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Original Research Article

STUDY OF SERUM LIPID PROFILE IN NORMAL PREGNANT WOMEN

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Introduction

Pregnancy is associated with many metabolic changes in mother .Due to this reason maternal physiological,Biochemical,Haematological parameters change drastically. If pregnancy goes without any complications, these changes are reversible after delivery[1]. As pregnancy advances, there is increased demand of energy for growing fetus. Pregnant women require an additional energy of 300Kcal/day over routine energy intake[2]. The average glucose utilized by a growing fetus at the third trimester reaches approximately to 33µmol/kg/min[3]. Normal pregnancy is associated with increased insulin resistance. Due to insulin resistance in mothers, there is more utilization of fats than carbohydrates for energy by mother and carbohydrates are spared for fetus. Thus it serves as physiological adaptation of the mother to ensure adequate carbohydrate supply for the rapidly growing fetus[4]. Elevated insulin level is associated with development of dyslipidemia in the form of elevated serum triglycerides, Total cholesterol and LDC-C while decreased level of HDL-C[5]. Presence of dyslipidemia leads to many maternal complications such as gestational diabetes mellitus ,pre-eclampsia & foetal complications such as macrosomia ,IUGR, Preterm birth[6] etc. Mothers with such complications are at higher risk of developing Diabetes mellitus cardiovascular diseases, atherosclerosis, hypertension in later life[7].

Present study was conducted to evaluate changes in serum lipid profile during different trimesters of pregnancy.

Aims and Objectives

This study was conducted to compare changes in maternal serum lipid profile normal pregnant females of first , second and third trimester with normal non pregnant females. Thus the aim of the study is to evaluate triglyceride and lipoprotein concentration in antenatal period and find out a cost effective and sensitive method for early detection and prevention of pregnancy related complications like gestational diabetes mellitus ,pre-eclampsia & fetal complications such as

macrosomia ,IUGR, Preterm birth etc. and future chronic illnesses in mother like Diabetes Mellitus, cardiovascular diseases.

Materials And Methods :-

The present study ''study of serum lipid profile in normal pregnant woman'' has been conducted in Dept. of Biochemistry, Laheriasarai, Darbhanga Medical College, Darbhanga during the period of April 2017 to March 2018. Lipid profile which included Total cholesterol, Triglycerides,HDL-C, LDL-C, & VLDL-C was studied in the following group of individuals.

(i) Control group-Normal healthy non-pregnant woman of age group of 18-40 years.

(ii)Study group-Comprising of normal pregnant women in first, second and third trimesters of Pregnancy of 18-40 years age group.

Total no. of cases studied were 40 from normal healthy non pregnant women and 40 cases each from first, second, third trimester of normal pregnant women.

In control group normal healthy woman having normal menstrual cycle without any evidence of any chronic diseases were included. They were with the same age distribution as the pregnant women. Control group subjects were selected from amongst healthy attendants of admitted patients and paramedical staffs.

Study group was selected from the patients admitted in the Dept. of obstetrics and Gynaecology , DMCH ,Darbhanga .They were normotensive.

Study group were divided in first ,second & third trimester groups according to their gestational ages.

Blood samples were drawn from all subjects following a fasting of 12 hours and analyzed for serum Triglycerides(TG) serum total cholesterol(TC) , VLDL – cholesterol, LDL – Cholesterol ,and HDL-cholesterol.

Serum triglycerides was estimated by GPO – PAP endpoint assay (span diagnostic kits)

serum Total cholesterol was estimated by CHOD-PAP method with ready to use diagnostic kits (Span diagnostic kits).

Serum HDL-C was estimated by PEG-CHOP-PAP endpoint assay with lipid clearing factor.

Serum VLDL was calculated as 1/5 th of Serum Triglycerides.

Serum LDL-C was calculated by Frederickson – Friedwalds formula according to which

LDL-C = TC- (HDL-C+VLDL-C).

