

Screening for Gestational Diabetes and Maternal and Fetal Outcome

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OBJECTIVES - To find the incidence of abnormal blood sugar and gestational diabetes mellitus (GOM) in the Indian population and to correlate the abnormal results with maternal and fetal outcome. **METHODS** - Universal screening for GOM was performed on 300 pregnant women with 50 gm 1 hour oral glucose challenge test (OGCT). Those with abnormal results were subjected to 100gm 3 hour oral glucose challenge test (OGTT). All women were followed till delivery and maternal and fetal outcomes were noted. **RESULTS** - Out of 300 women's, 61 (20.3%) were found to have positive screening. Out of them, 12 (4% of 300) were diagnosed as GOM. A higher incidence of LSCS and preterm delivery was found amongst the positively screened and GOM cases. Adverse fetal outcome was found in gestational diabetics. **CONCLUSION** - The increased morbidity in GOM is preventable by meticulous antenatal care. All pregnant women should be screened for GOM at least once during pregnancy and all detected GDMs should be closely monitored for strict glycemetic control for good maternal and fetal outcome.

Key word: diabetes, gestational diabetes, screening for gestational diabetes

Introduction

Gestational diabetes mellitus (GOM) complicates 3.4% of all pregnancies globally and 90% of these cases are definitely associated with a significantly increased maternal and perinatal morbidity". All complications associated with GOM are potentially preventable with early recognition of GOM, intense monitoring and proper treatment. Moreover, in view of the high prevalence of diabetes mellitus and its early onset among Indians, all pregnant women should be screened for GOM. Hence, an appropriate screening for GOM has been much emphasized.

A prospective cohort study was performed on 300 pregnant females attending the antenatal clinic to find the incidence of abnormal results on screening and the incidence of GOM, and to correlate the abnormal results with maternal and fetal outcomes.

Material and Methods

Universal screening for GOM was performed on all pregnant women with 50gm 1hour oral glucose challenge test (OGCT) taking 140 mg/dL as the cut off plasma sugar level for screening as advocated by Bonemo et al³. All the positively screened women were subjected to 100/gm 3 hour diagnostic oral glucose tolerance test (OGTT). Women with two or more deranged OGTT values were categorized as gestational diabetic (GOM) as per the NOOG / ACOG criteria". At

the time of registration, all women were clinically evaluated by a detailed history and a proper general, systemic and obstetric examination paying special attention to their obstetric complications. Depending on the presence or absence of conventional risk factors like age more than 30 years, obesity, history of diabetes in first degree relatives, bad obstetric history (still birth, neonatal death, recurrent abortions, previous congenitally malformed baby), baby weight of more than 4 kg in the past and polyhydramnios, chronic hypertension, pre-eclampsia, recurrent urinary tract infection and moniliasis in the current pregnancy, the women were divided into high or low risk groups. All the cases were followed till delivery and the maternal and fetal outcome were noted. The data was analyzed to correlate the OGCT and OGTT results with the maternal and fetal outcomes.

Results

A total of 300 women were registered for the study at or beyond 20 weeks of gestation. Of these, 106 constituted the high risk group and 194 the low risk group. A universal screening for gestational diabetes revealed 61 (61/300,20.3%) with positive screening. Out of them 12 (12/300, 4%) were diagnosed as gestational diabetes and 6 (6/300,2%) had one abnormal OGTT value. Forty five (45/61,73.8%) positive screened women belonged to the high risk group while 16 (16/61,26.2%) belonged to the low risk group. Similarly among the 12 gestational diabetics, 10 (83.3%) belonged to the high risk group and 2 (16.7%) to the low risk group (Fig.1). Of all the high risk factors, previous history of congenital anomaly, bad obstetric history (mainly recurrent abortions and previous still birth), maternal age \geq 30 years, BMI \geq 27 kg/m² and family history of diabetes were found to be statistically significant for GOM in our study (Table I).

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Table I. Relationship of Screening (OGCT) Value and OGTT Value with individual HighRisk Factor (n=106).

