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Original Research Article

Screening for gestational diabetes mellitus by two step method and the neonatal outcome

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ABSTRACT

Background: As Indian women has increased risk of developing GDM, screening for GDM is essential for early diagnosis and treatment and hence to reduce the adverse neonatal outcomes.

Methods: The antenatal women are screened for GDM by administering 50g GCT and the screening test value of >130mg/dl measured at 1 hours were considered screening test positive and subjected to standard 2 hour 75gm OGTT and the neonatal outcome were observed in relation to neonatal birth weight, Apgar, and the occurrence of complications like hypoglycemia, hypocalcemia, hyperbilirubinemia.

Results: The average neonatal birth weight in the study population was 3kg. The women with GDM who required diet alone had average neonatal birth weight of 2.9kgs and the GDM women who were on diet and insulin therapy had average neonatal birth weight of 3.4kg. There was increased incidence of hyperbilirubinemia 33.3% .There was only 1 preterm birth.

Conclusions: There is association with neonatal Complications like hyperbilirubinemia and hypoglycemia with women who had screening positive for GDM.

Keywords: Gestational diabetes mellitus, Lower segment cesarean section, Macrosomia, Neonatal hyperbilirubinemia, Neonatal outcome, Neonatal hypoglycemia

INTRODUCTION

Gestational diabetes mellitus is defined as carbohydrate intolerance of variable severity resulting in hyperglycemia with the onset or first recognition during pregnancy irrespective of treatment with diet or Insulin. Gestational diabetes is associated with adverse maternal and fetal outcome.¹ The prevalence of GDM in India is 16.55%.² The neonatal outcome of GDM positive women have increased risk for macrosomia, hypoglycemia, hypocalcemia, hyperbilirubinemia. Hence screening for gestational diabetes mellitus and effective treatment, by control of blood glucose levels can decrease the risk of adverse neonatal outcomes.

METHODS

This prospective cohort study was conducted from August 2015 to July 2016 in a tertiary care hospital, Shri Sathya Sai Medical College and Research Institute. The Study group consisted of 153 non diabetic pregnant women of gestational age 24 to 28 weeks excluding diabetes mellitus diagnosed prior to pregnancy. All antenatal mothers attending the outpatient department were screened for GDM by 50 gm GCT irrespective of last meal taken. If GCT was elevated above 130mg/dl at 1 hour, these patients were considered as screening test positive and subjected to standard 2 hour 75gm OGTT. GDM was diagnosed according to American diabetes

Association Criteria and treated with diet alone or diet plus Insulin therapy. The patients were followed up and the neonatal outcomes like macrosomia, hypoglycemia, hyperbilirubenemia, hypocalcemia were studied.

Statistical analysis

The data collected were analysed using SPSS Software version 20 and P value estimated.

RESULTS

GDM positive women had significantly higher neonatal birth weight. In our study the mean neonatal birth weight

in GDM Positive women was 3.25kg and statistically significant (P value <0.05).

In our study, the GDM positive women who were on diet alone had the mean neonatal birth weight of 2.98kgs and GDM positive women who were on Diet and Insulin therapy had the mean neonatal birth weight of 3.4kgs.

In our study the GDM positive women who underwent elective LSCS was 58.3% and the GDM positive women who underwent emergency LSCS was 8.3%. The GDM positive women who had a vaginal delivery at term is 33.33%.

Table 1: Effect of GDM treatment on birth weight.

	GDM positive case kept on diet control alone	GDM positive case kept on diet control + insulin
Average neonatal birth wt (kg)	2.98kgs	3.4kgs

In our study, the neonatal complications associated with the GDM positive women were the neonatal hyperbilirubinemia and hypoglycemia.

Table 2: Comparison with other studies.

	Hindi QA et al	Present study
Elective LSCS	55%	58.3%
Emergency LSCS	20%	8.3%
Vaginal delivery	25%	33.3%

Table 3: Incidence of neonatal complications in GDM patients.

Complication	No. of cases	Percentage
Hypoglycemia	3	25%
Hypocalcemia	1	8.33%
Hyperbilirubinemia	4	33.33%
No Complications	4	33.33%

The incidence of hypoglycemia was 25%, hypocalcemia 8.33% and incidence of hyperbilirubinemia was 33.33%. There were no complications in 33.33% cases

ACOG defines macrosomic infants as those whose birth weight exceeds 4500g. Maternal hyperglycemia promotes fetal hyperinsulinemia during second half of gestation which in turn stimulates excessive somatic growth and macrosomia results. None of the GDM positive women managed with diet or diet plus insulin in our study had macrosomia.

DISCUSSION

The hyperglycemia and adverse pregnancy outcome (HAPO) study has shown that GDM had increased

association with large for gestational age infant, cesarean delivery and neonatal adiposity.³

Major et al, described their success with a diet containing 40-42% carbohydrate, compared with a 45-50% carbohydrate diet.⁴ Mild carbohydrate restriction resulted in improved glycemic control, less need for insulin, and fewer large for gestational age infants. Macrosomia was defined as per Indian consensus definition of birth weight 3.5kg or more at term.⁵ Maternal hyperglycemia prompts fetal hyperinsulinemia particularly during the second half of gestation, which in turn stimulates excessive somatic growth and macrosomia results. Similarly, neonatal hyperinsulinemia may provoke hypoglycemia within minutes of birth. The American Diabetes Association (1995) defines < 35 mg/dl as abnormal in a term infant and lower values for preterm infants because glycogen stores are less.

The 75gm, 2 hours OGTT is in use during pregnancy in many countries around the world, typically using the same thresholds as in non-pregnant individuals.⁶

To standardize the diagnosis of GDM the World Health Organisation (WHO) proposed using a 2 hours 75gm OGTT with a threshold plasma glucose concentration of greater than 140mg/dl at 2 hours, similar to that of Impaired glucose tolerance.⁷ Still all these recommendations (ADA and WHO) have not projected the influence of glycemic level on fetal outcome.⁸⁻¹¹

CONCLUSION

Screening for gestational diabetes by two step method helped to identify a large number of GDM cases. Planned diet or Insulin therapy, patient education and team

approach improves fetal outcome in GDM patients and decreases macrosomia and associated neonatal morbidity.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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