

Study of factors associated with gestational diabetes in pregnant women at tertiary health care center

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Abstract

Background: Gestational diabetes mellitus is defined as any degree of glucose intolerance leading to a hyperglycemic state of variable severity, first recognition during pregnancy. Recently prevalence of diabetes is alarmingly high among Indian population. GDM is having high incidence of maternal and neonatal morbidity. The objective of our study was to study high risk factors in gestational diabetes mellitus. **Material and Methods:** This prospective, observational study included pregnant women attending antenatal OPD, admitted in labour room or in antenatal ward with abnormal glucose challenge test. **Results:** In our study with 110 patients, only 8.18 % patients were below 25 years age, rest 91.82 % were above 25 years age which is significant. Also 44.45 % patients were primigravida, rest were beyond primigravida. Family history of diabetes mellitus (32.73 %), history of pregnancy induced hypertension or pre-eclampsia (25.45 %), history of recurrent abortions 2 or more (16.36 %) were most common. In present pregnancy induced hypertension or preeclampsia (38.18%), obesity (32.73%), polyhydramnios (16.36%), recurrent infections (13.64%) were most common risk factors present in patients. High rate (39.09%) of caesarean sections were noted in our study. **Conclusion:** Various risk factors such as age more than 25 years, family history of diabetes mellitus, presence of hypertensive disorders of pregnancy, polyhydramnios, recurrent infections are commonly seen in patients with gestational diabetes mellitus.

Key Word: Gestational Diabetes Mellitus, Maternal Outcome, high risk factors, BMI more than 30

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INTRODUCTION

Gestational diabetes mellitus is defined as any degree of glucose intolerance leading to a hyperglycemic state of variable severity, first recognition during pregnancy, after 4-5 months of gestational age, no matter the treatment required or postpartum evolution¹. Glucose intolerance is mainly due to Insulin resistance, caused by metabolic

changes of late pregnancy, and the increased insulin requirements may lead to impaired glucose tolerance (IGT) or gestational diabetes². HAPO i.e. hyperglycemia and adverse pregnancy outcomes study (HAPO) was one of largest study on GDM involving 25, 505 pregnant women, showed that the risk of adverse maternal, fetal, and neonatal outcome increased than for normal pregnancy³. Recently prevalence of diabetes is alarmingly high among Indian population, but there have been few studies assessing the effect of diabetes on pregnancy outcomes. Maternal adverse outcomes in GDM can be pregnancy-induced hypertension, maternal infection, fasting hyperglycemia, increased chances of abortion, preterm labor, polyhydramnios, etc. While adverse fetal outcomes in GDM can be fetal congenital anomalies like neural tube defects, cardiac anomalies, fetal macrosomia, IUGR, trauma during delivery, unexplained fetal deaths, etc. Early neonatal respiratory distress syndrome, hypoglycemia, hypocalcemia, etc. complications can

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occur, also there is increased risk of future type 2 diabetes in mother as well as the baby⁴. Risk factors for gestational diabetes mellitus are age more than 30, BMI more than 30, excessive weight gain during pregnancy, a family history diabetes, history of still birth, previous child with congenital abnormality, pre-existing medical diseases such as hypothyroidism, etc⁵. It is essential to screen for GDM in pregnancy because glucose intolerance is associated with adverse maternal and neonatal outcomes and women with history of GDM, and their children are at risk of developing diabetes in future⁶. The objective of our study was to study high risk factors in gestational diabetes mellitus.

MATERIAL AND METHODS

This study was carried in the department of Obstetrics and Gynecology, XXXX hospital for a period of 1 year from XXX to XXX. Study design was prospective, observational type. Pregnant women attending antenatal OPD, admitted in labour room or in antenatal ward were screened accordingly. Pregnant women underwent detailed history taking and clinical examination for evaluation of risk factors for GDM. As per recommendation by World Health Organisation for assessment of GDM, patients were given 75 gm oral glucose and venous blood sample was collected after 2 hrs. As per WHO diagnostic criteria, pregnant women having 2 hrs. plasma glucose >140 mg/dl were diagnosed as GDM, value more than 200 mg/dl was labelled as overt diabetic, value less than 120 mg/dl were normal and values between 120-140 mg/dl were repeated again.

