

Prevalence of adverse Birth Outcome of Gestational Diabetes mellitus in Trichy district.

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Abstract: Gestational Diabetes Mellitus (GDM) is defined as carbohydrate influence of variable severity with first recognition of pregnancy, which as an adverse effect on both mother and the foetus. This case control study was carried out with the aim to determine the foetal outcome of Gestational Diabetes Mellitus (GDM) cases who had regular antenatal check-up in Obstetric Out Patient Department of Tertiary care centre in Trichy District. Structured proforma was given to the participants and control to collect socio demographic data. Results showed there is a significant increase in prevalence of GDM and in upper class population. There was statistically significant association in the prevalence of GDM cases with family history of DM and BMI. The foetal complications and adverse birth outcome such as low Apgar ie <6, Macrosomia, neonatal jaundice and Respiratory distress which was statistically significant.

Key words:- Adverse Birth outcome, Gestational Diabetes Mellitus, Insulin resistance

I. INTRODUCTION:

Gestational Diabetes Mellitus (GDM) is defined as carbohydrate influence of variable severity with first recognition of pregnancy, which is an adverse effect on both mother and the foetus [1, 2]. During the period 2015-2016, the Prevalence of GDM in India is five million and in south India, it is 13.4%. [1]. Pregnancy causes progressive changes in maternal carbohydrate metabolism [3]. As pregnancy advances insulin resistance and diabetogenic stress due to placental hormones necessitate compensatory increase in insulin secretion [4]. When this compensation is not adequate gestational diabetes develops [5]. Although most women with GDM usually return to the normoglycemic state shortly after childbirth, they still have seven times higher risk of developing type 2 diabetes (T2DM) in the future [6]. If not diagnosed early, GDM can cause maternal complications [8] and foetal complications like Macrosomia, IUGR, Neural Tube Defect, Congenital Heart Disease, Hypocalcaemia, Polycythaemia, Respiratory Distress Syndrome, etc. [9, 10]. Children exposed to maternal diabetes in utero are known to have high risk of Obesity and Diabetes compared to their unexposed siblings [11]. The study creates awareness of GDM among cases controls. Effective care which results in safe motherhood and also primary prevention of Obesity, Diabetes Mellitus and IGT in offspring. [12]

II. AIM & OBJECTIVES:

To study prevalence of foetal outcome of Gestational Diabetes Mellitus (GDM) cases in Trichy District.

III. MATERIAL & METHODS:

This case control study was carried out in Chennai Medical College Hospital and Research Centre, with cases of GDM who had regular antenatal check-up in Obstetric OPD and age matched pregnant females as control subjects. Study was started after obtaining approval from the Institutional Ethics Committee & informed consent from the study group and control groups.

3.1. Inclusion criteria: Both primi and multi gravida GDM cases, belonged to the age group between 20 to 40 years who attended the OG department OPD in the II Trimester for regular Antenatal check-up and recently delivered in our CMCH&RC Institution were included after screening for Gestational Diabetes mellitus. The Screening was done by Oral Glucose tolerance test at 24-28 weeks of gestation. (as per WHO criteria- By giving 75g of oral glucose in Fasting state the estimated Blood sugar in Fasting stage >126 mg/dl, and 140mg/dl after 2 hours)

3.2. Exclusion criteria: Pregnant women with other maternal complications like Twin pregnancy, overt Diabetes and those who did not give consent were excluded from the study.

3.3. Sample size: 100 (GDM cases n=100 & Age matched normal pregnant females as controls, n=100.)

3.4 Method: Structured proforma was used to collect a socio demographic history family history of diabetes, Height, Weight, BMI, Blood sugar were collected from the study participants, at the time of diagnosis of GDM. After delivery the newborn was screened for macrosomia by measuring the Birth weight. Blood calcium, complete blood count were measured to screen for Hypocalcemia and Polycythemia. Hypoxia by assessing the five minute Apgar score, Respiratory distress syndrome. Neural tube defect, congenital heart disease were ruled out by ultra sonogram and Echocardiogram reports.

3.5 Statistics: Descriptive statistics, Chi square, Pearson t-test and odds ratio with CI=95% were used and analysed by SPSS 21 software.

