



## A STUDY ON PERINATAL OUTCOME OF GESTATIONAL DIABETES MELLITUS

## Obstetrics &amp; Gynaecology

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## ABSTRACT

**INTRODUCTION:** Incidence of diabetes is increasing day by day. About 1-14% pregnancies are complicated by diabetes mellitus and out of them 90% are gestational diabetes mellitus (GDM). GDM adversely affects both mother and fetus. With early diagnosis, adverse effect on both mother and fetus can be prevented by timely management. **AIMS AND OBJECTIVE:** Present study was done to know the perinatal outcome in GDM. **MATERIAL AND METHOD:** This was a prospective study done in outdoor and labour room emergency, department of Obs and Gynae, PMCH, Patna during January 2016 to December 2017. 100 patients diagnosed to have GDM were included in this study. One step procedure 75gm glucose test was done to diagnose GDM (irrespective of the time of the last meal). Venous plasma glucose value at 2 hour equal to or more than 140mg/dl was diagnosed as GDM. **RESULT:** Preterm delivery was seen in 11%, Macrosomia in 17%, IUD in 3 cases, Congenital malformation (one anencephaly, one omphalocele, one single umbilical artery) in 3 cases, 28% neonate needed admission in NICU while neonatal death was seen in 4 cases. Incidence of Hypoglycaemia 24%, Hyperbilirubinemia 16%, Meconium aspiration 11% reported. **CONCLUSION:** GDM is a high risk factor both for mother and fetus. All pregnant women should be screened for GDM. By routine screening GDM patients could be identified early, and timely intervention could be done to improve pregnancy outcome.

## KEYWORDS

GDM, Early Diagnosis, early Management, Improved Pregnancy Outcome.

## INTRODUCTION:

India has the largest population of diabetes world wide (43 million). About 1-14% of all pregnancies are complicated by diabetes mellitus and 90% of them are gestational diabetes mellitus (GDM). Among the GDM patients about 50% become overt diabetic (type 2, insulin resistance) over a period of 5-20 years. GDM is defined as carbohydrate intolerance of variable severity with onset or first recognition during present pregnancy. This definition is used irrespective of the fact whether the condition persists after pregnancy or not. GDM usually presents late in second or third trimester of pregnancy. It appears that many of these women diagnosed as GDM, were already suffering from impaired B-Cell function but it remained undetected before pregnancy. There is controversy regarding screening, diagnosis, glucose level threshold as different organisations use different criteria. High risk cases for GDM are: family history of diabetes, previous birth of baby  $\geq 4$  kg, H/O still birth, polyhydramnios, recurrent vaginal candidiasis, obesity (BMI  $\geq 30$ ). GDM adversely affects both mother and fetus and increases morbidity and mortality. In mother there is increased risk of: preclampsia, preterm labour, chorioamnionitis, polyhydramnios, UTI, obstructed labour, recurrent pregnancy loss. In fetus there is increased risk of macrosomia (maternal hyperglycemia  $\rightarrow$  increased glucose transfer  $\rightarrow$  hyperinsulinemia  $\rightarrow$  increased growth), congenital anomalies- neural tube defects, cardiovascular anomalies, caudal regression syndrome, hydronephrosis, duodenal atresia, small left colon syndrome. (When HbA1c is  $< 7\%$  -- there is no increased risk for anomalies), uteroplacental insufficiency, hyperglycemia, polycythemia. Long term sequelae in neonates are: obesity, type 2 DM, impaired cognitive and motor function.

## AIMS AND OBJECTIVE

Present study was done to determine perinatal outcome in GDM pregnancy.

## MATERIAL AND METHOD

- This was a prospective study done in outdoor and labour room emergency, Department of Obs and Gynae, PMCH, Patna, during January 2016 to December 2017.
- 100 patients having GDM were studied for perinatal outcome of their pregnancy. 200 patients with normal pregnancy without GDM and other medical conditions were taken as control.
- During 1<sup>st</sup> antenatal visit one step procedure 75gm glucose test was done to diagnose GDM (irrespective of the time of the last meal), as recommended by DIPSI and WHO.
- Venous plasma glucose value at 2 hr  $\geq 140$  mg/dl was diagnosed as GDM. (advantage of DIPSI - pregnant lady should not fast, can be performed in 1<sup>st</sup> visit, it is screening as well as diagnostic test.)

- Age, BMI, socioeconomic status was noted.
- Those who were diagnosed with GDM, kept on MNT (medical nutritional therapy) and exercise for 2 weeks in consultation with a dietician.
- After 2 weeks 2hr PP blood glucose was checked. If 2hr PP  $< 120$  mg/dl  $\rightarrow$  MNT continued  $\rightarrow$  repeat 2hr PP every 2 wk till 30 wk then weekly PP. If 2hr PP  $\geq 120$  mg/dl  $\rightarrow$  insulin therapy started with consultation of endocrinologist. Fasting & PP done every 3<sup>rd</sup> day  $\rightarrow$  when F  $< 95$  mg/dl & PP  $< 120$  mg/dl  $\rightarrow$  blood glucose was monitored every 2 wks
- Dose of insulin  
0.6-1 IU/kg/day in divided dose.  
Total insulin 2/3<sup>rd</sup> in morning + 1/3 at night  
Morning dose - 2/3<sup>rd</sup> NPH + 1/3<sup>rd</sup> short acting (70:30)  
Predinner dose - 1/2 NPH + 1/2 short acting (50:50)
- Fetal surveillance was done by USG in 1<sup>st</sup> trimester (11-14 wk). Detailed anomaly scan (Level 2 USG) done at 18-20 wks. Fetal echocardiography was done in selected cases around 24 wks. If the GDM patients had HTN or IUGR - Umbilical artery doppler was done in 3<sup>rd</sup> trimester. Fetal growth monitoring was done 4 wks.
- If blood sugar was controlled by diet only - induction at 39 wks. If needed insulin - induction at 38 wks. (caesarian section done for obs indication.)

