Brief Communication

Glycemic control and fetal abdominal circumference

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A B S T R A C T

Aim: To study about the correlation between the glycemic status and increase in fetal abdominal circumference in gestational diabetes patients and its relationship with fetal birth weight. **Materials and Methods:** Seventy-five gestational diabetes mellitus (GDM) patients were taken up for study with duly informed consent and suggested for anthropometry profile and glycemic profile with HbA1C. Fetal abdominal circumference was measured during routine scans. The patients were followed up till delivery and the fetal birth was noted. **Inclusion Criteria:** Seventy-five gestational diabetic mothers who have attended a secondary level diabetic clinic and on regular follow-up were included in the study. **Exclusion Criteria:** Pre-GDM mothers, patients with co-morbid disease were excluded from the study. **Expected Results:** Fetal abdominal circumference correlated well with fluctuating glycemic control and fetal birth weight.

Key words: Gestational diabetes mellitus, fetal abdominal circumference, glycemic control

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"*Indian women have an 11-fold increased risk of developing glucose tolerance during pregnancy and thereby increasing incidence of Fetal Macrosomia.*"

The placenta is a highly potent endocrine organ producing steroid and protein hormones, therefore strongly influences maternal carbohydrate metabolism. Glucose freely passes through the placenta, but maternal insulin does not. The fetus begins to produce insulin from the 11th gestational week. Permanent glucose oversupply to the fetus stimulates the fetal pancreatic islet cells to increase insulin production and it gradually induces their hypertrophy and hyperplasia. The mean blood glucose in normal pregnancy is 5.0-5.6 mmol/L (90-100 mg/dl). The post-prandial blood glucose level in pregnancy elevated from 7.2 to 7.8 mmol/L (130-140 mg/dl) due to the result of placental anti-insulin hormones. Glucose tolerance improves in normal early pregnancy due to the effect of human chorionic gonadotropin; however, there is a progressive decrease in glucose tolerance after the 20th gestational week associated with placental anti-insulin hormones. Insulin secretion is increased during normal pregnancy with gestational age. However, the effect of insulin is enhanced by insulinotropic hormones before the 20th gestational week, but is decreased thereafter by the effect of anti-insulin hormones. Thus, the glucose homeostasis is changed in the direction of diabetes mellitus in normal pregnancy, therefore glucose tolerance gradually deteriorates for which pregnancy is often called as diabetogenic.

Fetal macrosomia has been defined in several ways. The definitions include birth weight greater than 4000-4500 g or greater than 90% for the newborn adjusted for race, sex, and gestational age. Based on these definitions, macrosomia occurs in 1-10% of all deliveries. Macrosomia may place the mother and fetus or neonate at risk for adverse outcomes.[1] Antenatal risk factors reportedly predict macrosomia at birth. Identification of these at-risk pregnancies may allow intervention to reduce the risk, to provide appropriate counseling, and to implement appropriate plans for monitoring and follow-up care during pregnancy and after delivery.

1. Maternal diabetes is one of the strongest risk factors associated with giving birth to an infant that is considered large for gestational age. Pre-gestational and gestational

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diabetes result in fetal macrosomia in as many as 50% of pregnancies complicated by gestational diabetes and in 40% of those complicated by type 1 diabetes mellitus. [2] Studies of macrosomic infants of diabetic mothers reveal a greater amount of total body fat, thicker upper-extremity skin fold measurements, and smaller ratios of head to abdominal circumference than macrosomic infants of non-diabetic mothers.[3]

2. Maternal weight prior to pregnancy can affect the weight of the fetus. Women who are obese are more likely to have larger infants.
3. Excessive weight gain in pregnancy is a risk factor for macrosomia. The risk is greater for women with obesity than for women without obesity.
4. Gestational age is associated with macrosomia. Birth weight increases as gestational age increases. Prolonged pregnancies (>41 weeks) are associated with an increased incidence of macrosomia. Macrosomic infants account for about 1% of term deliveries and 3-10% of post-term deliveries.
5. Multiparity and grand multiparity increase the risk of macrosomia. Parity has been reported to be associated with 100-150 g of weight gain at birth.
6. A history of macrosomia can influence future pregnancies. Women who previously delivered a macrosomic fetus are 5-10 times more likely than women without such a history to deliver a baby considered large for gestational age, the next time they become pregnant.
7. Fetal sex influences macrosomic potential. Male infants weigh more than female infants at any gestational age. Recent studies have confirmed this association.
8. Excessive amniotic fluid defined as greater than or equal to 60th percentile for gestational age has recently been associated with macrosomia.
9. Despite these so-called risk factors for macrosomia, much of the variation in birth weights remains unexplained. Most infants who weigh more than 4500 g have no identifiable risk factors.

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