High Risk Factor	Number of Cases	Positive Screening	'P' value	GDM	'P' value 'p' value
Age \geq 30 yrs	42 (39.6%)	19 (45%)	0.000	7 (16.6%)	0.003
BMI > 27 kg / m ²	12 (11.3%)	6 (50%)	0.02	3 (25%)	0.02
Family <i>hio</i> diabetes	28 (26.4%)	11 (39.3%)	0.017	4 (14.3%)	0.05
BOH	19 (17.9%)	12 (63.2%)	0.000	5 (26.3%)	0.002
History of previous congenital anomaly	5 (4.7%)	3 (60%)	0.05	3 (60%)	0.001

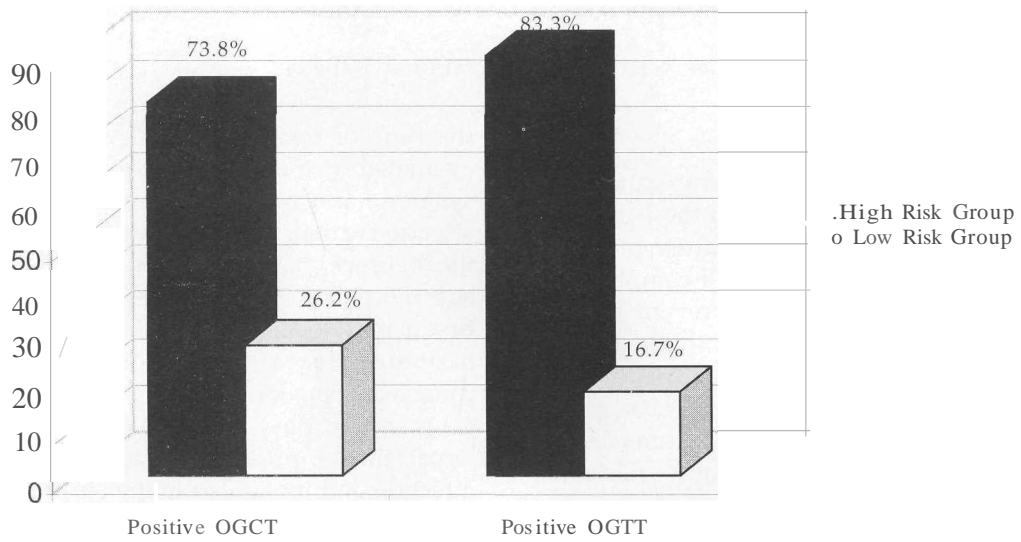


Fig 1 : Relationship of risk factors for CDM with screening (OCCT) and oral glucose tolerance test (OCTT) results

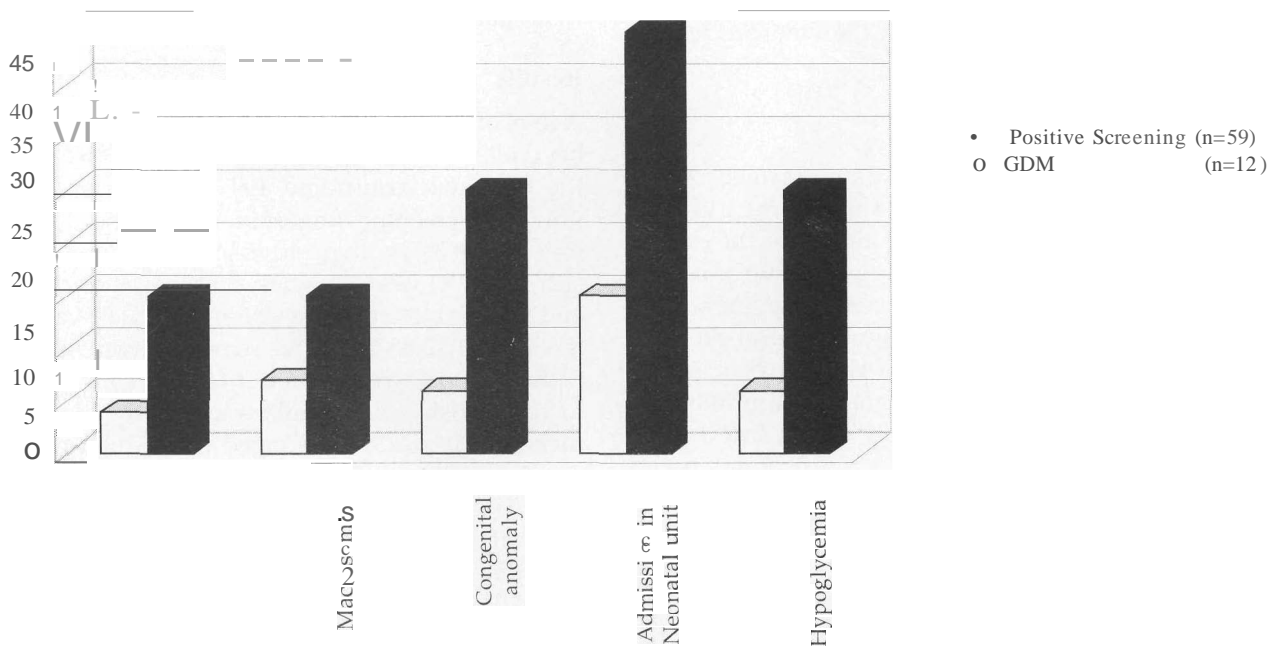


Fig 2 : Relationship of screening (OCCT) oral glucose tolerance test (OCTT) results with adverse fetal outcome

