

MEAN SERUM LIPID LEVELS AMONG PATIENTS WITH MILD VERSUS SEVERE ECLAMPSIA^[1]_[SEP]

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ABSTRACT

Background: Pre-eclampsia (PE) is a condition of high blood pressure in pregnancy and also having protein in urine. Preeclampsia is known to be a common disorder with vascular endothelial level malfunction , along with vasospasm which occurs after , twenty weeks of pregnancy, but it can also occur , as late as 4 to 6 weeks postpartum. There is a controversy in serum lipids levels among patients with mild or severe preeclampsia however, abnormality in lipid profiles exists in patients with preeclampsia. So we have conducted this study, to find out the serum lipid profile of patients with PE.

Objective: To compare the mean serum lipid levels, among the patients with mild versus severe pre-eclampsia (PE).

Material & Methods: This is a descriptive case series study. It was carried out at Obs and Gynae Dept of Lahore General Hospital for six months. 320 pregnant females with PE were selected by non-probability, purposive sampling type technique. The patients were then categorized out into the mild or severe types of pre-eclampsia. The Fasting venous blood sample of 5cc was taken in a disposable sterilized syringe and we sent to the laboratory of Lahore General Hospital, Lahore. The laboratory reports of serum lipid profiles were compared for any differences present between the 2(mild and severe). Student t-test was used for comparing the mean of serum lipid levels between the two categories of preeclampsia (mild or severe) . P-value less than 0.05 was to be taken as a significant value.

Results: In our study the patient's mean age was 24.79±3.89-year, mean BMI of the patients was 25.23±3.89 kg/m², obesity was observed in 30.63% patients. Mild preeclampsia was observed in 83.1% patients and severe preeclampsia was observed in 16.9% patients. Statistically highly significant differences were seen between the mean TC, TG and HDL levels with the severity of PE.

Conclusion: Our study results lead us to the conclusion that the patients with mild pre-Eclampsia had lower levels of LDL, TG, and TC compared with severe PE patients, while HDL value was found higher in females with mild PE as compared with severe PE.

Keywords: Severe Preeclampsia, Serum Lipid, Mild Preeclampsia, Cholesterol, High Blood Pressure

INTRODUCTION

We define Pre-eclampsia as a Blood Pressure record of 140/90 mm of Mercury. Or as an increase in systolic Blood Pressure of greater than 30 mmHg or a rise in diastolic blood pressure of more than 15 mmHg in a pregnancy of more than 20 weeks of pregnancy , having proteinuria which is either greater than or equal to +1^{1,2}. Preeclampsia is one of the commonest complication of a pregnancy that affects 5-8% women, increasing fetomaternal morbidity & mortality^{2,3}. According to severity, preeclampsia can be divided into two categories: mild preeclampsia (Blood Pressure of at least 140/90 mm of Hg; seen in 15% of all pregnancies)

or severe preeclampsia (BP at least 160/110 mmHg; seen in 8% of all pregnancies). Mild preeclampsia is seen to be occurring in about 15% of all pregnancies and severe type in about 8%⁴.

This disease may be characterized by red cell breakdown, platelet count having fall, disturbance of liver and kidney functions, edema, breathlessness due to presence of fluid in the lungs, and visual disturbances. Thus, the risk of poor outcome of the baby and mother is increased⁵. If condition is not treated, then it may end up in tonic seizures on which very critical point it is then known as eclampsia⁶. Preeclampsia's most prominent factor is high blood pressure which may be

due to vasospasm occurring in the kidneys, uterus, placenta and also the brain tissue. Another very important phenomenon which may be responsible for the Pathogenesis of Pregnancy induced Hypertension is the alteration in lipid synthesis which in turn leads to decrease in PGI₂:TXA₂⁷. This is often noted that abnormality in lipid profile exists in patients having preeclampsia. The patients with mild Pre-eclampsia had lower levels of Low-density Lipoproteins, Triglycerides, and Total Cholesterol compared with severe Pre-eclampsia patients, while High density Lipoproteins value was found higher in females with mild PE⁸.

The normal range of lipid profiles is; Cholesterol, 40 – 200 mg/d; Triglycerides, 50 – 175 mg/dl; LDL, 20 – 100 mg/dl; and HDL :> 40mg/dl).