## RESULT

Table 1

| GDM controlled by diet | Needed insulin |
|------------------------|----------------|
| 74 patients            | 26 patients    |

Above table shows that 26% of GDM patients needed insulin.

Table 2

|          | GDM     | CONROL  |
|----------|---------|---------|
| Mean age | 24.8 yr | 24.1 yr |
| BMI      | 25.8    | 25.4    |

Above table shows that mean age in GDM group was 24.8 yr compared to 24.1 yr in control group. BMI in GDM group was 25.8 compared to 25.4 in control group.

Table 3

|                      | GDM | CONTROL |
|----------------------|-----|---------|
| Family history of DM | 28% | 12%     |

Above table shows that family history of DM was present in 28% of GDM patients compared to 12% in control group.

**Table 4- obstetrical outcome in 2 groups.**

|                       | GDM     | CONTROL  |
|-----------------------|---------|----------|
| Preterm delivery      | 11(11%) | 7(3.5%)  |
| Mode of delivery      |         |          |
| Vaginal               | 61(61%) | 130(65%) |
| Caesarian             | 39[39%] | 70(35%)  |
| Instrumental delivery | 7(7%)   | 5(2.5%)  |

Above table shows that preterm delivery was higher in GDM group(11%) compared to 3.5% in control group.

**Table 5-perinatal outcome & neonatal complications.**

|                     | GDM      | CONTROL   |
|---------------------|----------|-----------|
| MACROSOMIA          | 17       | 3(1.5%)   |
| BABY WT             | 2816 gm  | 2740 gm   |
| APGAR SCORE         |          |           |
| 1 MIN               | 8.03     | 8.04      |
| 5MIN                | 8.56     | 8.65      |
| MECONIUM ASPIRATION | 11(11%)  | 9(4.5%)   |
| HYPOGLYCEMIA        | 24(24%)  | 14(7%)    |
| HYPERBILIRUBINEMIA  | 16(16%)  | 23(11.5%) |
| IUD                 | 3 (3%)   | 4(2%)     |
| CONGENITAL ANOMALY  | 3(3%)    | 2(1%)     |
| NICU ADMISSION      | 28 (28%) | 14(7%)    |
| NEONATAL DEATH      | 4(4%)    | 3(1.5%)   |

Above table shows that macrosomia was higher in GDM group (17%) compared to 1.5% in control group. In GDM group hypoglycemia was seen in 24% compared to 7% in control group. Hyperbilirubinemia was seen in 16% of GDM group compared to 11.5% in control group. In GDM group 28% newborn needed NICU admission compared to only 7% in control group.

## DISCUSSION

GDM is common problem in pregnancy. It is well known that overt DM has adverse perinatal outcome. There is controversy regarding adverse effect of GDM due to different screening and diagnostic criteria.

In the present study, it was seen that GDM was associated with adverse perinatal outcome like preterm delivery, macrosomia, meconium aspiration, hypoglycemia, hyperbilirubinemia, IUD, NICU admission and neonatal death. HAPO(Hyperglycemia and Adverse Pregnancy Outcome) study also noted increased rate of large for date baby, neonatal hypoglycemia, preterm delivery, hyperbilirubinemia, NICU admission. In HAPO study, it was also seen that incidence of complication was directly related to blood glucose level. Most et al also reported adverse perinatal outcome in his study.

In this study, family history of diabetes mellitus was seen in 28% of GDM patients compared to 12 % of control group. Nair et al also reported GDM to be associated with family history of diabetes mellitus.

In this study 26% patients needed insulin. In a study done by Balaji et al in south India, insulin was needed in 9.7% of GDM patients. Higher need of insulin may be due to the fact that patients might be diabetic before being pregnant.

In this study, no significant difference was seen in mode of delivery in GDM patients and control group. In HAPO study similar results were seen. Nair et al also reported similar results.

APGAR score were almost similar in the two groups. Similar results were seen by Nair et al. Instrumental delivery was higher in GDM patients.

Mean birth weight was higher in GDM patients (2816 gm) compared to (2740 gm) in control group. In the present study macrosomia was seen in 17% foetus which was higher than the control (1.5%). Nair et al & Djomhou et al also reported increased incidence of macrosomia in GDM patients. Mitanchez et al also reported increased rate of macrosomia. Similar results were seen in HAPO study also.

Preterm delivery was seen more in GDM group (11%) compared to (3.5%) in control group results of which were similar to HAPO study. Neonatal hypoglycemia was reported to be (24%) in GDM compared to (7%) in control group. Result being similar to HAPO study.

Hyperbilirubinemia was higher in GDM patients (16%) compared to (11.5%) in control group. HAPO study also reported higher incidence of hyperbilirubinemia.

Congenital anomaly was also seen to be higher in GDM patients. Other studies did not find increased incidence of congenital anomaly in GDM patients. Increased association in the present study maybe due to the fact that the patient might be diabetic before start of pregnancy.

## CONCLUSION

Prevalence of GDM is high in India. Life style changes, sedentary habit is responsible for increasing prevalence of GDM. Regular antenatal screening is essential. Adequate management of GDM by diet, exercise, insulin can control blood sugar. As the blood sugar gets within normal limit, maternal and perinatal outcome improves.

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