

# Diabetes Complicating Pregnancy in a Tertiary Care Center for 3 Months: An Observational Study

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## Abstract

**Introduction:** Diabetes is the most common endocrine disorder complicating pregnancy. The incidence of both Type I and Type II diabetes is increasing worldwide. As the incidence of diabetes continues to rise and increasingly affects individuals of all ages including young adults and children, women of childbearing age are at increased risk of diabetes during pregnancy.

**Materials and Methods:** It was an observational prospective study done at Government Theni Medical College, Theni, during 3 months between January and March 2017. All antenatal patients with gestational diabetes mellitus (GDM) and diabetes complicating were included in the study. Detailed history and physical and biochemical examinations were performed. Their outcome of delivery and neonatal and maternal complications were studied, and results were analyzed.

**Results:** Maternal complications included pre-eclampsia, polyhydramnios, preterm delivery, infections, mode of delivery, and shoulder dystocia. Perinatal outcomes included macrosomia, hypoglycemia, hyperbilirubinemia, congenital malformations, respiratory distress, and perinatal mortality. Of the 35 cases, 95% were GDM and 5% Type II diabetes mellitus. Rate of pre-eclampsia was 25%, preterm delivery 20%, polyhydramnios 15%, and maternal infection 5%. Rate of cesarean section was 68%. The rate of congenital malformations was 2%, hypoglycemia 16%, respiratory distress syndrome 22%, and perinatal mortality rate 6%.

**Conclusion:** Pre-eclampsia, preterm delivery, and polyhydramnios were the most common antenatal complications. Preterm delivery was significantly associated with perinatal mortality.

**Key words:** Gestational diabetes mellitus, Maternal complications, Perinatal outcome, Pre-gestational diabetes

## INTRODUCTION

Diabetes is the most common endocrine disorder complicating pregnancy. Incidence of both Type I and Type II diabetes is increasing worldwide. As the incidence of diabetes continues to rise and increasingly affects individuals of all ages including young adults and children, women of childbearing age are at increased risk of diabetes during pregnancy.<sup>1</sup> Diabetes may manifest itself for the first time in pregnancy – gestational diabetes or a diabetic woman may become pregnant (pre-gestational

diabetes mellitus [GDM]). The WHO defines gestational diabetes mellitus as carbohydrate intolerance resulting in hyperglycemia of variable severity with onset or first recognition during pregnancy.<sup>2</sup> Indian women have an eleven-fold increased risk of developing glucose intolerance during pregnancy compared to Caucasian women.<sup>3</sup> Among ethnic groups in the South Asian countries, the Indian women have the highest frequency of GDM.<sup>4</sup> Diabetes in pregnancy is associated with increased risks to the woman and to the developing fetus.<sup>5</sup> Gestational diabetes mellitus also increases the likelihood of subsequent diabetes in the mother, in high-risk women the risk of recurrence in the future pregnancies has been reported to be as high as 68%.<sup>6</sup>

## MATERIALS AND METHODS

This is an observational prospective study conducted in the Department of Obstetrics and Gynecology, Government Theni Medical College, Theni, during January-March 2017.

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35 women with diabetes complicating their pregnancy were included in the study. This study was approved by the Institutional Ethical Committee.

### Inclusion Criteria

Pregnant women diagnosed as diabetics, both gestational and pre-gestational diabetes, were included in the study. This study was approved by the Institutional Ethical Committee.

### Exclusion Criteria

Pregnant women with diabetes having any other medical complications such as essential hypertension, renal disease, heart disease, or epilepsy were excluded in the study.

Data collected using pro forma and biochemical tests such as blood sugar were taken. Maternal complications such as pre-eclampsia, polyhydramnios, preterm labor, maternal infections, maternal hypoglycemia, ketoacidosis, diabetic nephropathy, and retinopathy. Mode of delivery and perinatal outcomes were studied. Congenital malformations, neonatal complications such as hypoglycemia, respiratory distress syndrome, macrosomia, birth injuries, polycythemia, hypocalcemia were studied. Perinatal mortality was also recorded. All the 35 women met the inclusion criteria. Statistical analysis was performed using Chi-square test and logistic regression.

## RESULTS

Total numbers of deliveries during the study period were 1531. Incidence of diabetes complicating pregnancy is 35(2.2%). Age of the cohort ranges between 19 and 43 years, mean age being 27.66 years (Table 1). There were 30 (85.1%) GDM, 5 (14.2%) was overt diabetes mellitus (Table 2). Out of 35 women delivered, 33 were live births, and 2 were term intrauterine demise.

