



LIPID PROFILE CHANGES IN HYPERTENSIVE DISORDERS OF PREGNANCY

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ABSTRACT Hypertensive disorders is one of the most common medical complications affecting 5-10% of all pregnancies. Preeclampsia is multisystem disease of unknown etiology unique to pregnancy with the onset after 20 weeks of gestation. It is characterized by hypertension and proteinuria. It is a leading cause of maternal and perinatal morbidity and mortality world wide.

AIM: To analyse the lipid profile in normal pregnant women and the lipid profile changes in women with preeclampsia

MATERIALS AND METHODS: Serum lipid profile of 100 women with preeclampsia was compared with serum lipid profile of normotensive women.

RESULTS: The mean HDL, total cholesterol, LDL, VLDL and triglyceride levels are elevated in women with preeclampsia than in normotensives.

KEYWORDS : Preeclampsia, Lipid Profile.

INTRODUCTION:

Endothelial cell dysfunction is a key feature in the pathogenesis of preeclampsia. The similarity between the lesions of preeclampsia and atherosclerosis has led to speculations of a common pathophysiological pathway. An abnormal lipid profile is known to be strongly associated with atherosclerotic cardiovascular disease and has a direct effect on endothelial cell activation. Abnormal lipid metabolism seems to be important in the pathogenesis of preeclampsia too.

Normal human pregnancy results in a pronounced physiologic hypertriglyceridemia involving a gestational rise in blood triglycerides and cholesterol. Serum triglycerides and LDL concentrations in women with preeclampsia were higher than those in women with uncomplicated pregnancy.

During the first half of normal pregnancy, increased maternal fat accumulation (relative anabolic state) is presumed to be important for the subsequent hypertriglyceridemia normally occurring in later gestation (relative catabolic state). Circulatory concentrations of VLDL & LDL normally increase with gestational age as reflected by marked increases in serum triglycerides and cholesterol. The hypertriglyceridemia is due primarily to enhanced entry of triglyceride rich lipoproteins (esp VLDL) into the circulation rather than to diminished removal. Estrogen may play a major role in the lipoprotein patterns seen in human pregnancy although LDL cholesterol is more influenced by the combined effect of increased estrogen and progesterone. Additionally placental lipoprotein lipase activity normally increases as term approaches.

OBJECTIVES:

1. To describe the changes in lipid profile in preeclampsia
2. To compare the lipid profile in hypertensives and in normotensives

MATERIALS AND METHODS:

Fasting blood samples were taken from 100 pregnant patients with Preeclampsia and 100 normal pregnant women, admitted in ASRAM Hospital for safe confinement. Estimation of lipid profile was done by semi automated analyser. Results were analysed statistically.

INCLUSION CRITERIA:

- 1) Pregnant women in the third trimester diagnosed as PIH with no other associated complications.
- 2) Normal women in the third trimester of pregnancy with no other maternal medical complications, admitted for safe confinement.

EXCLUSION CRITERIA:

1. Chronic hypertension
2. Pregestational Diabetes mellitus
3. Nephrotic Syndrome
4. Cardiac Disease.

5. Hepatic Disease.
6. Twin pregnancy
7. Any medications except for vitamins and minerals.
8. Smoking
9. Ethanol use
10. Labour contractions
11. Thyrotoxicosis.

Results:

- The women with Preeclampsia were grouped as Group I (Study Group).
- The normal pregnant women were grouped as Group II (Control Group).

The results of the study were analysed as follows

The results were analysed between group I and group II according to the age distribution, booked / unbooked status, body mass index, total cholesterol, HDL, VLDL, LDL and triglycerides.

TABLE 1: AGE

GROUPS	No. OF PATIENTS	MEAN AGE (Yrs)	S.D.	S.E. OF MEAN
GROUP I	100	25.1700	2.816	0.28817
GROUP II	100	24.6100	3.03147	0.30315

There is no significant change in the age distribution between the two groups.

