IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 19, Issue 4 Ser.2 (April. 2020), PP 30-33
www.iosrjournals.org

Prevalence, Risk Factors Of Gestational Diabetes Mellitus And Its Outcome In Nalanda Medical College, Patna.

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Abstract
Aim-*Gestational Diabetes Mellitus(GDM)is a metabolic disorder defined as glucose intolerance with onset or first recognition during pregnancy.These women are at increased risk of adverse maternal and fetal outcome.Therefore,it's early diagnosis and management is essential for better fetomaternal outcome.*
This study was done to assess prevalence of GDM on the basis of Diabetes in pregnancy study group India(DIPSI) criteria and to study the risks factors and outcome in patients attending the antenatal clinic at Nalanda medical college and hospital,Patna.
Materials and Methods- *This study was carried out on 500 patients attending the antenatal clinic from January 2018 to december 2019.They were given 75gm glucose irrespective of meals and after 2hours plasma glucose was estimated.GDM was diagnosed when after 2hours plasma glucose was>140mg/dl.All patients with GDM were followed up and treated with diet and /or insulin therapy till delivery.Maternal and fetal risks factors and outcome were evaluated.*
Result*-Prevalence of GDM was 8.2% in my study. Many of the cases diagnosed as GDM had previous history of large baby,still birth or spontaneous abortion.Maternal complications observed were PIH(48.7%),polyhydramnious(2.4%),while 34.1% had to undergo caesarean section.14.6% babies had birth weight of >3.5kg and 29.2 % were below 2.5 kg.*
Conclusion- *Women with GDM showed an increased risk of obstetrical and fetal complications. Estimation of plasma glucose level using DIPSI criteria is a single step and cost -effective test to screen large number of cases and to diagnose and manage GDM to prevent maternal and fetal complications.*
Keywords: *gestational diabetes mellitus,glucose intolerance,DIPSI.*

Date of Submission: 23-03-2020 Date of Acceptance: 10-04-2020

I. Introduction

Gestational Diabetes Mellitus is defined as carbohydrate intolerance of variable severity with onset or first recognition during the present pregnancy (ACOG 2013); irrespective of treatment with insulin or not.(1)
India leads the world with the highest number of diabetics, earning the dubious distinction of the diabetic capital of the world(2). Prevalance varies between 1 to 14% in different studies conducted in different parts of India. Gestational diabetes mellitus is a medical condition complicating pregnancy, and in the face of the rising prevalence of diabetes, particularly in women of child bearing age. Women with GDM are at increased risk for adverse obstetric and perinatal outcome. Hence, it is imperative that an early detection and management of the disease is done to ensure better maternal and fetal outcome .
The factors that influence prevalence of gestational diabetes mellitus are ethnicity, race and socioeconomic status of the population under study. Prevalence is higher in Blacks, Latino, Native Americans and Asian women than in white women. The risk factors for gestational diabetes mellitus are age >30 years, family history of diabetes mellitus, obesity, history of macrosomia, previous unexplained neonatal death, unexplained recurrent abortion, Previous congenital malformations, history of hydramnios, history of stillbirth, history of gestational hypertension and history of pre-eclampsia.(3) Teenage mother who drank alcohol were less likely to have gestational diabetes mellitus.(4)

II. Material And Methods

A Prospective hospital based study of 500 pregnant women attending antenatal clinic between JANUARY 2018 TO DECEMBER 2019 of Department of Obstetrics and Gynecology at NALANDA MEDICAL COLLEGE and HOSPITAL,PATNA. Screening was done by DIPSI criteria i.e,75 gms of glucose was given irrespective of meal and their plasma glucose was estimated two hours later. If plasma glucose was>=140mg/dl after two hours GDM was diagnosed. 500 pregnant women with singleton pregnancies between 24 to 28 weeks of gestation who had come for antenatal checkup were informed about the nature of study and written informed consent were taken. Using questionnaire,data were collected regarding

age,gravida,BMI,Detailed history of risk factors like family history and previous obstetric history were taken,examination were done. We excluded subjects with known cardiac, liver or renal diseases. Each mother was given 75gm oral glucose dissolved in 200ml of water to drink in a non-fasting state and after two hours venous blood was collected. Patients with plasma glucose value >140mg/dl were labelled as GDM and rest as NGT(normal glucose tolerance).GDM patients with 2hours blood glucose level <200mg/dl were given dietary and lifestyle modification advice for 2weeks , followed by subsequent 2-h postprandial blood sugar (PPBS) testing after 2 weeks . It should be maintained below <120 mg/dL. If 2-h PPBS remains≥120 mg/dL, then the patients were referred to physician for insulin therapy. Maternal complications such as gestational hypertension, polyhydramnious, Abruptio placentae , preterm labour,mode of delivery,delivery complications and fetal outcome such as birth weight ,apgar score ,NICU admission were recorded and analysed. All the women with GDM were called for a postnatal checkup after 6 weeks where they were reviewed and were offered fasting and postprandial blood sugar levels.

