



## MATERNAL AND PERINATAL OUTCOME IN GESTATIONAL DIABETES MELLITUS (GDM) : AN OBSERVATIONAL STUDY

### Gynaecology

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### ABSTRACT

**Background:** Gestational diabetes mellitus is carbohydrate intolerance of variable severity with onset or first recognition during pregnancy. Indian women are considered to be a high-risk population for developing gestational diabetes mellitus. GDM contributes to several maternal and fetal complications.

**Aim:** To study the maternal and perinatal outcome in women diagnosed with GDM.

**Objective:** This study was undertaken to study the maternal and fetal outcome in pregnancy with GDM and to assess the NICU admission of infants of GDM mothers.

**Materials and Methods: Methods:** The study consisted of 50 pregnant women with GDM admitted for delivery at ASRAM hospital, ELURU.

**Results:** Out of 50 patients, 40% had premature labour, while 16% had associated Hypertensive disorders in pregnancy. 12% had IUFD. 68% of the patients delivered by LSCS. A total of 66% of the babies were admitted to NICU. The fetal complications included 34% hypoglycemia, RDS in 20%, TTNB in 31%, 48% had jaundice, 1 baby had a congenital anomaly. Neonatal mortality occurred in 2 babies.

**Abbreviations :** GDM= Gestational Diabetes Mellitus , NICU =Neonatal Intensive Care unit, RDS = Respiratory Distress Syndrome, TTNB = Transient Tachypnea of Newborn, IUFD = Intra Uterine Fetal Demise, LSCS = Lower Segment Caesarean Section .

**Conclusion:** Diabetes mellitus is one of the most common endocrine disorder found during pregnancy. It is associated with various maternal and fetal complications. Hence the need for early diagnosis and treatment.

The neonatal complications like hypoglycemia, RDS, TTNB, hyperbilirubinemia, low Apgar are increased in babies of GDM mothers.

Most of the babies need NICU care for observation up to 48-72 hours or in view of the morbidity.

Good glycemic control in GDM cases decreases both maternal and fetal morbidity.

### KEYWORDS

Gestational diabetes mellitus, GDM , morbidity in gestational diabetes.

### INTRODUCTION

The Indian population, especially, South Indians, are considered high risk for developing diabetes. Diabetes mellitus constitute a group of metabolic disorders that shares the phenotype of hyperglycemia, due to defects in insulin secretion, insulin action, or both influenced by the complex interaction of genetics, environmental and lifestyle factors.<sup>1</sup> There is a progressive increase in the incidence of diabetes mellitus all over the world and is expected to increase by 165% by 2050<sup>2</sup>.

Gestational diabetes mellitus is defined as carbohydrate intolerance of variable severity with onset or first recognition during pregnancy; irrespective of treatment with insulin or not.<sup>3</sup> Pregnancy is a diabetogenic state characterized by insulin resistance. Basal metabolic rate does not change much till the initial 20 weeks of pregnancy but rises exponentially over the pre-pregnancy baseline during the second half of pregnancy<sup>3</sup>. These changes can be divided into those occurring in early (1-20 weeks) and late (21-40 weeks) pregnancy<sup>4</sup>.

In early pregnancy, there is enhanced first phase insulin release, normal or slight increased peripheral insulin sensitivity, normal or slightly enhanced glucose tolerance, and maternal fat accumulation<sup>4</sup>. In late pregnancy, there is insulin resistance and accelerated starvation<sup>4</sup>. Diabetogenic hormones such as human placental lactogen, estrogen, progesterone, cortisol, and growth hormone cause insulin resistance<sup>3</sup>. There is an 80% decrease in peripheral insulin sensitivity.<sup>2</sup>

Blood glucose levels in the fetus reflect the maternal glucose levels because of facilitated diffusion through the placenta, but this diffusion becomes almost negligible once the maternal glucose level crosses 200mg/dl. Unlike glucose, insulin is not transported from mother to fetus, and the fetus begins to produce insulin from the late first trimester. This insulin production in normal pregnancy is less and does not increase the risk of a fetal anomaly is not increased in gestational diabetes, unlike pregestational diabetes mellitus<sup>5</sup>.

Maternal complications include Gestational hypertension , preeclampsia , diabetic nephropathy , diabetic neuropathy , diabetic ketoacidosis and infections like candidal vulvovaginitis , respiratory tract infections and puerperal sepsis. Maternal complications also include postoperative wound complications following caesarean delivery<sup>7</sup>.

Fetal complications include spontaneous abortion, macrosomia, preterm delivery, shoulder dystocia, birth trauma, polyhydramnios and sudden intrauterine fetal demise<sup>2</sup>. Neonatal complications include Respiratory distress syndrome(RDS) , hypoglycaemia , hypocalcemia , hyperbilirubinemia, polycythemia, long term complication include inheritance of diabetes.

Early recognition and specific treatment of gestational diabetes mellitus in the form of diet or insulin or both decreases the incidence of maternal and fetal complications.<sup>4</sup> Hence, this study was done.

### AIMS AND OBJECTIVES

1. To study the maternal and neonatal outcome in pregnancy with Gestational diabetes mellitus.
2. To calculate the incidence of NICU admission in infants of GDM mothers.

### MATERIALS AND METHODS

This was an observational study done in the Department of Obstetrics and Gynecology at Alluri Sitarama Raju Academy of Medical Sciences, Eluru from June 2018 to June 2019. The sample size was 50 patients of GDM diagnosed either in our hospital or referred from elsewhere and delivered in our hospital.

### INCLUSION CRITERIA

1. All pregnant women between 24- 30 weeks of gestation.
2. 50 cases of GDM diagnosed either in our hospital or referred from elsewhere, delivered in our hospital.

