

Universal screening and evaluation of high-risk factors for gestational diabetes mellitus (GDM) in patients attending antenatal OPD

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Abstract

Background: Hyperglycemia in pregnancy and gestational diabetes mellitus are becoming a significant public health issue globally and in India. Gestational diabetes mellitus increase the risk to pregnant women and newborns and leads to poor pregnancy outcomes. Although access to antenatal care has improved in the country, universal screening for gestational diabetes mellitus has not yet been operationalized across the country. Early diagnosis and appropriate management of disease is important to the health of women with GDM and their newborns. **Method:** This study was carried out in the department of obstetrics and gynecology at PDU medical college and hospital Rajkot, Gujarat from September 2019 to September 2021. **Result:** The study was conducted on 1000 cases, The prevalence rate of GDM in the study population of PDU medical college Rajkot was found to be 7.2%. 59.3% of cases belonged to the age group of 18-28 years. Most of the patients 39.6% in the study group belonged to lower socioeconomic background. The highest association of risk factor with GDM was found to be with obesity (BMI>25) and h/o recurrent abortions. Of the GDM positive patients 37.5% underwent caesarean section, 45.8% had vaginal deliveries, 6% patients had abortions and 11% patients were loss to follow up. Maternal complications were encountered in form of PPH in 6% cases. In this study amongst the screened positive 72% had live child, 11% had delivered a stillborn child, and in 6% cases abortion occurred. **Conclusion:** GDM is prevalent in Rajkot and now is being identified and detected early due to the implementation of 1000 days programme which includes routine universal screening of GDM at first antenatal visit. GDM is a high-risk pregnancy and proper prepregnancy counselling, proper antepartum care, intensive fetal surveillance and intrapartum care are required in patient with GDM to provide optimum maternal and fetal outcome.

Key Words: Gestational diabetes mellitus, screening, high risk, surveillance

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INTRODUCTION

Diabetes mellitus is the most common metabolic disorder of pregnancy. Gestational diabetes mellitus is carbohydrate

intolerance that begins or is first recognized during pregnancy.¹ Although the prevalence is usually reported as 2% to 5% of pregnant women, it can be as high as 14% in high-risk groups. These women are at risk of developing diabetes and related conditions later in life and face a range of complications during pregnancy.² The government of India has launched first 1000 days journey in which compulsory universal screening of GDM is to be done among all the patients during their first antenatal visit.⁶ Diabetes during pregnancy poses risks for both mother and fetus. There are range of complications.

The antepartum and intrapartum complications: Hypertension, Pre-eclampsia, Preterm delivery, IUGR, Abruption, Urinary tract infection,

The delivery and perinatal outcome can be affected in many ways:

Delivery outcome: Caesarean section, Instrumental vaginal delivery, Shoulder dystocia, Postpartum hemorrhage, Meconium-stained liquor, Malpresentation.

Perinatal outcome: Macrosomia, Apgar<7 at 1 minute, Prematurity syndrome, Hypoglycemia, Hypocalcemia, Hyperbilirubinemia, Congenital anomalies, early neonatal deaths.

While controversy still exists regarding the significance of GDM, there is now general acceptance that is associated with higher fetal and neonatal morbidity and mortality with an increased likelihood of children born to affected mothers developing childhood obesity and type 2 diabetes later in life.³

AIM:

Early detection of patient of GDM during their first antenatal visit with the help of universal screening test and to prevent the fetomaternal complications.

To analyze the association of high-risk factors in all screened patients with GDM.

To assess the fetomaternal outcome in all patients who appear positive on the screening test

METHOD: The present study is a hospital-based study carried out from. September 2019 to September 2021 at the department of obstetrics and gynaecology, PDU medical college Rajkot, Gujarat. During this period 1000 patients were considered amongst those attending antenatal patients who satisfied inclusion and exclusion criterion.

Inclusion criterion: All patients attending antenatal opd at first visit. Patient who give informed consent to participate in study

Exclusion criterion: Known diabetics who are/are not on oral antidiabetic or injectable drugs. Third trimester pregnancy. Refusal to participate on study.