III. Result

Out of 500 patients screened, 41 were diagnosed with GDM(8.2%).Blood Sugar was controlled in most of the patients by diet and moderate exercise(64%). Rest needed insulin therapy with diet and exercise. Majority (43.9%, n= 18) were of age group 25-30 year. The second largest age group was of person aged 20-25 year (29.2 %, n= 12) followed by >30 year (21.9%, n= 9), greater than <20 year age group (4.8%, n= 2).Table 1 showed that the proportion of the patients in the age group 25-30 years (43.9%) were significantly higher than other age group (Z= 6.57; p<0.001). Table 2 shows that the majority (73.1 %, n=30) were Multigravida. Test of proportion showed that there was higher proportion of Multigravida (73.1%) than Primigravida (26.8%) (Z= 2.19; P< 0.05). Table 3 shows that the BMI,Majority (46.3%, n= 19) had BMI of >25 followed by 19-25 (43.9%, n= 18), and <19(9.75%, n=4).Most of the patients (46.3%) were overweight (Z=10.03; p<0.0001). Table 4shows that majority of cases 18(43.9%) had previous history of abortion and 16 (39%) had unexplained still birth. Family history of diabetes mellitus was present in 5 number of cases (12.1%) and history of fetal weight>3.5 was found in 2 cases(4.8%).

Table 5 shows that majority of cases 20(48.7%) had PIH. Abruptio placentae was observed in 10 cases (24.3%),Chronic HTN & Preterm labour occurred in 1 case each(2.4%).No complications were observed in 8 cases(19.5%). Table 6 shows that Spontaneous vaginal delivery occurred in majority of cases 22 (53.6%) while 14 (34.1%) cases had to undergo LSCS. Assisted Vaginal delivery accounted for 12.1%.Test of proportion showed that the proportion of the patients in the mode of spontaneous vaginal delivery(53.6%) were significantly higher than other. (Z= 4.29; p<0.001). Table 7 shows that 4 (9.75%) subjects had PPH in the study and shoulder dystocia occurred in 1 (2.4%)case only.Test of proportion showed that the proportion of the patients in delivery outcome PPH (9.75%) were significantly higher than shoulder dystocia. (Z= 2.179; p<0.001).

Table 8 shows that birth weight between 2.5-3.5 kg were observed in 23 babies(56.0%), birth weight < 2.5 kg in 12 babies(29.2%), while 6 (14.6%) had birth weight >3.5kg respectively. APGAR score at<7 in 1 minute was observed in 3 babies (7.3%) and NICU admission in 2 (4.8%).Test of proportion showed that the proportion of the babies with the Birth weight 2.5-3.5 (56.0%) were significantly higher than other. (Z= 7.12; p<0.001).

Table 1: Distribution of subjects according to their age

Age (in years)	Number of Cases	Percentage (%)
<20 years	2	4.8
20 - 25	12	29.2
25 - 30	18	43.9
>30	9	21.9

Table 2: Distribution of subjects according to Parity

Gravida	Number of Cases	Percentage (%)
Primigravida	11	26.8
Multigravida	30	73.1

Table 3: Distribution of subjects according to BMI

BMI	Number of Cases	Percentage (%)
<19	4	9.75
19-25	18	43.9
>25	19	46.3

Table 4: Distribution of subjects according to Risk Factors

Serial No.	Risk factors	Number of Cases	Percentage (%)
1	Previous history of abortion	18	43.9
2	Family history of Diabetes mellitus	5	12.1
3	Unexplained still birth	16	39
4	History of Fetal weight>3.5kg	2	4.8
5	Previous history of congenital anomalies	None	0

Table 5 : Distribution of subjects according to Complications

Complications	Number of Case	Percentage (%)
PIH	20	48.7
Polyhydramnious	1	2.4
Abruptio placentae	10	24.3
Chronic HTN	1	2.4
Preterm labour	1	2.4
No complication	8	19.5

Table 6: Distribution of subjects according to Mode of Delivery

Mode of Delivery	Number of Cases	Percentage (%)
SVD	22	53.6
LSCS	14	34.1
Assisted Vaginal delivery	5	12.1

Table 7: Distribution of subjects according to Delivery Complications

Delivery outcome	Number of Cases	Percentage (%)
PPH	4	9.75
Shoulder dystocia	1	2.4

Table 8: Distribution of subjects according to Perinatal outcome

Serial No.	Perinatal outcome	Number of Cases	Percentage (%)
1	Birth wt > 3.5 kg	6	14.6
2	Birth wt 2.5-3.5kg	23	56.0
3	Birth wt< 2.5 kg	12	29.2
4	APGAR < 7 in one minute	3	7.3
5	NICU Admission	2	4.8