Its risk factors include increased BMI, hypertension, increasing age, diabetes mellitus, first pregnancy and twins⁹. For prevention it is recommended to use aspirin in high risk patients. Calcium supplementation is also recommended in deficient areas, and control of chronic hypertension with medicine is also necessary¹⁰ An effective treatment of PE is delivering fetus and placenta. Timing of delivery depends on how severe the PE and the period of gestation. Antihypertensive e.g., methyl dopa and labetalol, may be necessary to control BP, and the critical state of mother before the delivery. Magnesium sulfate is used in preventing eclampsia fits in those patients with severe type of disease. Bed rest and restriction of salt have no role in either treatment or prevention of PE^{11,12}.

The knowledge of serum lipid profiles among patients with mild and severe preeclampsia may guide us in establishing the treatment strategies (like screening or addition of lipid lowering drugs) which can be helpful in lowering the morbidity or mortality among such patients.

MATERIAL AND METHOD

It was a Descriptive case series type study which was carried out for 6 months in the Dept of Obs & Gynea, Unit I, Lahore General Hospital Lahore. The sample size (with a 95% confidence interval and 3% margin of Error) was 320 patients with mild and severe preeclampsia. Patients were selected by Non-probability consecutive sampling. Primi-gravida with Singleton pregnancy (on ultrasound), of 18-32 years of age, with period of gestation of 28 to 38 weeks, diagnosed as preeclampsia according to operational definition were to be included and patients who were multi-gravida or

with pre-existing hypertension, Renal disease or Diabetes mellitus were to be excluded from this study.

After taking informed consent by the patient or relative, the patients fulfilling the inclusion criteria presenting in OPD and emergency department was enrolled in the study. Detailed history and the clinical examination were taken. The patients were then categorized into mild or severe preeclampsia (as per operational definition). The fasting venous blood sample of 5 cc was taken in a disposable sterilized syringe and was sent to the laboratory of Lahore General Hospital, Lahore. The serum lipid profile was evaluated by a consultant Hematologist. The laboratory reports of serum lipid profiles were compared for differences between the two (mild or severe).

Data was analyzed using version 10 of SPSS. Student's t-test is used in comparing the mean of serum lipid levels between the two categories of preeclampsia (mild or severe) taking P-value less than 0.05 as significant.

RESULTS

In our study total number of patients were 320. The patient's mean age was 24.79± 3.89 years with an age range of 18 & 32 years. This study showed that the mean BMI value of the patients was 25.23±3.89 SD kg/m² with minimum and maximum values of 19 & 34 kg/m². **Table # 1**

In this study the mean LDL (Low density lipoprotein) value of mild preeclampsia patients was 108.07±18.51 SD mg/dl and in severe preeclampsia patients it was 149.98±195.97 SD mg/dl. Statistically insignificant difference was seen in the 2 pre-eclampsia groups of the patients i.e., p=0.122. The mean triglyceride (TG) value of mild preeclampsia patients was 176.26±22.02 mg/dl and in severe preeclampsia patients it was 248.55±28.08 mg/dl. Statistically a highly significant difference was seen in the 2 groups of preeclampsia patients (p-value=0.000).

The mean total cholesterol (TC) value of mild preeclampsia patients was 210.78±26.53 mg/dl and in severe preeclampsia patients it was 276.46±19.77 mg/dl. Statistically there, highly Significant difference was seen between mean TC of two groups of preeclampsia patients i.e p-value=0.000. The study results showed that mean HDL values of mild preeclampsia pts was 52.78±14.22 mg/dl and in severe preeclampsia patients it was 36.72±7.92 mg/dl, showing a highly significant difference was seen between the mean HDL in both groups (p-value=0.000). (**Table#2**)

Table # 1: Descriptive Statistics of age (years) and BMI (Kg/m²)

	N	Mean	SD	Minimum	Maximum
AGE (yrs)	320	24.79	3.89	18.00	32.00
BMI (Kg/m ²)	320	25.23	3.89	19.00	34.00

Table # 2: Comparison of LDL, TG,TC and HDL level in both preeclamptic groups

	N	PRE-ECLAMPSIA		P-value
		MILD	SEVERE	
		266	54	
LDL(mg/dl)	Mean	108.07	149.98	0.122
	SD	18.51	195.97	
TG(mg/dl)	Mean	176.26	248.55	0.000
	SD	22.02	28.08	
TC(mg/dl)	Mean	210.78	276.46	0.000
	SD	26.53	19.77	
HDL(mg/dl)	Mean	52.78	36.72	0.000
	SD	14.22	7.92	

