CASE STUDY OF SERUM LIPID PROFILE IN PREGNANCY INDUCED HYPERTENSION IN JMC, JHALAWAR.

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Article Info: Received 15 January 2019; Accepted 06 February 2019
Cite this article as: Jat, D. N. R., Gupta, D. R., & Gupta, D. A. (2019). CASE STUDY OF SERUM LIPID PROFILE IN PREGNANCY INDUCED HYPERTENSION IN JMC, JHALAWAR. Journal of Biomedical and Pharmaceutical Research, 8(1).
DOI: https://doi.org/10.32553/jbpr.v8i1.571
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Conflict of interest statement: No conflict of interest

ABSTRACT:

Only one group was investigated for serum lipid profile in third trimester of pregnancy in which included all PIH patients admitted in labor room in Department of Obstetrics in Jhalawar Medical College and was substantially compared with the normal values of Lipids in women. In this study we investigate the role of lipid profile in PIH. LDL value increase, HDL value decrease, TG value increase and VLDL value increase in PIH patients and also TG: HDL ration increased significantly in PIH patients. Dyslipidemia mediated activation of endothelial cells to placentally derived endothelial disturbing factors like lipid peroxides and trophoblastic components as possible contributors for pathogenesis of PIH. Thus assessment of blood lipids may be helpful in preventions of complications in PIH.

Key Words: Bloodlipids, PIH, Dyslipidemia, Triglycerides, Low Density Lipoprotiens, High Density Lipoprotiens.

INTRODUCTION

Pre-eclampsia, a non cancel convulsive form of pregnancy induced hypertension accounts for a significant proportion of maternal and fetal morbidity and mortality¹. Over 100,000 women develop eclampsia per year. Eclampsia contributes 16% of maternal mortality on a national basis which is equivalent to about 4500 maternal death in one year. The risk of developing eclampsia appears to be greater in women who have family history of essential hypertension and their may also be a relationship between risk of preeclampsia and the metabolic syndrome². Pre-eclampsia when complicated with convulsion is called eclampsia. The disorder complicates approximately 5 to 7 percent of pregnancies³-⁵. Severe PIH is associated with substantial risk for the foetus these include intrauterine growth restriction death and prematurity with attendant complications where as the mother is at risk of renal failure, pulmonary edema, stroke and death. Despite considerable
research the cause or causes of pre-eclampsia remain unclear and there are no clinically useful screening tests to identify women in whom it will develop\(^6\). Early pregnancy dyslipidemia is associated with an increased risk of severe PIH\(^7\). The association of alteration of serum profile in pregnancy induced hypertension is well documented. In PIH patient an abnormal lipid profile is known to be strongly associated with atherosclerotic changes and direct effect on endothelial dysfunction. The most important feature in toxaemia of pregnancy in hypertension which is supposed to be due to vasospastic phenomenon in kidney, uterus, placenta and brain\(^8\). Altered lipid synthesis leading to decrease in PGI2: TXA2 ratio is also supposed to be important way of pathogenesis in PIH. Abnormal lipid metabolism seems important in pathogenesis of PIH\(^9\).

**Objective:** To analyse the lipid profile values in Pregnancy Induced Hypertension patient.

**Need of Study:** Simple measurement of serum lipid parameters may be of good predictive value in toxaemia of pregnancy, avoiding the costly endocrinal investigations. The assessment of blood lipids may be helpful in prevention of complications in PIH.

**Study Period:** 01 Nov. 2017 to 30 April 2018.

**Sample size:** 60 pregnant women of 3rd trimester with PIH.

**Methodology** - Random blood sugar samples were taken from 60 pregnant patients with Pregnancy Induced Hypertension (PIH)

The samples were subjected to analysis of lipid profile.

**Specimen** - Freshly collected plasma. Anticoagulant used was EDTA.

**Procedure** - The lipid profiles of the samples were determined using a semiautomated analyser.

**Study Design:** Case Control Study.

**Inclusion Criteria**

Pregnant women in the third trimester diagnosed as PIH with no other associated complications.

**MATERIALS & METHODS**

The study was performed in the department of biochemistry of medical college and hospital, JMC Jhalawar. All subjects were in age group of 18-35 years with low socio-economic status and dietary habits. They were not abstained from smoking and alcoholism.

No subject of PIH was suffering from any acute or chronic illness during study nor they had any post history of cardiac, renal, hepatic dysfunction or dyslipidaemia.

In PIH all patients were studied who had BP more than 140/90 mm of Hg, proteinuria, oedema in third trimester of pregnancy.