TABLE-2 AGE DISTRIBUTION

AGE IN YEARS	GROUP I		GROUP II	
	NO. OF CASES	%	NO. OF CASES	%
< 20	3	3	6	6
21 - 25	53	53	56	56
26 - 30	42	42	34	34
31 - 35	2	2	4	4
TOTAL	100	100	100	100

Table-2 BOOKED /UNBOOKED

BOOKING STATUS	GROUP I		GROUP II	
	NO. OF CASES	%	NO. OF CASES	%
Booked	92	92	92	92
Unbooked	8	8	8	8
Total	100	100	100	100

$p = 100$; $\chi^2 = 0.000$ Not significant

Table - 3 Comparison Of Bmi Between The Two Groups

GROUP	NO. OF CASES	MEAN BMI	S.D.	S.E. OF MEAN
GROUP I	100	26.2080	3.39511	0.33951
GROUP II	100	24.710	2.52602	0.25260

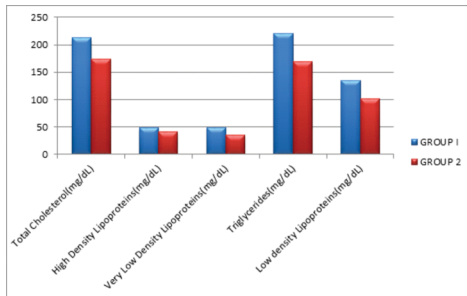
$p = 0.001$ Significant

INFERENCE

It is found that, patients preeclampsia (Group I) had high BMI than their normal counterparts (Group II)

Table 4: Comparison Of Mean + Sd Of Serum Lipid Profile Among Preeclampsia And Normotensives

VARIABLE	GROUP I	GROUP 2	p- value
Total Cholesterol(mg/dL)	212.64 ±53.10	173.7 ±41.7	0.000
High Density Lipoproteins(mg/dL)	48.02 ±9.7	41.26 ±9.3	0.000
Very Low Density Lipoproteins(mg/dL)	48.94 ±18.36	35.58 ±11.18	0.000
Triglycerides(mg/dL)	220.46 ±62.97	169.20 ±56.92	0.000
Low density Lipoproteins(mg/dL)	135.24 ±45.83	101.67 ±38.76	0.000



DISCUSSION:

There is no significant change in the age distribution between the two groups. 53% of the patients in Group I and 56% of patients in Group II were in the age group of 21 - 25 years. Only 2% of patients in Group I and 4% of patients in Group II were in the age group of 31 - 35 years. The booking status of both the study group and the control group were the same, 92% being booked and 8% being unbooked. It is found that, patients with preeclampsia (Group I) had high BMI than their normal counterparts (Group II). The mean total cholesterol level is higher in group I than in Group II. The mean HDL levels are higher in Group I compared to Group II. The mean VLDL values are higher in Group I compared to Group II. The mean triglyceride levels show a significant rise in Group I compared to that of Group II. The mean LDL levels are also increased in Group I compared to that of Group II.

COMPARISON OF THE LIPID PROFILE ANALYSIS IN VARIOUS STUDIES

	TGLS	LDL	HDL
Ray et al.	↑	-	-
Carl Hubel et al	↑	-	-
Sattar et al	↑	↑	-
Kaaja et al	↑	↑	↓
Present study	↑	↑	normal

CONCLUSION:

There exists a consistent positive association between elevated maternal triglyceride and the risk of preeclampsia. Given that the maternal hypertriglyceridemia is a common feature of the metabolic syndrome, interventional studies are needed to determine whether pre-pregnancy weight reduction and dietary modification can lower the risk of preeclampsia.

The matter of whether triglycerides share a causative relationship with preeclampsia should be expanded to the study of other lipoprotein particles and microparticles, as well as a detailed analysis of the microvascular bed of the delivered placenta. The collection of blood specimens in early pregnancy measuring concentrations of insulin, glucose and inflammatory markers, alongside anthropometrics assessment and then followed by a thorough assessment of clinical outcomes through a large cohort study might optimally address the role of triglycerides and the metabolic syndrome in the causation of preeclampsia.

Clearly, there is a need to establish whether preconception dietary modification, such as adoption of a Mediterranean diet among obese

women, can reduce the future risk of preeclampsia and other placenta mediated diseases, including placental abruption and foetal intrauterine growth restriction.

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