Inclusion criteria

1. Patients recently diagnosed as gestational diabetes mellitus.

Exclusion criteria

1. Patients with known diabetes before pregnancy
2. Patients having history of drug intake that affects glucose metabolism like corticosteroids, etc.
3. Patients with major chronic diseases like carcinoma, tuberculosis, congestive cardiac failure (CCF), renal failure, and liver failure, co-existent surgical illness, etc.
4. Patients not willing to undergo screening and diagnostic test

Total 350 pregnant women were eligible women were included in this study. Prior informed consent was taken from patients. All the patients were closely followed during antenatal, intrapartum period. A standard proforma was used, and details such as age, body weight at booking visit, family history of Diabetes, medical and obstetric history, comorbidities (hypertension, hypothyroidism etc.), maternal vitals, mode of delivery and details of the new-born, such as birth weight, gestational age (GA) at

delivery, mode of delivery, APGAR score at 1 and 5 minutes, NICU admission >24 hrs., other metabolic events (hypoglycemia, hyperbilirubinemia, hypocalcemia etc.) were recorded. Any complications if occurred during these periods were recorded.

RESULTS and DISCUSSION

Characteristics in patients with gestational diabetes mellitus			
Age wise distribution			
1	18 – 25 years	9	8.18
2	26 – 30 years	35	31.82
3	31 – 35 years	39	35.45
4	36 years and more	27	24.55
Gravida wise distribution			
1	Primi	49	44.55
2	Second	28	25.45
3	Third	24	21.82
4	Fourth and more	9	8.18
Significant history			
1	Family H/o DM	36	32.73
2	H/O PIH/ Preeclampsia	28	25.45
3	H/O still birth	12	10.91
4	H/O recurrent abortions	18	16.36
5	H/O Unexplained neonatal loss	7	6.36
6	H/O congenital anomalies in previous baby	11	10
7	Past H/O Macrosomia	8	7.27
Significant findings			
1	PIH /Preeclampsia	42	38.18
2	Obesity (BMI > 30)	36	32.73
3	Polyhydramnios	18	16.36
4	Recurrent Infections	15	13.64
5	Preterm Labour	11	10
6	Malpresentations	8	7.27
7	IUGR	5	4.54
Mode of delivery			
1	Vaginal	67	60.91
2	LSCS	43	39.09

It is a well-known fact that early diagnosis and appropriate management of gestational diabetes mellitus can improve both maternal and fetal outcome. Appropriate management can be diet, exercise, oral hypoglycemic drugs and insulin. While diet and exercise are must for each case, use of oral hypoglycemic drugs and insulin depends on control of glycemic status. Early diagnosis is essential, then only appropriate management is useful. Knowledge of high-risk factors is necessary for early diagnosis. In our study with 110 patients, only 8.18 % patients were below 25 years age, rest 91.82 % were above 25 years age which is significant. Also 44.45 % patients were primigravida, rest were beyond primigravida. Maternal age is an established risk factor for GDM, but there is no consensus on age's relation to increased risk of GDM⁷. ADA recommended the lowest cut off of ≥ 25 years to screen for GDM as early as possible⁸. Some factors in patient's medical and obstetric history are known to be high risk for suspicion of

gestational diabetes mellitus. In our study multiple factors were present in individual patients. Family history of diabetes mellitus (32.73 %), history of pregnancy induced hypertension or pre-eclampsia (25.45 %), history of recurrent abortions 2 or more (16.36 %) were most common among them. Other factors such as history of still birth, history of unexplained neonatal loss, history of congenital anomalies in previous baby, history of macrosomia in previous babies were also noted in patients. These findings are similar with meta-analysis by Lee *et al*⁹, they found that, multiparity ≥ 2 , previous history of GDM, congenital anomalies, stillbirth, abortion, preterm delivery, macrosomia, having concurrent PIH, PCOS, age ≥ 25 , BMI ≥ 25 , and family history of diabetes are the significant risk factors predictive of GDM in current pregnancy. family history of diabetes (particularly in a first-degree relative) increases the risk for GDM as per systemic review by Zhang C *et al*¹⁰. Onset of GDM has a familial tendency and this potentially suggests that there is a genetically predisposition to develop GDM¹¹. In present pregnancy induced hypertension or Preeclampsia (38.18%), obesity (32.73%), Polyhydramnios (16.36%), Recurrent Infections (13.64%) were most common risk factors present in patients with gestational diabetes mellitus. Other risk factors such as Preterm Labour (10%), Malpresentations (7.27%), IUGR (4.54%) were also noted. Similar high-risk factors are given in NICE guidelines¹². High rate (39.09%) of caesarean sections were noted in our study. Presence of gestational diabetes mellitus with multiple high-risk factors might be the cause for this. It indicates that gestational diabetes mellitus contributed to increased maternal and fetal morbidity due to these all risk factors.

CONCLUSION

Various risk factors such as age more than 25 years, family history of diabetes mellitus, presence of hypertensive disorders of pregnancy, polyhydramnios, recurrent infections are commonly seen in patients with gestational diabetes mellitus. Universal screening with glucose challenge test along with considering all above risk factors is helpful in early diagnosis of gestational diabetes mellitus. It will help to start appropriate

treatment at an early gestational age and thus reducing maternal and fetal morbidity.

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