Prevalence of Gestational Diabetes Mellitus (GDM) and its Outcomes in Jammu Region


Abstract

Introduction: The present study seeks to evaluate the prevalence and outcomes of gestational diabetes mellitus (GDM) from Jammu region.

Methods: During the period of study, women at 24th to 28th week of gestation were investigated for the presence of GDM according to Diabetes In Pregnancy Study Group India (DIPSI) guidelines. The maternal and fetal outcomes were recorded and compared with (a) non-diabetic control group and (b) non-interventional untreated GDM group.

Results: The overall prevalence of GDM was found to be 6.94%. In the untreated group, family history of diabetes was 24.19%, caesarean section 22.58% and preterm delivery 16.13%, whereas the prevalence of macrosomia was 16.2% and shoulder dystocia 6.45%. These figures were found to be significantly higher when compared to the data obtained from the treated GDM group which was as follows: caesarean section 8.5%, preterm delivery 4.2%, macrosomia 10% and shoulder dystocia 1.2%.

Conclusion: The study emphasizes the importance of screening for GDM and timely optimum intervention for a significant positive effect on both maternal as well as foetal outcomes in pregnancy. This also builds a strong case for adherence to DIPSI guidelines in diagnosis and management of GDM.

Introduction

Very little data is available from the Jammu region with regard to the prevalence of gestational diabetes mellitus (GDM). This is quite unbecoming considering the fact that a lot of research focus today is on the well being of mother and the newborn child in general and in the situation of GDM or diabetes mellitus in particular. The present study, therefore, attempts to elicit valuable inputs to fill this void and was based in Government Medical College Hospital, which is one of the largest public sector hospitals in north India catering to patients from different parts of the Jammu region.

In the Indian context, screening is essential in all pregnant women as the Indian women have eleven-fold increased risk of developing glucose intolerance during pregnancy compared to Caucasian women. The present study, therefore, has compiled authentic data regarding the prevalence of GDM from Jammu region and its effect on pregnancy outcomes.

The information, inferences and conclusions drawn from this study are expected to be pooled with similar information from other parts of country and thus prove vital in formulating effective and timely allocation of resources to improve pregnancy outcomes in diabetics and at the same time prevent morbidity and mortality in diabetic pregnant women and their offsprings.

The present study followed the DIPSI (Diabetes In Pregnancy Study Group India) guidelines for screening of our subjects so that a uniform common protocol followed by similar study groups in other parts of the country could enable a fair and judicious correlation with each other. Besides, DIPSI guidelines also facilitates both economical and feasible mode of evaluation. One of the important guideline of DIPSI was to put the GDM patient on treatment (MNT/MNT + Insulin Therapy). Unfortunately, some of the patients refused to follow this guideline because of the strong traditional belief that restriction of diet will effect the robust development of the fetus. We utilized this “default” group of patients for comparison with the patients who were put on treatment so as to see the effect of these two groups i.e. who received treatment with those who did not receive any treatment.

Material and Methods

The present prospective study was conducted on patients in chronological order attending the ante-natal clinics in the Department of Gynaecology and Obstetrics, SMGS Hospital in association with the Department of General Medicine, Government Medical College and Hospital, Jammu for a period of one year w.e.f. December, 2007 to November, 2008. During the period of study, subjects at 24th to 28th week of gestation were evaluated for presence of GDM according to DIPSI recommended method and followed-up to determine the outcomes of pregnancy as per predesigned proforma.

The inclusion criteria included pregnant women at 24th to 28th week of gestation, while cases pertaining to type 1 diabetes mellitus, urinary tract infection (UTI), major chronic diseases like carcinoma, tuberculosis and diseases leading to accumulation of fluid and appearance of protein in urine like congestive cardiac failure (CCF), renal failure and advanced liver failure were excluded from the present study.

