

## A Study Of Maternal And Fetal Outcomes In Gestational Diabetes Mellitus

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### Abstract

#### Aim:

- To study maternal and fetal outcomes in patients with gestational diabetes mellitus

#### Objectives:

- To study the maternal outcome in terms of mode of delivery, antepartum, Intrapartum and post-partum complications
- To study fetal outcome in terms of maturity, birth weight, presence of congenital anomalies, and neonatal complications in cases of gestational diabetes.

**Materials and Methods:** In this prospective observational study we included 30 patients with gestational diabetes mellitus and were studied for fetomaternal outcome. **Results:** In this present study 30 cases of gestational diabetes mellitus were studied. It was observed that gestational diabetes mellitus maximum among patients belonged to age group 26-30 years (33%), maximum seen among multigravida patients (56%). 50% cases delivered by caesarean section, maternal complications like preeclampsia (8 cases), polyhydramnios (13 cases), uteroplacental insufficiency (3 cases), macrosomia (5 cases), intrauterine fetal death (1 case). 6 neonates developed respiratory distress syndrome, 10 developed hypoglycemia, and 11 neonates required NICU admission. **Conclusion:** Gestational diabetes mellitus poses short term as well as long term effects on the health of both mother and the child. Therefore all antenatal women attending the OPD should be offered universal screening for GDM. Early diagnosis and treatment of gestational diabetes with adequate antenatal care, timely referral, management of the identified cases are essential to reduce the adverse maternal and neonatal outcomes.

**Keywords:** Gestational diabetes mellitus, Maternal and fetal complications associated with gestational diabetes mellitus

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### Introduction

Gestational diabetes mellitus (GDM) is defined as "Any degree of glucose intolerance that either commences or is first diagnosed in pregnancy."<sup>1</sup> According to the American diabetes association (ADA), GDM complicates approximately 7% of all pregnancies, whereas its total incidence is estimated up to 17.8% depending upon the ethnic and clinical characteristics of the population and diagnostic tests employed.<sup>2</sup>

Increasing maternal age, overweight, increasing parity and a family history of diabetes are all risk factors for gestational diabetes

The incidence of GDM is increasing reflecting increasing prevalence of obesity and metabolic syndrome<sup>1</sup>

Pregnancy is a diabetogenic state where there is certain physiological maladaptation in the regulation of carbohydrate metabolism in pregnancy that turns out to be pathological, contributing to the onset and progression of the condition.

The diabetogenic effects of pregnancy include insulin resistance, increased lipolysis

Insulin resistance develops because of production of human placental lactogen, Increased production of cortisol, estriol, progesterone, increased insulin destruction by kidney and placenta

Many of these hormones are insulin antagonists, causing insulin

resistance in the mother and cause abnormal glucose tolerance in some women rendering them to develop gestational diabetes

During early pregnancy, glucose crosses the placenta to the fetus by facilitated diffusion resulting in the decrease in fasting blood glucose to 50-65 mg%. As pregnancy progresses 3 factors are responsible for causing post prandial hyperglycemia: insulin antagonists such as estrogen, progesterone, and human placental lactogen.

The maternal complications in patients with GDM are preeclampsia, polyhydramnios, preterm labor, PPRM, DKA, urinary tract infections, postpartum hemorrhage (PPH), sepsis

The fetal complications are preterm baby, low birth weight, intrauterine death, congenital malformation, respiratory distress syndrome, hypoglycemia, hyperbilirubinemia, IUD, still birth, neonatal death.

### Materials and Methods

Current study design was prospective observational study in which total 30 patients were studied during the period of September 2020 to September 2021 in department of obstetrics and gynaecology at Alluri Sitarama Raju Academy of Medical sciences, Eluru. All the antenatal cases having gestational diabetes mellitus either previously diagnosed or diagnosed during antenatal visits by screening method of DIPSI (diabetes in pregnancy study group of India) were analysed.

### Inclusion Criteria

- Singleton pregnancies
- Pregnant women diagnosed of gestational diabetes mellitus first time during pregnancy irrespective of gestational age

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**Exclusion Criteria**

- Patients with pregestational or overt diabetes
- Patients on medications that can alter the glucose metabolism like steroids, antipsychotics, beta blockers
- Patients with abnormal thyroid profile
- Multiple pregnancy

**DIPSI Guidelines** (Diabetes in Pregnancy Study group of India)

- One step method
- Irrespective of Fasting
  - For better compliance in low resource settings.
  - 75 gms glucose – 2 hrs sample ( plasma)

**Table 1:** DIPSI guidelines

PBG (mg/dl)	Inference
≥140	GDM

- History was taken, general physical and systemic examination were done. The fetal well-being was assessed throughout pregnancy through various methods like maternal weight gain, serial ultrasound sound scans, DFMC, NST
- Maintain euglycemic control by medical nutrition therapy or insulin
- These patients are followed up throughout antenatal period till

- delivery.
- Any maternal comorbidities, antenatal complications, mode of delivery, intrapartum and post partum complications, neonatal outcomes associated with the cases were noted.