About 74% of the study population were multigravida (Table 3). There were 27 (77.14%) term deliveries and 8 (22.8%) preterm deliveries. Birth weight of the babies ranges from 1.9 to 4.9 kg (Table 4). Mean birth weight is  $3112 \pm 712$  g. There were 4 (11.4%) babies with birth weight  $>4$  kg. There was one case of Erb's paresis, the baby recovered from the injury, and there was no residual deficit. There was two-term intrauterine fetal demise; both the women had uncontrolled gestational diabetes. There were two cases of neonatal death, both the babies were preterm (Table 5). About 25.7% patients had associated pre-eclampsia, followed by other complications such as polyhydramnios (17.1%), preterm labor (20%), and infections (5.7%) (Table 6). There is increased rate of lower segment cesarean section accounting to 68.6% (Table 7).

**Table 1: Maternal age distribution**

| Age (years) | n=50 (%)  |
|-------------|-----------|
| ≤20         | 3 (8.5)   |
| 21-24       | 10 (28.5) |
| 25-29       | 14 (40)   |
| 30-34       | 4 (31.4)  |
| 35-39       | 3 (8.5)   |
| >40         | 1 (2.8)   |

**Table 2: Type of diabetes**

| Type  | n=35 (%)  |
|-------|-----------|
| GDM   | 30 (85.8) |
| Overt | 5 (14.2)  |

GDM: Gestational diabetes mellitus

**Table 3: Parity distribution**

| Parity       | n (%)     |
|--------------|-----------|
| Primigravida | 9 (25.7)  |
| Multigravida | 24 (74.3) |

**Table 4: Birth weight**

| Birth weight in kg | n (%)     |
|--------------------|-----------|
| <2                 | 1 (2.8)   |
| 2-3                | 9 (25.7)  |
| 3-4                | 22 (62.8) |
| >4                 | 4 (11.4)  |

**Table 5: Mode of delivery**

| Mode             | n (%)     |
|------------------|-----------|
| LSCS             | 24 (68.6) |
| Vaginal delivery | 11 (31.4) |

LSCS: Lower segment cesarean section

**Table 6: Maternal complications**

| Complications         | n (%)    |
|-----------------------|----------|
| Pre-eclampsia         | 9 (25.7) |
| Polyhydramnios        | 6 (17.1) |
| Preterm labor         | 7 (20)   |
| Infections            | 2 (5.7)  |
| Ketoacidosis          | 0 (0)    |
| Diabetic nephropathy  | 0 (0)    |
| Diabetic retinopathy  | 0 (0)    |
| PPROM                 | 2 (5.7)  |
| Shoulder dystocia     | 1 (2.8)  |
| Maternal hypoglycemia | 0 (0)    |

PPROM: Premature rupture of membranes

## DISCUSSION

Diabetes is the most common medical complication of pregnancy. Of late, the prevalence of diabetes is increasing, which could be attributed to the urbanization, the obesity pandemic, and physical inactivity Zargar.<sup>7</sup>

**Table 7: Neonatal complications**

| Complications         | n (%)     |
|-----------------------|-----------|
| Hypoglycemia          | 7 (20)    |
| Hypocalcemia          | 0 (0)     |
| RDS                   | 6 (17.14) |
| Polycythemia          | 2 (5.7)   |
| Birth injuries        | 1 (2.8)   |
| Perinatal mortalities | 2 (5.7)   |

RDS: Respiratory distress syndrome

Hunt and Schuller<sup>1</sup> reported cesarean section rate >60% and WHO *et al.*<sup>2</sup> reported 67% the following results were correlating with the present study. The present study showed a significant association between preterm delivery and perinatal mortality. Dornhorst *et al.*<sup>3</sup> reported three-fold increased risk of hypoglycemia in the neonate of women with GDM. Seshiah *et al.* and Beischer *et al.*<sup>4,8</sup> reported 10 times higher risk of congenital malformations and 4-7 times higher risk of perinatal mortality in GDM. Fetal malformations are more common with poor metabolic control in early pregnancy Casson *et al.*<sup>5</sup> The most frequent malformations observed are heart defects. Infants born to women with GDM were significantly larger (mean birth weight 3584 g).

The estimated lifetime risk of diabetes is higher at birth and throughout life for ethnic and racial minority groups than for non-Hispanic whites and women compared to men. Diabetes during pregnancy either gestational or pre-gestational increases the maternal and perinatal morbidity and mortality. Risk of polyhydramnios in the study was 17.1%. Spong *et al.*<sup>6</sup> reported polyhydramnios as the most common antenatal complication, significantly higher in Type II diabetes mellitus. Reported risk of developing polyhydramnios three times higher in diabetic compared to non-diabetic pregnant women.

## CONCLUSION

Gestational diabetes was more prevalent in the study. Pre-eclampsia, preterm delivery, and polyhydramnios were the most common antenatal complications. Preterm delivery was significantly associated with perinatal mortality. Hypoglycemia was the most common neonatal complication requiring neonatal intensive care unit admission.

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