

LIPID PEROXIDES AND TRIGLYCERIDES IN PREGNANCY

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SUMMARY

This study was undertaken to determine the levels of serum total lipid peroxide, lipid peroxides of lipoprotein fractions and serum triglycerides in control subjects and pregnant women with different trimesters and toxemia of pregnancy.

The level of serum total lipid peroxide and lipid peroxides of high density lipoprotein (HDL) were found to be significantly increased during different stages of normal pregnancy as compared to control subjects ($P < 0.001$).

Among the three trimesters of pregnancy of women with third trimester of pregnancy showed maximum elevation in the levels of serum total lipid peroxide and lipid peroxide of high density lipoproteins (HDL) as compared to control subjects. No change was observed in the concentration of low density (LDL) and very low density (VLDL) lipoproteins in the subjects with different trimesters of pregnancy. However in pregnancy with toxemia the levels of lipid peroxide of LDL fraction showed significant rise as compared to controls.

The levels of triglycerides showed a significant increase in different trimesters of pregnancy and toxemia of pregnancy as compared to control subjects ($P < 0.0001$).

INTRODUCTION

In pregnancy various biochemical systems are affected. The presence of growing

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fetus, formation of placenta and the secretion of hormones cause a number of metabolic changes in the mother.

The auto-oxidation of polyunsaturated fatty acids (PUFA) leads to the formation of lipid peroxides. Increase in lipid peroxide levels diverts the metabolic pathways. In the field of obstetrics and gynaecology it may be related to the so called toxemia of pregnancy i.e. disorders encountered during pregnancy or early in the pregnancy. Toxemia of pregnancy might be due to some metabolic disorder and the senility of the placenta can be regarded as a model for the phenomenon of ageing (Minoru, 1978).

Free radicals are produced during normal metabolism and are normally efficiently scavenged. Oxidative stress occurs when there is an imbalance between production and scavenging of free radicals.

Uncontrolled lipid peroxidation may contribute to certain disease processes via disruption of membrane lipids and other cell components, (Kagan et al 1988). When they leak from the organ or tissues to blood stream the lipid peroxide levels in the serum and plasma increases.

Pregnancy induced hypertension (PIH) in some of the commonest obstetric problem even though the disease is known since Hippocrates. A number of reports indicate that blood levels of lipid peroxidation product are elevated in women with preeclampsia relative to normal pregnancy and it has

been suggested that lipid peroxidation may play a role in the etiology of the disease (Minoru, 1978).

Maternal hypertriglyceridemia is one of the most striking and consistent change occurring during pregnancy in both humans, (Knopp et al 1978) and experimental animals (Bosch et al 1967).

From this it is evident that assessment of levels of serum lipid peroxides and triglycerides in normal and abnormal pregnancies may help to the treating obstetrician directly or indirectly in preventing or foreseeing the probabilities of complications.

MATERIAL AND METHOD

The present study has been carried out in the department of Biochemistry, Dr. V.M. Medical College and General Hospital, Solapur. Total number of cases studied were 180 including controls.

For control group non-pregnant healthy women were selected. The study group included pregnant women in different trimesters and the patients with toxemia of pregnancy. All the above subjects were between the age group of 20 to 35 years.

Serum total lipid peroxide was estimated by the method of (Kei Satoh, 1978) using tetramethoxy propane (MDA) as a standard. Lipoprotein fractions were separated by the precipitation methods (Onomogbu and Levis, 1976). Lipid peroxide of lipoprotein fractions were estimated by the method of (Kei Satoh 1978). Serum triglyceride levels were estimated enzymatically by GPO method.

RESULTS

Table 1
**SHOWS THE MEAN VALUE OF SERUM TOTAL LIPID PEROXIDE,
 LIPID PEROXIDES OF LIPOPROTEIN FRACTIONS AND SERUM
 TRIGLYCERIDES IN CONTROLS AND PREGNANT SUBJECTS**

	Control (Mean + SD) 40	Ist Trimester (Mean +SD) 40	IInd Trimester (Mean+SD) 40	IIIrd Trimester (Mean +SD) 40	Toxemia of Pregnancy (Mean+SD) 20
1) Serum total lipid Peroxides (n mol MDA/ml)	0.83+0.18	1.28+0.14**	2.02+0.34**	2.83+0.27**	3.92+0.39**
2) Lipid peroxides of HDL fraction (n mol MDA/ml)	0.43+0.10	0.73+0.15**	1.58+0.32**	2.41+0.28**	0.26+0.05
3) Lipid peroxides of LDL fraction (n mol MDA/ml)	0.22+0.07	0.28+0.04*	0.24+0.07*	0.23+0.04*	3.42+0.43**
4) Lipid peroxides of VLDL fraction (n mol MDL/ml)	0.18+0.09	1.27+0.99*	0.19+0.07*	0.19+0.05*	0.22+0.06*
5) Serum Triglycerides (mg%)	90.7+15.2	102+16.6**	152+13.3**	210+11.3**	273+29.3**

* P>0.05 (N.S.)

** P<0.001

DISCUSSION

Specific aim of the present study was to determine any alterations in serum total lipid peroxide, lipid peroxides of lipoprotein fractions and serum triglycerides and their significance in different trimesters of

normal pregnancy and toxemia of pregnancy.

Levels of total lipid peroxide, lipid peroxides of HDL fraction and triglycerides showed highly significant increase (P<0.001) in different trimesters of pregnancy as compared to controls (Table I).

The overall plasma triglyceride removal capacity by maternal tissue decreases as gestation advances; this is a probable explanation for increase in levels of triglycerides in the present study. Quinto et al (1967) reported the decreased concentration of unsaturated fatty acids in pregnancy. The present study signifies that the unsaturated fatty acids liberated from triglycerides have possibly changed into lipid peroxidation. Placental tissue acts as a major source of lipid peroxidation product in pregnancy.

The levels of lipid peroxide of HDL and VLDL fraction showed no significant change ($P > 0.05$), whereas total lipid peroxide, lipid peroxides of LDL fraction and triglycerides showed maximum elevation in the patients with toxemia of pregnancy as compared to normal pregnant women (Table I).

Our findings of increase in total lipid peroxide in pregnancy are consistent with that of Minoru Ishihara (1978), Nishimura et al (1968) and Kawakami et al (1968).

Toxemia of pregnancy is associated with an imbalance between lipid peroxides and antioxidants. The imbalance is correlated and progressively favours the lipid per-

oxide with severity of toxemia of pregnancy. Thus the study signifies that the increased levels of serum lipid peroxides and triglycerides correlate well with the severity of complications of pregnancy. Therefore, the determination of the levels of lipid peroxides of LDL and triglycerides may be used as an index for the assessment of toxemia of pregnancy.

The determination of the levels of lipid peroxides of LDL and HDL will be helpful for the differential diagnosis of toxemia of pregnancy from those of non-toxic pregnancy.

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