**Data collection technique:** Study was performed in department of Biochemistry in JMC Jhalawar. Blood sample drawn from all subjects at the time of admissions and analyzed for serum triglycerides (TG), serum LDL, serum VLDL and serum HDL. Data were statistically analyzed by student’s “t” test and significance was expressed in term of “P” value.

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| Lipid Value   | Reagents                                           |
|---------------|----------------------------------------------------|
| Total Cholesterol | Cholesterol Oxidase, Peroxidase                   |
| HDL Cholesterol | Phosphotungstate / Magnesium precipitation        |
| LDL Cholesterol | Catalase / cholesterol esterase / cholesterol oxidase |
| Triglycerides   | Glycerol Phosphate oxidase/ Peroxidase            |
Table: 2 Reference values of the lab

| Lipid Value      | Reference values       |
|------------------|------------------------|
| Total Cholesterol| 125 - 200 mgs / dl     |
| HDL Cholesterol  | 30 - 65 mgs / dl       |
| LDL Cholesterol  | 85 - 130 mgs / dl      |
| Triglycerides    | 25 - 200 mgs/dl        |
| VLDL             | 05 - 40 mgs/dl         |

RESULTS
The data were intended in Ms Excel and we find out the mean and SD of lipid profile in PIH patients and we show that:

Table 3: Mean and SD of lipid profile in PIH patients

| Parameters (mg/dl) | Mean ± SD       |
|--------------------|-----------------|
| Mean HDL level     | 47.6 ± 16.6     |
| Mean TG            | 293.46 ± 143.96 |
| Mean LDL           | 151.06 ± 72.71  |
| Mean VLDL          | 53.83 ± 26.15   |

Table 4: Comparison of Blood Lipids in PIH Patients with Their Standard Values.

| Parameters (mg/dl) | Normal Value (mg/dl) | Number of Patients | Percentage of Patients (%) | Mean +/- SD       |
|--------------------|----------------------|--------------------|----------------------------|-------------------|
| Triglycerides      | 40-150               | Low-0              | Low-0                      | 293.46 ±143.96    |
| HDL Cholesterol    | 35-75                | Low-8              | Low-13.3                   | 47.6 ± 16.66      |
| VLDL Cholesterol   | 2-30                 | Low-0              | Low-0                      | 53.83 ± 26.15     |
| LDL Cholesterol    | 80-175               | Low-8              | Low-13.3                   | 151.06 ± 72.71    |

*standard values in normal females, reference- Biochemistry Lab of JMC/ Reg. No. 318/JPR/2007-08

DISCUSSION

- In this study we investigate the role of lipid profile in PIH patients.
- Based on the reports of our PIH patients from the Biochemistry lab of Jhalawar medical college we found that:
  - TG was increase in 86.6% of PIH patients. HDL was normal in 80% and decreased in 13.3%
  - LDL was increased in 33.3% and normal in 53.3%
  - VLDL was increased in 86.6% in PIH patients.
  - TG: HDL ratio increased significantly in PIH patients Thus assessment of blood lipids may be helpful in prevention of complication in PIH. The principle modulator of hypertriglyceridemia is oestrogen as pregnancy
associated with hyperestrogenemia, oestrogen induced hepatic biosynthesis of endogenous triglyceride which is carried out by VLDL\textsuperscript{10}.

Increased TG found in PIH is likely to be deposited in predisposed vessels such as uterine spiral arteries and contributes to the endothelial dysfunctions and both directly and indirectly through generation of small dense LDL\textsuperscript{11}. This hypertriglyceridemia may be associated with hypercoagulability\textsuperscript{12}.

In present study, no significant alteration in total cholesterol level could be observed and third trimester of normal pregnancy in any of the groups. These findings are similar to Satter et al\textsuperscript{13}. However, others have found significant increase in serum total cholesterol in toxaemia of pregnancy\textsuperscript{13,14}.

In our study, significant decreases in HDL were observed in severe PIH (PE & E) pregnant women. Estrogen is responsible for induction of TG and HDL and suppression of serum LDL and estrogen level falls in severe PIH (Pre-Eclampsia).\textsuperscript{15} The low level of HDL in pre-eclampsia is however not only because of hypoestrogenemia but also due to insulin resistance\textsuperscript{16}.

Findings reported in this study suggest that the women who develop pre-eclampsia and eclampsia have disturbed lipid profile due to abnormal lipid metabolism, increased TG level and delayed TG clearance and high blood pressure are reason for the development of the pre-eclampsia and eclampsia. So the need of lipid profile in early PIH patients may help in developing strategies for prevention and early diagnosis of pre-eclampsia and eclampsia.

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