### EXCLUSION CRITERIA

1. Patients with overt DM
2. Patients with other coexisting medical conditions.

### METHOD OF COLLECTION OF DATA

All pregnant women between 24-28 weeks of gestation were screened for GDM by oral glucose tolerance test (GTT). Women with high-risk factors were screened at the 1<sup>st</sup> visit, and if found normal, the procedure was repeated at 24-28 weeks.

TIME	IADPSG CRITERIA
Fasting	>= 92mg/dl
1-hour	>= 180mg/dl
2-hour	>= 153mg/dl

In this study, 75-g OGTT was done. The values obtained were compared with that of the International Association of Diabetes and Pregnancy Study Groups (IADPSG) standard, and GDM was diagnosed if any one or more values were abnormal. TIME IADPSG CRITERIA Fasting >= 92mg/dl 1-hour >= 180mg/dl 2-hour >= 153mg/dl

TABLE 1: The GDM patients were advised moderate exercises. They were counselled for dietary modifications initially. Blood glucose levels were rechecked after two weeks of dietary modifications. Patients with good glycemic control were asked to continue with the same, while others with poor glycemic control were admitted and started with OHA or Insulin; doses were titrated. The patients diagnosed as GDM were called for frequent antenatal check-ups.

Labour was induced at 40 weeks in cases with good glycemic control. Those cases complicated by uncontrolled blood sugars, PIH, IUGR were induced early. Corticosteroid prophylaxis was given in cases of preterm delivery. LSCS was done for obstetric indications.

All newborn babies were attended by the Pediatrician. The neonate was watched for complications like hypoglycemia (serum glucose level less than 40mg/dl at term), hyperbilirubinemia (serum bilirubin level >12mg/dl), respiratory distress syndrome (RDS), hypocalcemia (<7mg/dl), polycythemia (venous hematocrit >65%). All patients were asked to get OGTT done 6 weeks after delivery.

**RESULTS AND DISCUSSION**

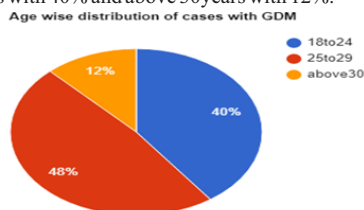
The collected data has been compiled in the following formats.

- 29 (58%) of cases were booked cases and 21 (42%) were unbooked cases in our hospital.

**2. FIGURE 1 :**

The age distribution of data collected was as follows :

The mean age of incidence was 25-29 years of about 48 %, followed by 18 to 24 years with 40% and above 30 years with 12%.



**3 Table 1 :**

PARITY	NUMBER	PERCENTAGE
Primi	14	28
G2	21	42
G3	12	24
>=G4	3	6

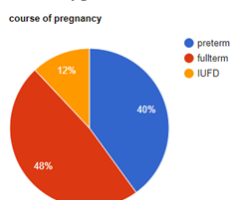
Parity wise distribution of cases. 14 cases out of 50 were primigravida. The incidence is highest with multigravida with 42% with gravida 2, 24% incidence with gravida 3 and 6%, incidence with >= Gravida 4.

- 52% of the patients were on diet & exercises, while 4% received OHA and 44% were on insulin therapy.

**5. FIGURE 2 :**

48% of the cases delivered at term. Incidence of preterm labour was as high as 40%. 6 cases (12%) had IUFD.

16% of cases had associated hypertensive disorders in pregnancy.



- 34 (68%) of them delivered by LSCS. 2 (4%) cases delivered with instrumentation. 23% of cases had previous LSCS (either one or two). In 12% for indication for LSCS was failed induction and in 47% of cases indication for cesarean section was fetal distress, and in 17% for other variable indications.
- There were no cases of birth trauma.

**8. Table 2 : Distribution of cases according to birthweights.**

Birth weight	Number	Percentage
SGA	8	18
AGA	24	55
LGA	10	22
Macrosomia	2	5

- APGAR was normal in 38 babies, moderately depressed in 6 newborn babies.
- Among the live births, 29 (66%) babies born to GDM mother were admitted in NICU for various indications.
- Among the 29 NICU admissions, 9 (31%) babies were admitted due to TTNB, 6 (20%) babies were admitted for RDS, 3 (10%) babies for MAS, 10 (34%) babies had hypoglycemia, 1 baby had congenital cardiac anomaly.
- No maternal mortality was seen. Neonatal mortality occurred in 2 babies (4%) both were due to respiratory failure.
- The postnatal blood sugar (FBS/PPBS/RBS) of all the patients was normal within 4 to 5 days.
- None of the patients required insulin at discharge.

**CONCLUSION:**

Diabetes mellitus is one of the most common endocrine disorder found during pregnancy. It is associated with various maternal and fetal complications if untreated.

Early diagnosis and good glycemic control reduces both maternal and fetal complications in GDM.

The present study shows that the highest incidence of GDM occurs between 25 to 29 years age group and that most of the cases can be managed with diet & exercises as the first line of therapy. The study also shows that Hypertensive disorders in pregnancy are the most common association with GDM. The study confirms the increased rate of LSCS in GDM cases (more than 60%), the indications being not only GDM but also the associated risk factors like fetal distress and associated severe preeclampsia.

The neonatal complications like hypoglycemia, RDS, TTNB, hyperbilirubinemia, low Apgar are increased in babies of GDM mothers.

Most of the babies need NICU care either for the morbidity or for observation up to 48-72 hours. Large for gestation babies are common in GDM cases.

Good glycemic control in GDM cases decreases both maternal and fetal morbidity.

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