As per national guidelines, each pregnant women must undergo Oral Glucose tolerance test at first antenatal visit during first trimester and if the test is negative then between 24-28 weeks. Pregnant women is given 75 gram glucose dissolved in 300 ml water, irrespective of the last meal and blood glucose is checked after 2 hours. If it is >140 mg/dl, she is GDM positive.^[7] After administration of 75 gram oral glucose the patient is assessed after 2 hours for blood glucose level by fully automated or semiautomated analyzer or with the help of glucometer.(as facility available).If the test is positive the patients treatment (MNT-hypoglycemic drug-insulin) is to be started as per guidelines and is assessed for fetomaternal outcome. If vomiting occurs within 30 minutes of oral glucose intake, the test has to be repeated the next day.^{4,5}

RESULTS

Out of 1000 cases studied, the prevalence rate was 7.2%

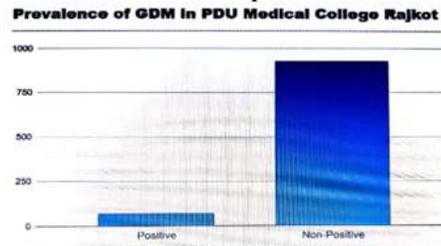


Figure 1

Table 1

Total Observation	Total Positive	Non-Positive	Positive Percentage
1000	72	928	7.2%

Out of total 1000 patients. 72 patients were found positive for GDM which constitutes to 7.2%

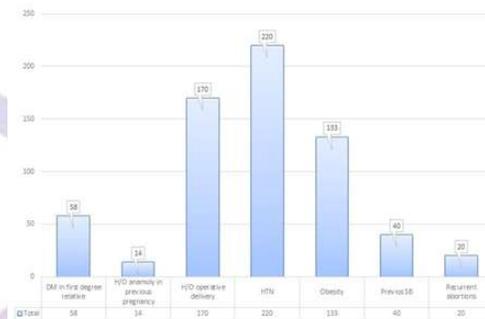


Figure 2

HIGH RISK FACTORS:

It shows 58 patients(5.8%) having family h/o DM in first degree relative, 40 patients(4%) having h/o previous Still birth child, 14 patients(1.4%) having h/o anomalous baby in previous pregnancy, 20 patients(2%) having recurrent abortions, 220 patients(22%) having hypertension, and 133(13.3%) patients having BMI> 25(obesity) and 170(17%) patients having history of operative delivery. And out of 1000 cases studied 78(7.8%) were loss to follow up after the first visit.

Association of high-risk factors:

1)Family history of DM:

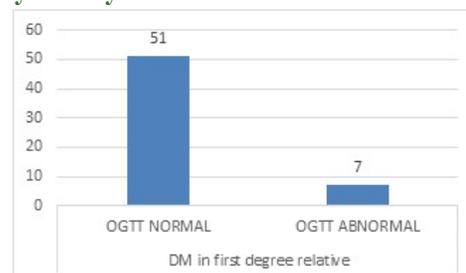


Figure 3

Total 58 cases were identified with family history of DM positive in first degree relative. In this high-risk group OGTT was found abnormal in 7 patients which were screened positive and labelled as GDM positive. There was 5.8% incidence of this high-risk factor in the study group. Out of 58 cases 12% were GDM positive.

2) BMI >25

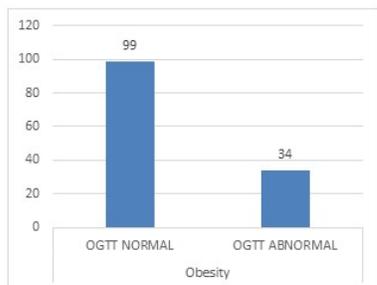


Figure 4

Total 133 patients were identified with BMI>25. In this high-risk group 34 patient were having abnormal OGTT and were taken as screen positive. There was 13.3% incidence of patients with BMI>25 out of my study population. Out of 133 cases 27.5% were GDM positive.

3)H/O previous still birth child

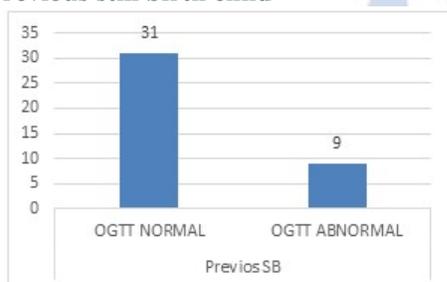


Figure 5

Total 40 patients were identified with a history of previous stillbirth child. In this high-risk group 9 patient were having abnormal OGTT and were taken as screen positive. There was 4% incidence of patients with history of previous still birth out of the study population. Out of 40 cases 22.5% were GDM positive.

