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TO ASSESS RELATIONSHIP BETWEEN DIABETES IN PREGNANCY OR GESTATIONAL DIABETES MELLITUS (GDM) AND LIPID PROFILE.

Gynaecology

Dr. Gauthami Munireddy (MS OBG), II Yr Post graduate, Dept. of Obstetrics & Gynaecology, Yenepoya Medical College, Mangalore, Karnataka.

Dr. Annie Rajaratnam.* Associate Professor, Dept. of Obstetrics & Gynaecology, Yenepoya Medical College, Mangalore, Karnataka. *Corresponding Author

ABSTRACT

Diabetes in pregnancy or Gestational Diabetes Mellitus (GDM) is defined as carbohydrate intolerance that begins or is first recognized during pregnancy.GDM induces a state of dyslipidemia consistent with insulin resistance. The prevalence of GDM varies directly with the prevalence of Type 2 Diabetes Mellitus (DM) in a given population. The aim of our study was to determine the exact alterations in lipid profile in GDM women using the Diabetes In Pregnancy Study Group India (DIPSI) criteria.76 patients in the age groups of 18-35 yrs were selected in our prospective observational study. GDM was diagnosed if a 2 hr venous glucose sample was >140mg/dl. If DIPSI was negative, it was repeated again at 24-32 weeks. In conclusion our study showed that serum triglyceride (TG) and Very Low Density Lipoproteins (VLDL) levels were significantly higher and High Density Lipoprotein (HDL) levels were decreased in GDM patients.

KEYWORDS

Gestational Diabetes Mellitus, Lipid profile, Dyslipidimea

Introduction:

Diabetes in pregnancy or Gestational Diabetes Mellitus (GDM) is first recognized during pregnancy and induces a state of dyslipidemia. The enhanced insulin resistance and altered oestrogen progesterone ratio are responsible for the wide range of dyslipidemic conditions.[1] The prevalence of GDM varies directly with the prevalence of Type 2 DM in a given population. In Indians the average is 15% in age group of 15-19 years and 32% in age group of 30 years and above.[2] The screening and diagnosis of GDM is done using many methods recommended by different study groups. The DIPSI criteria is suitable for Indian studies as the incidence of GDM is higher in Indian population and a one step approach by DIPSI is economical and feasible.[2] The pregnant women show physiological changes to support the fetal growth which is associated with changes like rise in plasma lipids i.e. rise in plasma triglycerides (TG) and cholesterol. But this is not atherogenic. The same changes are exaggerated in the GDM which is atherogenic. Severe hypertriglyceridemia during pregnancy can lead to acute pancreatitis in 1 in 12000.[3]

Materials and methods:

This prospective observational study was carried out on 76 pregnant women in the antenatal clinic of the Obstetrics department of a tertiary care centre in Mangalore from August 2016 to June 2017. All the cases irrespective of their gestational age who fulfil the inclusion and exclusion criteria were counselled about the study and a written Informed consent was taken from them. Their demographic data, history and investigations were also recorded. Additionally lipid profile was estimated by the glycerol phosphate method in those with abnormal DIPSI.

INCLUSION CRITERIA:

Age-18 - 35years

Pregnancy diagnosed with GDM either newly detected or on follow up by DIPSI criteria as follows: 75g glucose was given to the pregnant women at their first ANC (Ante natal check-up) visit irrespective of the gestational age .

GDM was diagnosed if a 2hr venous glucose sample was >140mg/dl.

If DIPSI was negative, it was repeated again at 24- 32weeks. If patients had a high DIPSI value then GTT and HBA1C test was also done.

EXCLUSION CRITERIA:

Women with hypertensive disorder and pre eclampsia at the time of registration.

Overt diabetics

Those with a history of hyperlipidemia, thyroid and renal disorders, lupus and antiphospholipid antibody (APLA) syndrome.

Results:

Table 1: Correlation between DIPSI and Fasting Lipid profile.

	DIPSI	GCT	HBA1C	TG	CHO	HDL	LDL	VLDL
Count	26	19	14	46	46	46	46	46
Mean	158.3846	173.6842	7.064286	232.6957	200.7391	51.13043	99.97826	45.58696
Median	146.5	170	6.95	223.5	201	51.5	100.5	45
Min	133	142	5.4	142	118	27	27	28
Max	408	236	10	442	281	74	174	68
SD	52.05926	22.55131	1.081742	64.79433	34.63167	10.93945	28.30115	9.956742

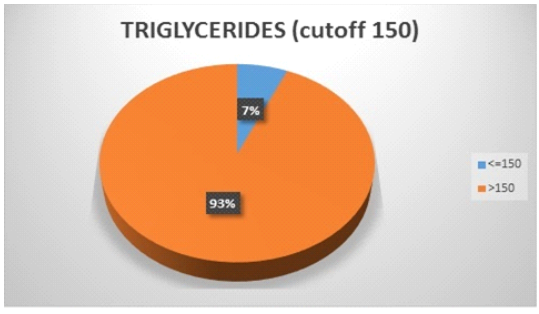


fig 1: triglycerides are more than 150mg/dl in 93% of gdm patients,which is of statistical significance.

