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Comparative study of antenatal complications in pregestational and gestational diabetes mellitus

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I. INTRODUCTION:

Diabetes is a chronic disease that occurs when the pancreas is no longer able to make insulin, or when the body cannot make good use of the insulin it produces.[1] Gestational Diabetes Mellitus (GDM) is defined as carbohydrate intolerance of variable severity with the onset or first recognition during pregnancy.[2] Pregestational diabetes mellitus is characterized by chronic hyperglycemia and other disturbances of carbohydrate and lipid metabolism along with increased incidence of microvascular as well as macrovascular complications.[3]

All women have a 50-60% decrease in insulin sensitivity as the pregnancy progresses. [4] Normal pregnancy is considered to be a diabetogenic state characterized by exaggerated rate and amount of insulin release, associated with decreased sensitivity to insulin at cellular levels.

This study was designed to compare the antenatal complications in pregestational and gestational diabetes mellitus in terms of urinary tract infection, vaginal candidiasis and gestational hypertension/preeclampsia.

II. METHOD:

The present study was a prospective observational cross sectional study conducted in the Department of Obstetrics and Gynecology Kamla Nehru State Hospital for mother and child, IGMC Shimla for a period of one year.

Two groups were formed and women with pre-existing diabetes mellitus ,whether type1 or type 2, were included in the pregestational diabetes mellitus group (Group DM) based on their Fasting Blood Sugar, Post Prandial Blood Sugar and Random Blood Sugar. Criteria for labeling pregestational diabetes mellitus was based on the ADA classification[5]

FPG ≥ 126 mg/dL (7.0 mmol/L). Fasting is defined as no caloric intake for at least 8 h.

OR

2-h PG ≥200 mg/dL (11.1 mmol/L) during OGTT. The test should be performed as described by the WHO, using a glucose load containing the equivalent of 75-g anhydrous glucose dissolved in water.

OR

A1C ≥ 6.5% (48 mmol/mol). The test should be performed in a laboratory using a method that is NGSP certified and standardized to the DCCT assay.

OR

In a patient with classic symptoms of hyperglycemia or hyperglycemic crisis, a random plasma glucose ≥200 mg/dL (11.1 mmol/L)

The group GDM consisted of women with Gestational Diabetes Mellitus. All women attending the Antenatal OPD were subjected to a 75gm oral glucose tolerance test (75gmOGTT). In this test 75 gm anhydrous glucose was given after dissolving in approximately 300 ml of water , irrespective of their last meal timing which should have been completely ingested within 5-10 minutes. [6] Venous blood was drawn after 2 hours. The plasma glucose values was estimated in the hospital laboratory by the Glucose oxidase-peroxidase method. Patients were classified according to the DIPSI criteria.[7]

DIPSI criteria – Plasma glucose level <120 mg/dl -Normal

121-139 mg/dl- Gestational Glucose Intolerance

140-199 mg/dl- Gestational Diabetes Mellitus

Subjects with plasma glucose levels between 140-199 mg/dl were included in this study

A proforma containing general information on demographic characteristics and antenatal complications in terms of urinary tract

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infections , vaginal candidiasis and gestational hypertension/Preeclampsia. The final maternal outcome was noted. The whole data collected was then analyzed.

Statistical Analysis: Association between categorical variables was analyzed by Chi-square test and continuous variable by independent sample t-test. For all statistical tests, p value <0.05 was considered statistically significant.

III. OBSERVATION

Table 1: Association Between Group and UTI in current pregnancy (n = 299)

UTI	Group			Fisher's Exact Test	
	DM	GDM	Total	$\chi 2$	P Value
Yes	6 (10.7%)	19 (7.8%)	25 (8.4%)		
No	50 (89.3%)	224 (92.2%)	274 (91.6%)	0.498	0.434
Total	56 (100.0%)	243 (100.0%)	299 (100.0%)		

In our study, 10.7% of the subjects with DM had UTI in comparison with 7.8% of the subjects with GDM.

There was no significant difference between the various groups in terms of distribution of UTI ($\chi 2$ = 0.498, p = 0.434).

Table 2: Association Between Group and Vaginal Candidiasis in current pregnancy (n = 299)

Vaginal Candidiasis	Group			Fisher's Exact Test	
	DM	GDM	Total	$\chi 2$	P Value
Yes	11 (19.6%)	13 (5.3%)	24 (8.0%)		
No	45 (80.4%)	230 (94.7%)	275 (92.0%)	12.594	0.001
Total	56 (100.0%)	243 (100.0%)	299 (100.0%)		

In our study 19.6% of the subjects with DM had Vaginal candidiasis in the current pregnancy in comparison to 5.3% of the subjects with GDM.

Table 3: Association Between Group and GHTN/Preeclampsia in current pregnancy (n = 299)

GHTN/Preeclampsia	Group			Chi-Squared Test	
	DM	GDM	Total	$\chi 2$	P Value
Yes	14 (25.0%)	66 (27.2%)	80 (26.8%)		
No	42 (75.0%)	177 (72.8%)	219 (73.2%)	0.108	0.742
Total	56 (100.0%)	243 (100.0%)	299 (100.0%)		

In our study 25% of the subjects with DM developed GHTN/Preeclampsia in the current pregnancy in comparison to 26.8% subjects with GDM.

IV. DISCUSSION

Urinary Tract Infections, Vaginal Candidiasis and GHTN/Preeclampsia

	UTI (%)	Vaginal Candidiasis(%)	GHTN/ Preeclampsia(%)
Mustary F et al[8]			
DM	13	28	14
GDM	15	12	20
Naher N et al[9]			
DM	2		
GDM	12		
Perveen Fareed et al[10]			
GDM			44

Priyanka Kalra et al[11] GDM		8	27
Rajesh Kumari et al[12] GDM	8.8	4.7	13.5

In our study there was an increased incidence of urinary tract infections and vaginal candidiasis in the Group DM whereas Group GDM had an increased incidence of pregnancy induced hypertension (GHTN/Preeclampsia).

Similar conclusion was drawn by the study conducted by Mustary F et al[8] .In the study conducted by J.G Ray et al [13] the subjects in the group with pregestational diabetes mellitus were at an increased risk of GHTN/Preeclampsia in comparison to the group GDM.

Pregnancies complicated with diabetes, pregestational or GDM, had an increased incidence of maternal complications in the antenatal period as concluded by the studies conducted by Naher N et al[9], Perveen Fareed et al[10], Priyanka Kalra et al[11], and Rajesh Kumari et al[12].

V. CONCLUSION

Diabetes in pregnancy is in itself a high risk pregnancy resulting in adverse maternal outcomes, pregestational diabetes more so in comparison with GDM. The type of diabetes plays a crucial role in the antenatal complications and maternal outcome of that pregnancy. With a better understanding of this and ensuring better facilities to equip ourselves in case of such complications, we can provide better maternal health care.

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