4)H/O anomalous baby in previous pregnancy

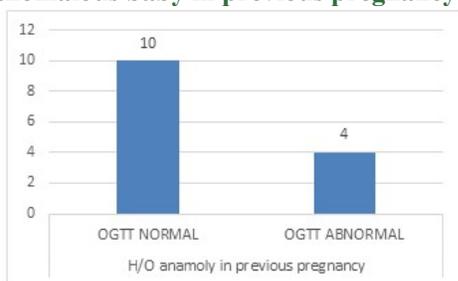


Figure 6

Total 14 patients were identified with a history of anomalous baby in previous pregnancy. In this high-risk group 4 patient were having abnormal OGTT and were taken as screen positive. There was 1.4% incidence of patients with history of anomalous baby in previous pregnancy out of this study population. Out of 14 cases 25.2% were GDM positive.

5)Hypertension

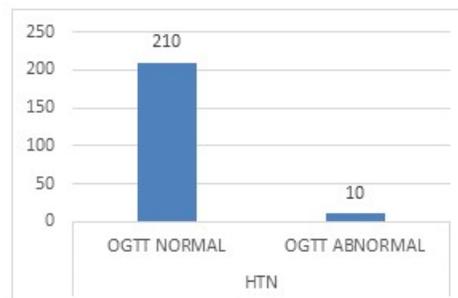


Figure 7

Total 220 patients were identified with hypertension. In this high-risk group 10 patient were having abnormal OGTT and were taken as screen positive. There was 22% incidence of patients having hypertension out of the study population. Out of 220 cases 4.5% were GDM positive.

6)Recurrent abortions



Figure 8

Total 20 patients were identified with having recurrent abortions. In this high-risk group 8 patient were having abnormal OGTT and were taken as screen positive. There was 2% incidence of patients having recurrent abortions out of the study population. Out of 20 cases 40% were GDM positive.

Maternal Outcome



Figure 9

Table 2

Outcome Classification	Patient	Percentage (%)
CS	27	37
Vaginal	33	46
Others (Abortion)	4	6
Loss to Follow Up	8	11

Out of the 72 patients who screened positive for GDM in the study group, 27 underwent caesarean section (37%), 33 vaginal deliveries (46%), 4 had abortions (6%) and 8 patients were loss to followup (11%).

Fetal outcome

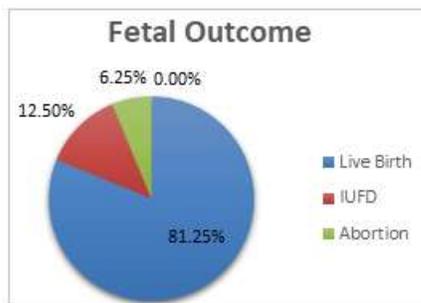


Figure 10

Out of the total 72 patients who were GDM positive 52 patients (72.2%) had live birth, 8 patients (11.1%) had delivered IUFD child, and 4 patients (5.5%) had abortions. Out of the 72 patients 4 were having anomalous babies out of which 2 were IUFD and 2 were live child.

DISCUSSION

So, this prospective study is done for universal screening of GDM and evaluation of high-risk factors in patients attending antenatal OPD and according to this study the following observations were obtained:

PREVALANCE

In this study out of the 1000 patients screened according to the DIPSI guidelines accepted by the government of Gujarat 72 patients were screened positive for GDM, that is 7.2% of pregnant women were diagnosed as GDM positive. In Zainab Groof *et al.* study the prevalence was 12.6%.⁹ In study in Italy by Graziano di cianni there was 12.3% prevalence rate of GDM.⁸ In a study conducted in peru (M.A *et al.*) the prevalence of GDM was 16%.¹⁰ In a study conducted in Rajasthan (Priyanka *et al.*) the prevalence rate was 6%.¹¹

AGE: In this study 59.3% patients belonged to age group 18-28 years. In Zainab *et al.* the mean age was 30 years.⁹ In the M.A *et al.* 51.5% patients belonged to 18-28 years.¹⁰ In Priyanka *et al.* the mean age was 25 years.¹¹