IV. RESULTS:

GDM cases (100) were compared with 100 age-matched controls. The mean age of cases was 28.57 ± 4.7 years and the mean age of controls was 26.43 ± 3.511 years. The t-test done showed no significant difference between the two. There is a significant increase in prevalence of GDM and in upper class population 61% (df=4, p=0.0001). There was statistically significant association in the prevalence of GDM cases with family history of DM 72% OR=13.5 p=0.0001, and BMI 84% OR=6.8 p=0.0001 than controls. There is no association between the prevalence of GDM and Occupation, level of education of study subjects.

TABLE No1: predisposing factors. n=100 cases 100 controls

| Sl.no | Predisposing factors | Cases (100) | Controls (100) | OR CI=95 | Significant |
|-------|-------------------------------|-------------|----------------|----------------|-------------|
| 1 | Positive family history of DM | 72 | 16 | 13.5(6.7-26.9) | P=0.0001* |
| 2 | BOH | 31 | 18 | 2.0(1-3.9) | P=0.0343 |
| 3 | BMI>23 | 84 | 42 | 6.8(3.5-13.1) | P=0.0001* |
| 4 | Primi multit | 47 53 | 45 55 | 1.08(0.6-1.8) | P=0.7766 |

*P value less than 0.05 is considered as significant

The foetal complications were found to be higher in cases 70% OR=8.2(df=1, p=0.000) such as low Apgar <6 (35 vs 81) OR=7.9 p=0.00001, Macrosomia (17 vs 0) OR=42, p=0.009, neonatal jaundice OR=2.8 p=0.0014 (40% vs 19%), and Respiratory distress OR=3.8 p=0.0001(49% vs 20%). Still birth was seen in one GDM case.

TABLE 2: Adverse foetal outcome.

| Sl no | Adverse Foetal outcome | Cases (100) | Controls (100) | OR CI=95% | Significant |
|-------|-------------------------------|-------------|----------------|-----------------|-------------|
| 1 | 5 min APGAR Score <6 | 65 | 19 | 7.9(4.14-15.11) | P=0.0001* |
| 2 | Macrosomia | 17 | 0 | 42(2.4-71) | P=0.009* |
| 3 | Jaundice | 40 | 19 | 2.8(1.4-5.3) | P=0.0014* |
| 4 | Respiratory distress syndrome | 49 | 20 | 3.8(2.0-7.1) | P=0.0001* |
| 5 | Still birth | 1 | 3 | 0.32(0.03-3.19) | P=0.336 |

*P value less than 0.05 is considered as significant

V. DISCUSSION:

Gestational Diabetes mellitus is a severe and neglected threat to material and child health. Wing hung et al proved that in-utero exposure to hyperglycemia has been associated with increase incidence of impaired glucose tolerance and defective insulin secretory response independent of genetic predisposition to type 2 DM.[11]As per the previous study increase in obesity and BMI >23, family history of DM are responsible for increased prevalence of DM [13]. Previous studies done by Issat et al concluded that obesity, linked to polycystic ovarian syndrome, in foetus and irregular menstrual cycle were found to be important risk factors.[14]The current study revealed that the higher prevalence of GDM was found to be associated with those who have a family history of DM[15,16], [17] similar to the previous study. There is a significant increase in prevalence of GDM for upper class population which is a contradictory finding from the previous study done by Ghadeer et al. stated that cases from lower socio economic status had more prevalence of GDM. [18] [19]. Maternal complications like pregnancy induced hypertension were positively correlated with GDM [20] PPH and pre term labour was highly associated maternal complication in our study[22]. Foetal complications like Low Apgar score, Macrosomia, Neonatal jaundice, and respiratory distress was significantly associated with GDM in our study like previous studies[22]. But the previous study done by [21] stated that respiratory distress and neonatal jaundice were not significantly increased in GDM cases when compared to controls[23]. Chetan et al proved that GDM is significantly associated with stillbirth[24]. But in our study the evidence for association of still birth with GDM is not statistically significant.

VI. CONCLUSION:

To reduce the incidence of adverse birth outcome of gestational DM which is based on multiple etiology, we can create awareness about maternal age, BMI, Blood sugar & gestational DM & its complications. By introducing the preventive measures at the earliest possible like dietary modifications & exercise like regular monitoring of blood sugar, ultrasound screening and antenatal visits to avoid foetal morbidity and mortality. Early intervention with Gestational Diabetic patients through diet and exercise prior to 28 weeks will have better results and fewer complications.

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