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Gynecology

MATERNAL AND FETAL OUTCOME IN GESTATIONAL DIABETES MELLITUS

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ABSTRACT

OBJECTIVES: To assess the fetomaternal outcome of pregnancy in mothers with gestational diabetes mellitus (GDM) with healthy pregnant women.

METHOD: A cross sectional study, conducted in 1860 patients, where 30 pregnant women with risk factors for GDM attending antenatal clinic and admitted in antenatal ward , was carried out in the department of obstetrics & gynecology of Mahathma Gandhi Memorial government hospital, a tertiary health care referral centre, Trichy, over a period of 1 month from MARCH 2017 - APRIL 2017.

RESULTS: The findings of the present study confirmed that GDM patients are liable to have adverse pregnancy outcomes. As expected, women with GDM in present study were found to have a higher maternal and perinatal morbidity and mortality compared to normal pregnant women. Increasing age(31±5.5years) of patient was significantly associated with GDM. Poor past obstetric history, past history for GDM, positive family history carried significant high risk for GDM.

CONCLUSION: Early detection of GDM and screening of high risk group with provision of appropriate treatment will reduce the social and financial burdens of managing the complications of GDM.

KEYWORDS : GDM(gestational diabetes mellitus),insulin, NICU(neonatal intensive care unit),macrosomia, shoulder dystocia.

INTRODUCTION

Diabetes mellitus is a group of metabolic disorders characterized by hyperglycemia resulting from defects in insulin secretion, insulin action or both(1). GDM is the most common and serious metabolic complication which put mother and fetus at risk of potential complications. The GDM is a distinct clinical entity deserving early recognition and prompt treatment. It is defined as carbohydrate intolerance of variable severity with an onset or first recognition during pregnancy and develops in around 1-3 % of all pregnancies. Normal pregnancy is considered to be a diabetogenic state characterized by exaggerated rate and amount of insulin release , associated with decreased sensitivity to insulin at cellular levels. Many of the changes are results of the progressive rise in the levels of estrogen, progesterone ,human placental lactogen, cortisol and prolactin as pregnancy advances. 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(2). The carbohydrate intolerance is usually a temporary condition induced by metabolic stress of pregnancy and treated by diet control alone or by insulin therapy. This abnormality in glucose metabolism may or may not be normalised after delivery. There is 3fold rise in serum cortisol and human placenta contains enzymes (eg.insulinase) that increase the degradations by potentiating the secretion of insulin, but in GDM the pancrease fail to respond adequately. GDM is associated with increased fetomaternal morbidity as well as long term complications in mother and babies. (ACOG) on contrary advocates selective screening for patients with high risk factors such as history of previous GDM, strong family history of diabetes, member of an ethnic group with high prevalence of GDM, maternal age more than 25 years, obesity, persistent glycosuria, macrosomia (birth weight>4gm), polycystic ovarian syndrome, spontaneous abortions and unexplained still births(4). Risk of developing diabetes mellitus and the complications in fetus are macrosomia, which will increase risk of operative delivery and shoulder dystocia, increase incidence of hypoglycemia, hypocalcemia, congenital malformations, polycythemia, hyperbilirubinemia, respiratory distress syndrome, and long term complications are obesity, development of type 2 diabetes mellitus during childhood, impaired motor functions and higher rates of in attention and hyperactivity. Several studies have shown that 50% GDM developed diabetes mellitus within 10 – 20 years of index pregnancy. Majority of women may be obese and consuming very few vegetables and fruits. Women with GDM are heterogenous group and 80% develop permanent clinical diabetes. It affects 4% of all pregnant women, in most cases all diabetic symptom disappear after delivery. GDM can be controlled by diet with low glycaemic index and exercise. It usually begins about 24-28 weeks of gestation. Vascular complications are due to poor blood glucose control and are associated with the severity of the disease. During GDM pregnancy the fetus is exposed to increased insulin secretion due to high level of glucose that leads to macrosomia. Macrosomia causes shoulder dystocia and infant hypoglycaemia.