BMI: Of all the GDM positive mothers 51.3% and 5.5% were overweight and obese respectively. In Zainab *et al.* it was 15.7% and 17% overweight and obese respectively.⁹ In the M.A *et al.* 32% belonged to overweight and 15.6% belonged to obesity category.¹⁰ In the Priyanka *et al.* 67%

belonged to overweight and 10% belonged to obese group.¹¹

Hypertension

Of all GDM positive pregnancy induced hypertension was found to be 13.8% as compared to Zainab *et al.* which had 25.9%.⁹ In Priyanka *et al.* 27% patients had hypertension.¹¹

H/O of recurrent Abortions/Still-births

Considering h/o recuurent abortions as a risk factor, it has shown to be statistically extremely significant association of high risk factor for GDM, with a p value of 0.0001. in Zainab *et al.* this association was also significant with a p value of 0.029.⁹

Family history of diabetes

In this study there was shown to be less association with the family history of diabetes with a p value of 0.18. in Zainab *et al.* there was a significant association of GDM with family history of DM with a p value of 0.001⁹. In the M.A *et al.* study there was a significant association of GDM with family history of DM with p value of 0.05¹⁰. In Priyanka *et al.* the association between GDM and family history of DM was significant with p value <0.001.¹¹

Maternal outcome

In this study there was 37.5% rate of caesarean section amongst the GDM positive and a 45.8% rate of vaginal delivery. In Zainab *et al.* the caesarean rate was 48.1% and vaginal delivery rate was 51.9%.⁹ In the Priyanka *et al.* there was found to be 79% caesarean rate.¹¹

Fetal outcome

In this study there was a 4% rate of child having macrosomia and 61.5% rate of having preterm babies. In Zainab *et al.* there was 16.2% rate of macrosomia child and 20.7% rate of having preterm babies.⁹ In Priyanka *et al.* 18% rate was found for macrosomia.¹¹

In this study the NICU admission rate was 72.2% whereas in Priyanka *et al.* the NICU admission rate was only 27.7%.¹¹

In this study the rate of stillborn was 11.1% whereas in Priyanka *et al.* ^[18] the stillborn rate was 9%.¹¹

Patients having recurrent abortions have highest association with GDM followed by patients having obesity as a high risk factor

(recurrent abortions> obesity> history of anomalous baby in previous pregnancy)

- Out of the GDM positive patient 46% delivered vaginally and 37% delivered by a caesarean section.
- Out of the GDM positive patients 72% delivered a live child and 11% had an IUFD child and 5% had abortions.
- Out of the GDM positive screened 5% patient had anomalous baby.

CONCLUSION

GDM is prevalent in Rajkot and now is being identified and detected early due to the implementation of 1000 days programme which includes routine universal screening of GDM at first antenatal visit. Women with GDM are at an increased risk for adverse obstetric and perinatal outcomes. Maternal obesity, family history of DM, H/O recurrent abortions contribute majority to development of GDM.¹² Perinatal outcomes include preterm births, and congenital anomalies, and macrosomia. Maternal pre pregnancy overweight/obesity is a major yet a modifiable risk factor for GDM development. Overweight and obesity may be prevented by implementing a healthy lifestyle that includes physical activity and nutritional counselling before pregnancy. Prior studies have indicated that up to 50% of GDM cases can be attributed to maternal pre pregnancy overweight/obesity alone. Given the high prevalence of obesity among women of child-bearing age in Rajkot (51.3%) and its critical role in the development of GDM, there is an urgent need to develop strategies that aim at mitigating the overweight/obesity epidemic in Rajkot. Also, better understanding of the magnitude and risk factors of GDM in Rajkot is needed to develop preventive strategies that aim at improving maternal and child health and mitigate GDM. This investigation is the first to provide much needed long overdue epidemiological data on the nature of the GDM problem in Rajkot. In our study there is shown to be less association of GDM with H/O DM in first degree relative, which is different from other such studies, as self-reporting of information may also have been subject to some degree of reporting/recall bias. Possible limitations in our study include the cross-sectional nature of our study design which reduced our ability to infer temporal relationships between exposures and outcomes. From this study, we conclude that GDM is a high risk pregnancy and proper pre-pregnancy counselling,

proper antepartum care, intensive fetal surveillance and intrapartum care are required in patient with GDM to provide optimum maternal and fetal outcome.

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