Obstetric and perinatal outcomes were noted in 292 women only since eight women, two of whom had positive screening for GOM, were lost to follow up. The incidence of LSCS was two times higher among the positive screened as compared to negative screened ($P=0.0002$) and three times higher among GOM as compared to those with normal GIT ($p=0.001$). The incidence of preterm delivery was almost three times higher among positive screened ($p=0.02$) and 4.5 times higher among GDM ($p=0.01$).

On comparing the various aspects of fetal outcome between the positive and negative screened groups, statistically significant association was found in terms of admission to neonatal unit ($p=0.001$) macrosomia ($p=0.006$), hypoglycemia ($p=0.007$), meconium aspiration ($p=0.03$), apgar score <7 at 5 min ($p=0.03$) and perinatal asphyxia ($p=0.07$). Similar adverse fetal outcome was found in gestational diabetics too as compared to subjects with normal GTT (Fig.2), in terms of stillbirths ($p=0.004$), macrosomia ($p=0.010$), congenital anomaly ($p=0.001$), admission to neonatal unit ($p=0.004$) and hypoglycemia ($p=0.001$).

Discussion

Gestational diabetes constitutes a metabolically distinct entity with clearly defined associated perinatal and maternal morbidities and hence warrants timely diagnosis and prompt management. We were motivated to perform this study to assess the competence of 50 gm 1 hour oral glucose challenge test for universal screening of pregnant women and to correlate the impact of abnormal glucose tolerance on maternal and perinatal outcomes. Threshold plasma sugar level for screening was taken as 140mg/dL as recommended by NOOG / ACOG criteria and out of 300 women 61 (20.3%) had positive screening for GOM. Subjects with borderline screening value (130 to 139 mg/dL) showed no significant increase in adverse maternal and perinatal outcomes as compared to those with screening value <130 mg/dL emphasizing the acceptability of the OGCT cut off proposed by O'Sullivan et al⁵ in terms of cost effectiveness and morbidity reduction in the Indian population too.

A 4% incidence of gestational diabetes found in our study is comparable to the global incidence of GOM. Risk factors associated with positive screening and with diagnosis of GOM were also found to be highly significant. Nevertheless, when OGCT results were compared between the high risk and the low risk groups, approximately 26% positive screened belonged to the low risk group which would have been missed if selective screening were done. Similarly, 16.7% cases of GOM would have been missed with selective screening, which is definitely unacceptable. This strongly advocates universal screening for glucose intolerance. Increasing maternal age, obesity, family history of diabetes, bad obstetric history and history of congenital anomaly in previous baby were the statistically significant risk factors associated with GOM.

Analysis of obstetric outcome shows a higher incidence of

cesarean delivery and preterm delivery among the positive screened and GOM groups. The major indications for cesarean delivery were non-reactive NST and prior cesarean section while most patients with preterm deliveries had premature leaking or severe preeclampsia or acute fetal distress.

Positive screening and GOM were significantly associated with still birth, low apgar at birth, meconium aspiration, macrosomia, neonatal hypoglycemia, fetal congenital malformation and admission in neonatal unit.

Retrograde analysis of all delivered GOM revealed that those recognized earlier had no stillbirth, macrosomia or admission to neonatal unit further emphasizing the importance of early screening and treatment for GOM. Women with one abnormal GTT value had no increased adverse perinatal outcome in the present study as also in the study reported by Langer et al⁶. This might be because of a smaller cohort size and also due to regular monitoring of these patients to control blood sugar by dietary management. As shown by Schaefer et al⁷, fasting blood sugar level is the best predictor of adverse fetal outcome. Our study confirmed this.

Women with GOM are undoubtedly at increased risk for adverse obstetric and perinatal outcomes. Good maternal and fetal outcomes result from early and meticulous prenatal and intranatal care. Thus all pregnant women should be screened for GOM at least once during pregnancy irrespective of the presence or absence of risk factors and all detected GOMs should be closely monitored for strict glycemic control throughout pregnancy for optimal neonatal outcome.

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