The risk associated with GDM are well established however its impact on health of mother and fetus is unclear. GDM is associated with increased perinatal mortality (example: macrosomia, neonatal hypoglycaemia, jaundice, Respiratory Distress Syndrome)

Extra glucose in blood stream crosses the placenta which triggers baby's pancreas to make extra insulin. This causes macrosomia.

Untreated moderate or severe GDM increases the risk of fetal and neonatal complications.

BIRTH WEIGHT AND ADIPOSITY: There is a positive correlation with maternal glucose levels, increase in birth weight and adiposity. Fetal macrosomia is due to fetal insulinemia. Over weight and obesity is an additional risk factor for macrosomia. Treatment of GDM reduces the incidence of macrosomia.

BIRTH INJURIES: brachial plexus injuries are associated with shoulder dystocia.

METABOLIC DISTURBANCES: the incidence of hypoglycaemia is less than 5% .the risk of hypocalcemia and hyperbilirubinemia are similar to general population.

PERINATAL DEATH: Its is mainly attributable to undiagnosed type 2 DM. Maternal obesity is an additional risk factor for perinatal death. Normoglycemia in the pre conceptional period and first trimester is essential to reduce the increased incidence of congenital malformations which threaten organogenesis. Early diagnosis and prompt treatment reduces the risk of congenital anomalies.

The objective of the study was to compare the fetal and maternal outcome of gestational diabetes mellitus with healthy pregnant women. GDM is associated with increased risk of serious perinatal morbidities and mortalities as well as maternal morbidity.

MATERIALS AND METHODS: This was conducted in the department of obstetrics and gynaecology, MGMGH,Trichy. A total of 30 patients diagnosed as having GDM was taken for this study. All the selected women were registered from early conception (6 weeks) and were given a 75 gm anhydrous glucose powder dissolved in a glass of

water, to be consumed over 5 minutes, irrespective to the time of last meal. A venous blood sample was collected at 2 hours for estimating plasma glucose by the glucose oxidase peroxidase (GOD-POD) method. The subjects were asked to avoid physical activity and smoking for 2 hrs after intake of glucose. Gestational diabetes mellitus was diagnosed if 2 hrs plasma glucose is >140 mg/dl . The data on maternal and fetal outcomes were analysed. In women who were found to have normal glucose level at first antenatal visit, the test was repeated at around 24 - 28 wks period of gestation. This was carried out during March and April 2017 at Mahathma Gandhi Memorial government hospital, Trichy.

OUTCOME AND COMPLICATIONS: Total of 1860 women were delivered in March and April 2017. 30 patients were diagnosed as GDM. Age was measured as continuous variable and it is categorised as above 25 and below 25. 20 patients are above 25 and 10 patients are below 25. Age has statistically significant association with diabetes mellitus.

TABLE 1:

	Cases with GDM(30)	Caseswithout GDM(1830)	TOTAL
RESIDENCE			
1.RURAL	11 (36%)	1520(83%)	1531
2.URBAN	19(63%)	310(16%)	329

TABLE 2:

FAMILY HISTORY	Cases With GDM (30)	Cases Without GDM (1830)	TOTAL
PRESENT	21(70%)	1400(71%)	1421
ABSENT	9(30%)	430 (38%)	439

TABLE 3:

OBSTETRIC INDEX	Cases with GDM (30)	Cases without GDM (1830)	TOTAL
PRIMI	19	1000	1019
G2-G4	5	430	435
>G4	6	400	406

TABLE 4:

PREGNANCY OUTCOME	Cases with GDM (30)	Cases without GDM (1830)
Normal vaginal delivery	10(33.3%)	1200(65%)
Ventous	2(6.6%)	10(16.2%)
Emergency LSCS	2 (6.6%)	300(16%)
Elective LSCS	8(26.6%)	200(12%)
Spontaneous miscarriage	4(13.3%)	40(0.21%)
IUD	2(6.6%)	20(0.10%)
Congenital anomalies	2(6.6%)	30(0.25%)