Diagnosis of GDM: This criteria was established if 2-hour venous plasma glucose after 75-g of oral glucose load in fasting state ≥ 140 mg/dl.
Results

A total of 2025 subjects at 24 th to 28 th weeks of gestation, attending the antenatal clinics of Department of Gynaecology and Obstetrics, SMGS Hospital, Government Medical College, Jammu, were evaluated for GDM according to DIPSI recommended method. Out of 2025 subjects, 132 (6.51%) were diagnosed as GDM. This study group was divided into two parts: Group I were those who did not receive any treatment (n = 62). Group II were those who received treatment in form of MNT/MNT + Insulin Therapy (n = 70). One hundred forty (140) non-diabetic pregnant ladies were included as control in our study. Among the 70 GDM subjects who received treatment, 44 (61.91%) were put on MNT and 26 (38.09%) were put on MNT + Insulin Therapy.

Table 1 shows the characteristics of the study groups. There is no statistically significant difference in the mean age between the study groups. Mean SBP (p = 0.000001) and mean DBP (p = 0.000001) is higher in GDM patients who did not receive any treatment when compared to GDM patients who received treatment. Similarly, fasting blood group (p = 0.000005) and PP (p = 0.000) is higher in GDM patients who did not receive treatment when compared to those GDM patients who received treatment.

Table 2 shows the pregnancy outcome. Prevalence of low birth weight (LBW) babies were 8.2% in GDM without treatment mothers, 10% in GDM with treatment mothers and 14.3% in control group and difference did not reach any statistical significance. The prevalence of large babies > 4 kg was significantly higher in GDM without treatment group (p = 0.01, $\chi^2 = 5.19$) when compared to GDM with treatment. Also, it is higher in GDM without treatment group (p = 0.01, $\chi^2 = 4.53$) when compared to control group.

Proportion of ladies who underwent abortion is 2 (2.7%) in GDM ladies who were without treatment as compared to nil in GDM ladies with treatment and control groups and the difference is not statistically significant (p = 0.07). Caesarean section is significantly higher in GDM without treatment group (p = 0.02, $\chi^2 = 5.19$) when compared to GDM with treatment. However, it is higher in GDM without treatment group (p = 0.01, $\chi^2 = 4.53$) when compared to control group.

Prevalence of congenital anomalies, PROM and PP were no doubt higher in group not receiving any treatment but the difference did not reach any statistical significance.

Table 3 shows fetal outcomes in the study group. Prevalence of still birth and rDS is higher in GDM without treatment group but difference did not reach any statistical significance.

Prevalence of still birth is 16.13% in GDM ladies who did not receive any treatment (n = 62). Group II were those who received treatment in form of MNT/MNT + Insulin Therapy (n = 70). One hundred forty (140) non-diabetic pregnant ladies were included as control in our study. Among the 70 GDM subjects who received treatment, 44 (61.91%) were put on MNT and 26 (38.09%) were put on MNT + Insulin Therapy.

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Prevalence of still birth is 16.13% in GDM ladies who did not receive any treatment as compared to 4.2% in ladies who received treatment (p = 0.02, $\chi^2 = 5.19$).

Proportion of newborns with shoulder dystocia is higher in GDM ladies without treatment (6.45%) when compared to ladies who received treatment (1.4%) (p = 0.03, $\chi^2 = 4.45$).
Discussion

The present prospective hospital-based study, which was the first of its kind to be undertaken in this part of the country, showed the prevalence of GDM as 6.94%. GDM prevalence has been reported variably from 1.4 to 14% worldwide and differently among racial and ethnic groups. Prevalence is higher in Blacks, Latino, Native Americans and Asian women than White women. A similar study in Kashmiri women from same state gave a prevalence figure of 3.8%. Diabetes mellitus is an epidemically explosive problem which is increasing at an unstoppable pace. DIPSI guideline having suggested one time plasma sugar level as a measure to detect GDM is an attempt to preempt future possibility and predisposition for diabetes mellitus.

Our findings of this study are largely at tandem with those of literature at the national as well as international level. We, therefore, infer from the above study that Jammu region is, despite its varying ethnicity, food habits, terrain and living standard, very much a part of diabetes spectrum the worldover.

Secondly, treatment right after detection of GDM state is effective in stemming the adverse pregnancy outcomes largely in terms of preterm, macrosomia, gestational hypertension and shoulder dystocia which are statistically significant.

