies.congenital anomaly seen in 5% and NICU admission seen in 20% babies, common causes of NICU admission were prematurity, hyperbilirubinemia, respiratory distress and hypoglycemia.

GDM is a condition that should be treated aggressively and it is a problem that affects a significant number of women during pregnancy.Regardless of risk factors,early screening for gestational diabetes mellitus is strictly recommended.

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