**Results**

Total 30 patients with gestational diabetes mellitus were included.

**Table 2:** Age Distribution

Age	Number	Percentage
<20 years	4	13
21-25 years	8	27
26-30 years	10	33
31-35 years	6	20
36-40 years	2	7

In this study, the maximum GDM patients belonged to age group 26-30 years(33%), 7% belonged to >36 years

**Table 3:** Mode of Delivery

Mode of delivery	Number	Percentage
Caesarean delivery	15	50
Normal delivery	13	44
Instrumental delivery	2	6

50% of the study population delivered via caesarean section. 44% delivered vaginally and 6% via instrumental delivery.

**Table 4:** Parity of Study Population

Parity	Number	Percentage
Primi	13	44
Multi	17	56

Among 30 women, 44% were primi gravida and 56% were multigravida

**Table 5:** Gestational Age at Diagnosis

Gestational age at diagnosis	Number	Percentage
<20 weeks	1	3
20-28 weeks	3	10
28-34 weeks	8	26
34-36 weeks	16	54
>36 weeks	2	7

The occurrence of GDM maximum at 34-36 weeks of gestational with 54%. 3% at <20 weeks, 10% at 20-28 weeks and 7% at > 36 weeks

**Table 6:** Maternal Complications in GDM

Maternal complication	Number	Percentage
Polyhydramnios	13	44
Preeclampsia	8	26
Uteroplacental insufficiency	3	10
Preterm labour	3	10
Prelabour rupture of membranes	3	9
Urinary tract infection	4	13
Postpartum hemorrhage	2	6

Among 30 GDM patients, 13 (44%) patients developed polyhydramnios, 8(26%) developed preeclampsia, 3 (10%) had uteroplacental insufficiency, 3(9%) had prelabour rupture of membranes, 3(10%) underwent preterm labour, 4(13%) had UTI, 2(6%) had postpartum hemorrhage

**Table 7: Fetal Complications in Gestational Diabetes Mellitus**

Fetal complication	Number	Percentage
Intrauterine fetal death	1	3
Prematurity	4	13
Macrosomia	5	16
Respiratory distress syndrome	6	20
Hypoglycemia	10	33
Congenital anomalies	1	3
Shoulder dystocia	1	2
NICU admission	11	36

In this study, 1 (3%) patient had intrauterine fetal death, 4 (13%) were premature, 5 (16%) were macrosomia, 6 (20%) developed respiratory distress syndrome, 10 (33%) developed hypoglycemia, congenital anomalies noted in 1 (3%) patient, shoulder dystocia in 1(2%) patient and 11 (36%) had NICU admission.

### Discussion

Gestational diabetes mellitus is one of the common medical disorders seen in pregnancy. Previous studies have shown that carbohydrate intolerance during pregnancy is associated with higher rates of maternal and fetal complications.

The maximum incidence of GDM occurred between 26 to 30 years of age (33%). Ismail NA et al reported the maximum mean maternal age of GDM in their study was 27.9 years.

Study was compared to study of Thomas et al and it was observed that incidence of gestational diabetes mellitus was 47.7% in primi patients and 50.3% in multipara in a study by Thomas et al.

The maximum number of GDM cases were between 34 and 36 weeks of gestation (54%), which can be attributed to the fact that the maximum insulin resistance occurs at this age which was also reinforced by Peraldi et al.

Ameya R et al studied the fetomaternal outcomes in GDM and found that preeclampsia complicating pregnancy was found in 26 % of GDM mothers. In this study also, 26 % of GDM mothers had associated GDM complicating pregnancy.

Incidence of polyhydramnios was 44% in cases of gestational diabetes mellitus and it was comparable with the study by Jindal et al in which 44% women with GDM had polyhydramnios

Krishnamoorthy et al studied that the incidence of preterm labor and PROM was 9 % and 8 % respectively. In this study preterm labour was encountered in 10 % of the population and PROM in 9%.

In this study, Macrosomia noted in 16% neonates, the study was comparable to the observations of Wahi et al and Bener et al where macrosomia was seen in 16.2% and in this study 3% IUD were noted compared to 6% in Nigam et al.

### Conclusion

Gestational Diabetes Mellitus is one of the leading causes of morbidity and mortality for both mother and infant worldwide. A large proportion of women also progress to become overt diabetics in the future hampering with their quality of life by causing morbidity in various forms. Therefore all antenatal women attending the OPD should be offered universal screening for GDM and if found negative the test has to be repeated every trimester. Once diagnosed with GDM appropriate glycemic control either via insulin or meal plan has to be achieved for good pregnancy outcome and to prevent the complications. Proper counselling should be given to the patient at the time of discharge to have her sugars checked in the postpartum period. Early detection, timely referral, frequent antenatal visits 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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