For LDL p-value=0.122 (Insignificant)

For TG, TC and LDL p-value=0.000 (Significant)

DISCUSSION

Pre-eclampsia is a pregnancy related condition, which involves many systems. It has an association with a high rate of maternal and fetal morbidity and even mortality¹³. Access to health facility is quite limited in the under developed or developing countries and here pre-eclampsia has become major a etiology behind the maternal morbidity and mortality. This occurs in approximately 5-7% of pregnancies¹⁴. It is noted that as compared to normal pregnancies, serum triglycerides of women with pre-eclampsia show marked increases^{1,15}. The hypertriglyceridemia in pregnant women of gestational age 28 - 32 weeks could predict condition of preeclampsia¹⁶.

According to our study results severe pre-Eclampsia was found in 16.88% patients and mild pre-Eclampsia was found in 83.13% patients. In our study the insignificant difference was found between the LDL values by comparison of the 2 groups of study i.e. p-value=0.122. While significantly high difference was observed between the TG, TC and HDL values of the patients of the 2 study groups. Some of the studies are discussed below showing results according to our study. A higher mean levels of lipids profiles (triglycerides, LDL, VLDL) were observed in patients with Severe Preeclampsia as compared to those with Mild Preeclampsia in 2 studies carried out by Karwan EC^{17,18}. Singh U et al showed in their study that the Cholesterol, Triglycerides and the VLDL were significantly high whereas the LDL level had not been found to be notably high in severe cases of pre-eclampsia as compared with mild pre-eclampsia . But

there was a Significant Inverse relationship of the HDL level with the severity of PE. ¹⁹. However, in study Punthumapol C, et al, the mean values of lipids profile were almost equal, with each other's in the two different groups (mild versus severe preeclampsia)²⁰.

This high level reports of triglycerides in pts of pre-eclampsia had also been seen in the studies by few other R esearchers in some other countries^{1,2,21}. However, according to the studies of Zinat B et al and Chanvitya P et al there was no significant difference in the serum triglycerides level between pre-eclamptic pts and non-pre-eclamptic pts ^{20,22}. In our study highly significant difference was found between the TC, TG and HDL values of the pts and study groups with BMI (<30 &>30) kg/m². Arash Rafeenia, et al in their study demonstrating a significant differences in the weight, BMI, and Blood Pressures ,when the healthy pregnant non pre-eclamptic and women having mild pre-eclampsia were compared with patients having severe preeclampsia ²³.Winkler K et al have reported that the Serum Cholesterol was significantly lower in PE. The BMI of Mild Preeclampsia was more than Severe Preeclampsia and the BMI of both were more than normal pregnancies significantly²⁴.

Iftikhar et al concluded in their study that in patients with pre-eclampsia serum leptin levels have strong association with Total Cholesterol, whereas, no association was found with any other of the variables to be significant. The total cholesterol also rises with the severity of Pre-eclampsia when Leptin level is high. Such changes might be resulting from Oxidative Stress and it contribute in the process of atherogenesis and pathogenesis of PE²⁵. Zinat et al have reported a

Significant difference in the levels of HDL only among the patients having PE^{22,26}. Some recent researchers reported that when maternal dyslipidemia occurs in early second trimester it is associated with an increased risk of developing the condition of Pre-eclampsia. So, when dyslipidemia is found in early second trimester, it strongly predicts chance of pre-eclampsia.^{27,28,29}

However, there is controversy in serum lipids levels among patients with mild or severe preeclampsia. Nyam et al result show that the level of high density Lipoprotein (HDL) was quite low in the Pre-eclamptic Group (0.79 + 0.30mmol/L) as compared , with the Control Group (1.74 + 0.45)³⁰.

CONCLUSION

Thus, an estimation of the mother's Lipid profile if done in early gestation may help us to recognize early patient at a risk of , developing hypertensive disorder of pregnancy before ,the onset of the clinical symptoms, and their complications for maternal and fetal benefit. The findings of this study support strong relation between dyslipidemia and development of preeclampsia.

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