VARIANCES: Outcome of pregnancies,

1. spontaneous miscarriage- 4 (13.3%)
2. spontaneous vaginal delivery-10 (33.3%)
3. ventouse-2 (6.6%)
4. emergency caesarean section-2 (6.6%)
5. elective caesarean section-8 (26.6%)
6. IUD-2 (6.6%)
7. Congenital anomalies-2 (6.6%)

TABLE 5:

NICU ADMISSION	Cases with GDM (30)	Cases without GDM (1830)
Yes	19(63%)	1208(66%)
no	11(36%)	622(33.9%)

DISCUSSION: it is a transient diabetic condition that occurs in pregnant women and usually disappears after the pregnant period. Although it can occur at any stage it is usually diagnosed at second and third trimester of pregnancy.

High levels of blood sugar may affect the pregnancy and the heath of the baby. By proper monitoring and good control of GDM during the AN period the prevalence can be reduced. It also reduces the maternal and neonatal complications of GDM.

RISK FACTORS:

- Being a pre diabetic- having elevated blood suger than normal
- GDM in previous pregnancy
- Age >25yrs
- BMI >30
- Having family history of diabetes (parent or sibling has type 2 diabetes mellitus)

It is indicated that the maternal complications were higher in GDM women that the normal pregnant women.Increase in maternal age was associated with higher frequency of GDM and this was in accordance with other studies.In our study, GDM was found to be more prevalent in women from urban areas when compared to rural areas, more common in primigravida, women with increasing maternal age, those women who had family history of GDM.It has been found that the elective LSCS % was higher in GDM patients and GDM babies has more of nicu admissions.

Over all mean maternal age was 28yrs with minimum 21 yrs and maximum 37 yrs of age.complications developed were oligohydromnios, polyhydromnios, IUGR.

8 patients had normal delivery and 18 patients had caesarean section and 2 instrumental delivery. 2 patients had termination of pregnancy due to congenital anomalies.

Major complications are abortions, IUD, IUGR, CPD, ectopic and neonatal death. Minor are liquor complications as oligohydromnios, polyhydromnios, neonatal hypoglycaemia, hyperbilirubinemia and macrosomia. These findings are consistent and compared with other studies.They are reduced with regular follow-up, early diagnosis, tight glycemic control and regular monitoring of HbA1C for maintainance of glycemic control.

Caesarean deliveries are common among women with GDM. It is a successful intervention to reduce the complications associated with GDM such as shoulder dystocia. GDM is a risk factor for hypertension and type 2 diabetes mellitus.

Prevention of macrosomia and still birth should be the prime objective in the treatment of GDM.

MATERNAL COMPLICATIONS OF GDM:

Maternal consequences includes increased rate of instrumental and caesarean deliveries, hypertensive disorders during pregnancy and future risk of type 2 DM as well as other aspects of metabolic syndrome such as obesity, cardiovascular morbidity and recurrent GDM. Increased rate of caesarean section, PPH (due to trauma and shoulder dystocia). Insulin resistance played an important role in the pathogenesis of hypertensive disorders. There is an increased incidence of candidiasis in GDM.Laboratory parameters indicate hyperlipidemia, increased placental insulinase,leptin and tumor necrosis factor.

CAESAREAN SECTION AND INSTRUMENTAL DELIVERIES: has increased to about 30% in pregnant women with GDMGDM is becoming a major health problem because of rapid changes in life style, dietary habits and BMI in developed countries.Neonatal and maternal mortality was 65% and 45% respectively before the discovery of insulin and 2-5% and 2-3% respectively now(2017-2018).

CONCLUSION: early detection of GDM by high risk scan and treatment at appropriate time will reduce the social and financial burdens of managing the complications of diabetes.

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