IV. Discussion

This is a prospective hospital based study showing prevalence of GDM to be 8.2%.Overall prevalence of GDM varies between 7-14% in various regions of India. Study conducted in 2013 by P.Kalra et al[(5)] from Rajasthan evaluated the prevalence of gestational diabetes using diabetes in pregnancy Study Group India (DIPSI) criteria and further assess its feto-maternal outcome in western Rajasthan. The prevalence of GDM in this study was 6.6%.Study done by Rajput et al[(6)] in from Haryana reported 7.1%prevalence. Interestingly most of the studies from south India have reported higher prevalence, Study done by V. Balaji,C. Anjalakshi[(7)] in 2011 assesed the validity of Diabetes in Pregnancy Study Group India (DIPSI) guidelines, a modified version of the WHO criterion to diagnose gestational diabetes mellitus (GDM). It identified 196 women (13.4%) as GDM.Present studies found prevalence of 8.2% which compares well with the other studies.Majority (43.9%, n= 18) were of age group 25-30 year. Study done by R Joy[(8)] found their mean age to be 28.6 years ,while P Kalra[(5)]reported their average age to be 27.1years.

Majority (73.1 %, n=30) were Multigravida. Study by Rajput M [(9)] in 2014 was undertaken in rural women of Haryana,Women with gravida ≥3 had significantly higher prevalence of GDM.

Majority (46.3%, n= 19) had BMI of >25.Most of the patients (46.3%) were overweight (Z=10.03; p<0.0001). A study in 2018 by Egbe TO[1], Ngowe MN[(10)] found that GDM was associated with BMI≥30 kg/m^2 (OR 6.2 : 95% CI 2.9-13.1, P<0.001). Other studies Das et[(11)] al and Bhat M[(12)] have also found higher BMI in their studies.

On comparison of risks factors we found majority of cases 18(43.9%) had previous history of abortion and 16 (39%) had unexplained still birth. Family history of diabetes mellitus was present in 5 cases (12.1%)

and history of fetal weight>3.5 kg was found in 2 cases(4.8%). A Study on Pregnancy Outcome of Women With Gestational Diabetes in a Tertiary Level Hospital of North India by PikeeSaxena, Swati Tyagi[13] in year 2011 concluded that the family history of diabetes (18%), history of spontaneous abortions(14%). A study was undertaken by Rajput [M(9)] in 2014 also found that Positive family history of diabetes had significantly higher prevalence of GDM. History of macrosomia (birth weight ≥4 kg) was significantly associated with prevalence of GDM (P = 0.002). On multiple logistic regression analysis, risk factors found to be significantly associated with GDM.

Majority of cases 20(48.7%) had PIH. Abruptio placentae was observed in 10 cases (24.3%) ,Chronic HTN & Preterm labour occurred in 1case each(2.4%).No complications were observed in 8 cases(19.5%). A study in 2011 by P Saxena[13] observed the incidence of pregnancy-induced hypertension(40%) and polyhydramnios(20%) were more in diabetic pregnancies.Study in 2013 done by P Kalra[5] showed the prevalence of PIH was 36.4%.

Spontaneous vaginal delivery occurred in majority of cases 22(53.6%) while 14(34.1%) cases had to undergo LSCS. Assisted Vaginal delivery accounted for 12.1%.Study by P Saxena[13] observed that 42% of diabetic pregnancies (*n*=21) had to undergo a caesarean operation. Study in 2017 by Sathiamma P,Karunakaran[14] had a statistically significant higher incidence of induction of labor about (37.2%), caesarean section (58.96%).

Birth weight between 2.5-3.5 kg were observed in 23 babies(56.0%), birth weight < 2.5 kg in 12 babies(29.2%), while 6 (14.6%) had birth weight >3.5kg respectively. The table shows that APGAR score at<7 in 1 minute was observed in3 babies (7.3%) and NICU admission in 2 (4.8%). A Study by P Saxena[13] showed mean birth weight for neonates of diabetic mother was 3.1±0.9 kg. Congenital anomalies were also significantly more in neonates of diabetic mothers and were not noted in neonates of nondiabetic pregnancies. There were more babies with respiratory distress in the study group (10%) and greater number of intrauterine deaths.

V. Conclusion

There is increased risk of adverse maternal as well as fetal outcome in women with GDM. Early diagnosis and treatment is very effective in improving maternal and fetal outcome, therefore universal screening for GDM should be offered to all pregnant women by using DIPSI criteria

Screening using DIPSI criteria is a single cost effective and convenient procedure which is diagnostic for GDM.

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Dr.Swastika Jayaswal,etal. "Prevalence, Risk Factors Of Gestational Diabetes Mellitus And Its Outcome In Nalanda Medical College, Patna." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 19(4), 2020, pp. 30-33.