Data was statistically analysed by student T Test and significance was expressed in terms of P value. The P value < 0.05 was considered statistically significant.

OBSERVATIONS :-

Comparison of parameters among study groups :-

Period of Gestation		**First Trimester (n=40)**	**Second Trimester (n=40)**	**Third Trimester (n=40)**	**Normal Healthy Non pregnant female(control) (n=40)**
Serum Triglycerides(mg/dl)	**Mean/SD T-Test(p)**	**112 ± 26.69 p<0.001**	**116.74 ± 25.91 p<0.001**	**163.14 ± 20.21 p<0.001**	**91.20 ± 26.19**
Serum Total Cholesterol (mg/dl)	**Mean/SD T-Test(p)**	**217.49 ± 41.40 p<0.01**	**234.56 ± 11.80 p<0.01**	**258.76 ± 15.36 p<0.01**	**165.97 ±26.19**
Serum	**Mean/SD**	**63.49 ± 14.65**	**50.13 ± 7.55**	**45.37 ± 7.24**	**46.89 ± 6.02**

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HDL-C (mg/dl)	**T-Test(p)**	**p<0.001**	**p= 0.01-0.05**	**p>0.05**	
Serum LDL-C (mg/dl)	**Mean/SD T-Test(p)**	**131.21 ± 26.73 p<0.001**	**162.52 ± 12.56 p<0.001**	**182.99 ± 13.58 p<0.001**	**97.88 ± 18.90**
Serum VLDL-C (mg/dl)	**Mean/SD T-Test(p)**	**22.94 ± 6.00 p<0.001**	**24.53 ± 5.49 p<0.001**	**32.48 ± 3.99 p<0.001**	**18.24 ± 5.75**

DISCUSSION:-

Pregnancy is associated with marked changes in maternal physiology and metabolism. These changes are due to alteration in various hormonal levels[8]. Elevated levels of progesterone, estrogen, HPL etc. leads to alteration in insulin signaling pathway causing a state of insulin resistance[4]. This insulin resistance causes dyslipidemia.

Age is one of the factors which causes change in serum lipid profile[9]. In the present study age matched cases and control were taken to remove this confounding factor. In our study we found elevated serum total cholesterol, serum TG and LDL-C in pregnant women than non-pregnant women. This finding is in accordance with studies done by Parchwani D et al(10), Pusukuru (11) R et al, Sonagra (12) A.D. et al.

Insulin resistance leads to production of TG rich VLDL particles by liver which causes increased TG in such persons(13).In this condition cholesteryl esters transfer protein (CETP) transfer more TG molecules from VLDL to HDL in exchange of cholesteryl ester. Due to this there is formaton of TG rich and cholesteryl ester poor HDL particle which has shorter lifespan than normal HDL particles.Thus serum HDL declines(14).HDL also causes reverse cholesterol transport in our body. Thus decline in HDL is associated with elevated total cholesterol and LDL levels (15). There is increased need of cholesterol in pregnancy due to elevated steroid hormone synthesis. Therefore, in pregnancy serum total cholesterol and LDL-C are elevated. In our study also we found as pregnancy advanced dyslipidemia increased. In our study Serum HDL-C rose in the first trimester ($P<0.001$) but underwent fall in second trimester and further decreased during third trimester ($P>0.05$).

SUMMARY & CONCLUSIONS:-

Normal pregnancy is associated with increased insulin resistance as there is increase in pregnancy related hormones . Insulin resistance leads to dyslipidemic changes in mother in the form of elevated TG, TC,LDL-C, and decreased HDL-C in serum , which can complicate pregnancy and increase maternal and fetal mortality. Thus dyslipidemia must be identified and mothers should be advised for necessary dietary and lifestyle modifications. Pregnancy is associated with altered lipid profile was first shown by Becquerel and Radier(16) in1845. Chiang(17) et al (1995) found increase in TG level 2-3 times in pregnant compared to non-pregnant women.

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