Table 1 explains the correlation between DIPSI and Fasting Lipid profile. **Fig 1** show Triglyceride values are more in 93% of the GDM cases. In **Fig 2** Total cholesterol levels are more than 200mg/dl in 52% cases. **Fig 3** HDL values are below 40 mg/dl in 17% cases. **Fig 4** shows Low Density Lipoprotein (LDL) levels are above 100 mg/dl in 50% of GDM patients, equal in non diabetics too. **Fig 5** depicts VLDL levels above 30mg/dl in 93% cases All the above data were found to be statistically significant.

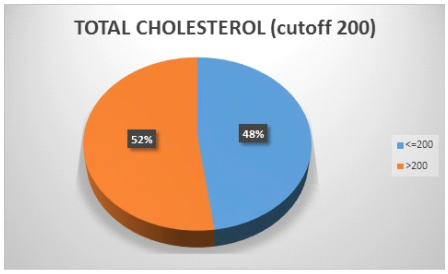


fig 2: total cholestrol levels are more than 200mg/dl in 52% patients.

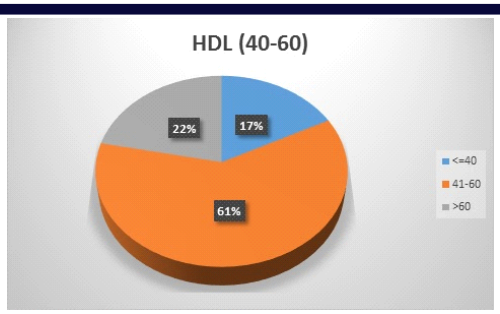


fig 3: HDL are below 40mg/dl in 17% patients

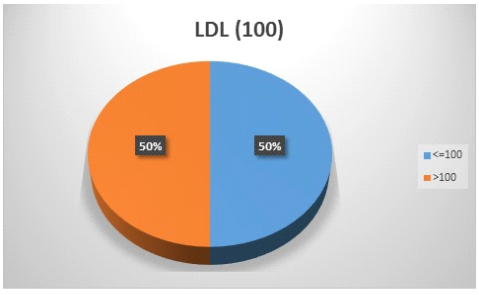


fig 4: LDL levels are above 100mg/dl in 50% gdm patients,which is of statistical significance.

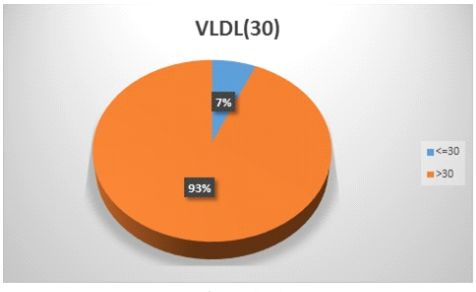


fig 5: VLDL levels are above 30mg/dl in 93%,which is of statistical significance.

Discussion:

The present study reveals that in GDM there were significantly increased triglycerides, cholesterols (CHO) and low density lipoproteins, LDL / HDL ratios, and decreased HDL concentrations. This was similar to a study by Savvidou et al who found GDM women had higher TG, cholesterol, LDL levels, and lower levels of HDL in an univariate analysis.[4] Emet et al did not observe positive associations between GDM and any lipid profile changes, but in patients with glucose intolerance, decreased CHO and LDL concentrations and increased TG concentrations were detected.[5] With regard to each lipid marker, some case control studies and prospective studies suggested associations between higher TG concentrations and GDM, but other studies had different findings.

Maternal CHO levels were found either unchanged or higher. Maternal LDL concentrations were also reported to be unchanged or increased. Rizzo et al did not find any differences in the concentration of any of the plasma.[6] Conflicts in findings among the studies mentioned earlier may be due to a variety of reasons, including study design, sample size, confounders, variations in population characteristics, and diagnosis criteria of GDM. The TG concentrations were negatively correlated with LDL size, and small dense LDL particles are reported to be more susceptible to lipid oxidation than larger particles. Therefore, some researchers postulated that oxidative stress, secondary to dyslipidemia, may ultimately cause it and have also suggested that chronic hyperglycemia may impair β- decreased insulin gene expression and impairment of insulin secretion. Thus, additional studies are needed to clarify the relationship between GDM and dyslipidemia and pregnancy outcomes.[7]

In view of increasing evidence that obesity, diabetes and cardiovascular diseases in later life may have prenatal antecedents, investigation of the determinants of intrauterine environment and fetal growth have become an important area of research. Variation of birth weight is strongly determined by neonatal fat mass, and it is likely that fetal growth disorders might also result from variations in maternal and fetal lipid metabolism. In non-diabetic pregnancies, maternal triglycerides (TG's) have shown correlation with birth weight.[8]

Likewise maternal serum triglycerides are predictive factors for large for gestational age infants with gestational diabetes mellitus.[9] High maternal TG levels in the first term of pregnancy were associated with higher birth weights and subsequently a higher occurrence of infants large for gestational age, whereas low TG levels were associated with an accelerated postnatal growth.[10]

Conclusion:

Our study showed beyond doubt that serum triglyceride (TG) and Very Low Density Lipoproteins (VLDL) levels were significantly higher and High Density Lipoprotein (HDL) levels were decreased in GDM patients. Thus lipid profile should be included as an integral part in the evaluation of GDM

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