Still birth and RDS complications in pregnancy were not affected significantly which may be because of this being a hospital-based study where proper follow-up and patient care is excellent.

Compared with women of normal OGTT, women with GDM were older. Mean age ± SD in GDM group was 27.2 ± 2.3 years, while in control group it was 26.2 ± 2.3 years. Similar study from South India showed age > 25 years as a risk factor for GDM. This finding is in agreement with the result of other studies conducted in Indian subcontinent.

In our study, a significant proportion of subjects with GDM were overweight [19 (30.65%)] and obese [16 (25.8%)]. Study of prevalence of GDM in Southern Iran (Bander Aban City) showed that BMI of 25 kg/m² or more were significantly more prevalent in GDM subjects which is in accordance with the present study. GDM was seen to be least prevalent (3.23%) in underweight subjects (BMI < 18.5 kg/m²).

We observed family history of diabetes mellitus in significant proportion of cases i.e. 15 (24.19%). A study from Tamil Nadu also concluded that family history of diabetes was significant risk factor for GDM. This finding is in accordance with studies in Europe that showed positive family history of type-2 diabetes in majority of subjects with GDM.

Our study revealed that the most common complications seen in GDM mothers was gestational hypertension (6.45%), followed by postpartum haemorrhage (3%), abortion (2.7%) and premature rupture of membranes (1.6%). The prospective cohort study performed in 1,310 women in Iran showed the most common maternal complication was gestational hypertension (9.7%). Another study of 972 GDM mothers in Saudi Arabia showed that common complications were perineal tear (18%) that cause postpartum haemorrhage, followed by gestational hypertension (2%).

In the present study, 22.58% of non-intervention GDM ladies delivered via caesarean section while only 8.5% of treatment GDM ladies delivered via caesarean section and the difference between the two groups is statistically significant (p = 0.04). A research controlled trial was done which studied the effect of treatment on GDM pregnant ladies and found that induction of labour was less in treated group than in non-treated group (p < 0.001), however rate of caesarean section was same. Also, when non-intervention group was compared to control, again the difference is statistically significant (p = 0.04).

A Chennai based study of GDM ladies also shows that assisted deliveries were significantly higher among GDM group than controls (p < 0.001).

Our study demonstrated that 14.52% of newborns of GDM mothers in non-treatment group were macrosomia while the figure was 10% in treated group (p = 0.02, χ² = 5.19) and 7% in control population (p = 0.01, χ² = 4.53).

Most of the studies shows fetal macrosomia in 10-20% of infants born to GDM mothers. Asian Indian mothers also shows prevalence of large babies as 27.6% in GDM group.

In Australia based study, obstetric outcomes of 138 treated GDM ladies were studied and found that treated GDM had 8% macrosomic rate which was significantly less (p = 0.02) than rate of 17% in control population.

Similar results were obtained in USA based study where incidence of macrosomia was reduced in intervention group as compared to routine care group (10% vs 20%, p = 0.001).

Our study showed that prevalence of still birth and respiratory distress syndrome is 4.84% and 3.23% in untreated group while none in treated and control population. The difference between the two groups is not statistically significant. A similar study from Thailand showed incidence of respiratory distress syndrome as 4.9% and 1.2%, respectively.

Also, the prevalence of shoulder dystocia in untreated diabetic population was 9.6% which is significantly higher than in treated group (1.4%, p = 0.03) and control group (4%, p = 0.03). This is supported by a British-based study on GDM population where it was stated that in females who were treated for GDM, shoulder dystocia was significantly less common (odds’s ratio 0.40, 95% confidence interval 0.21-0.75).

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GDM is like a natural IGTT. DIPSI guidelines come out with a major breakthrough by detecting such state with single prick thereby facilitating a very quick and non-tedious method to pick out such conditions.

As many follow-up studies come in from various states in India and other third-world countries, this methodology can be integrated into national programme to detect GDM and stop its unfettered growth.

Conclusion

The study evidently proves the advantage of adhering to DIPSI guidelines in diagnosis and management of GDM for a significantly positive effect on pregnancy outcomes both in relation to mother as well the child.

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References


