



TO EVALUATE THE ROLE OF LIPID PROFILE IN PREDICTION OF PRE ECLAMPSIA

Obstetrics & Gynaecology

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ABSTRACT

Background

Preeclampsia, a potentially fatal pregnancy illness, complicates 2-8% of pregnancies and puts both the mother and the fetus in danger of dying. There is high risk of developing seizures (eclampsia), renal and hepatic failure, pulmonary edema, stroke..

Objective

1. To compare the lipid profile of pre-eclamptic and normotensive pregnant females.
2. To correlate the lipid profile findings with the severity of pre-eclamptic women
3. To study the maternal and perinatal outcomes and correlate with lipid profile level with pre-eclamptic women

Methodology

This prospective case series study was conducted in Department of Obstetrics and Gynaecology, Muzzafarnagar Medical College. The present observational study was conducted in 100 patients of preeclampsia who came to outdoor and indoor patients, Department of Obstetrics and gynaecology. The medical records of all women with Preeclampsia who delivered between April 2022 and April 2023. **Results** When mean total cholesterol, TGA and HDL levels were compared between groups A and B, statistically significant difference between the two groups, and also mean LDL levels. When the number of subjects with abnormal lipid profile was compared between group A and group B, statistically significant difference between group A and group B for placental abruption, IUGR, and HELLP ($p < 0.01$), neonatal outcomes. **Conclusion** This study found that serum TGA and TC levels were significantly higher in pregnant women with late-onset preeclampsia. Lipid profile could be a useful clinical tool.

KEYWORDS

TGA , LDL, VLDL, HDL, SBP, IUGR, HELP

INTRODUCTION

Preeclampsia, complicates 2-8% of pregnancies and puts both the mother and the fetus in danger of dying^{1,2}. It manifests after 20 weeks of pregnancy, (SBP > 140 mm Hg; DBP > 90 mm Hg) with proteinuria (300 mg/24 hours)³. Without therapy, the mother runs a high risk of developing seizures (eclampsia), renal and hepatic failure, pulmonary edema, stroke, and demise⁴. Preeclampsia is a major risk factor for cardiovascular disease in mother and the fetus later in life⁵ and contribute to fetal morbidity and mortality⁶.

Early-onset sickness has been associated with poor maternal/fetal abnormalities⁷⁻⁸. There are two additional potential subgroups: gestational hypertension and preeclampsia with fetal growth restriction as opposed⁹⁻¹⁰. Pre-eclampsia appears between 14 and 20 weeks. It is increased in women with a family history of essential hypertension, and metabolic syndrome as well.

Patients with a history (GDM) during pregnancy are more likely to go on to develop Type 2 diabetes or (CVD). Maternal endothelium dysfunction is distinguishing characteristic. Some endothelial dysfunction markers, such as an imbalance of anticoagulation and pro-coagulation factors. Two important pathways in the proposed pathophysiology of preeclampsia, endothelial dysfunction, and oxidative stress.

MATERIALS AND METHOD

This prospective case series study was conducted in the Department of Obstetrics and Gynaecology, Muzzafarnagar Medical College. The present observational study was conducted in 100 patients of preeclampsia who came to outdoor and indoor patients, Department of Obstetrics and Gynaecology.

The medical records of all women with Preeclampsia who delivered between April 2022 and April 2023.

Inclusion Criteria

includes age between 18-36 years, randomly selected all pre-eclamptic Pregnant women beyond 20 weeks of gestation but not in labor, with gestational hypertension (Blood pressure $\geq 140/90$ mm Hg) or preeclampsia (blood pressure $\geq 140/90$ mm Hg and proteinuria ≥ 300

mg/dl over 24 hours) and patients with age, BMI, parity matched in healthy pregnant women beyond 20 weeks of gestation and not in labour.

Inclusion criteria of Normotensive Female

includes randomly selected pregnant women with normal healthy female more than 20wk without any complication

Exclusion Criteria

includes Chronic hypertension, molar Pregnancy, grade 3 and grade 4 Heart disease, Any other medical illness, Diabetes mellitus, Renal disorders, Cushing's syndrome, Obesity, anti epileptics, alcohol intake

Test Principles Of Lipids

Principles

1.Total Cholesterol

Rule is to free cholesterol whereas the second rule applies to total cholesterol.

Liebermann –Burchardt reaction in which bluish green solution produced that is Cholesterol oxidase method

1. LDL-

Fridewald equation is there to estimate VLDL cholesterol, TAG/5 is estimate of VLDL and is based on the average ratio of triglyceride/cholesterol

2. HDL-

Rocheboehringer-mannheim main reagent, made use of polyethylene glycol-coupled cholesteryl esterase and cholesterol oxidase used

3.VLDL-

Direct methods on selective precipitation uses polyvinyl sulfate and pretreatment with polyclonal antibodies to apo A1 and apo E and remove LDL,IDL,VLDL

4.Triglycerides -

Van Handel and Zilver Smith method and GC-MS method Lipid profile interpretation as per The National Cholesterol Education Program

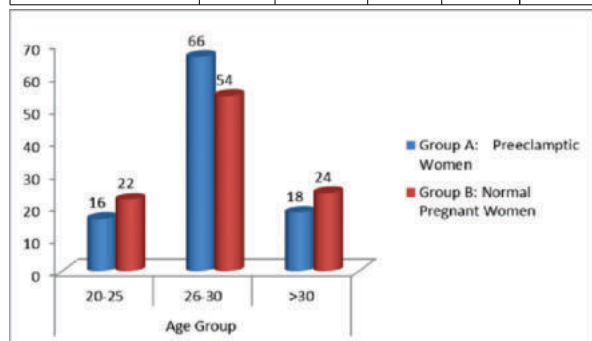
Data was collected and subjected to statistical analysis using SPSS version

Total Cholesterol	Desirable : <200 Borderline high- 200-239 High: > or =240
Triglycerides	Normal: <150 Borderline high: 150-199 High: 200-499 Very high: > or =500
HDL Cholesterol	Low(removed HDL): <40 Normal: 40-60 High: >60
LDL Cholesterol	Optimal: <100 Near Optimal: 100-129 Borderline high: 130-159 High: 160-189 Very high: > or = 190

RESULTS

Table 1: Age distribution among the study groups (N=100)

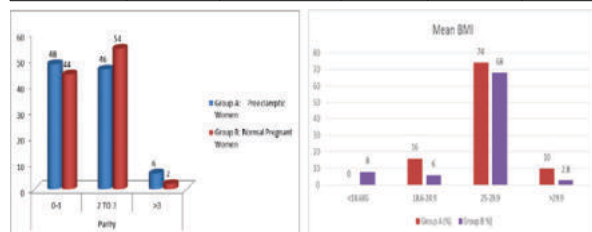
Age Group (in years)	Group A: Preeclamptic Women		Group B: Normal Pregnant Women		p value
	N	%	N	%	
20-25	8	16	11	22	0.47
26-30	33	66	27	54	
>30	9	18	12	24	
Total	50	100	50	100	



Graph 1: Age distribution among the study groups

Table 2: Parity among the study subjects (N = 100)

Parity	Group A: Preeclamptic Women		Group B: Normal Pregnant Women		p value
	N	%	N	%	
0-1	24	48	22	44	0.49
2-3	23	46	27	54	
>3	3	6	1	2	
Total	50	100	50	100	



Graph 2: Parity among the study groups

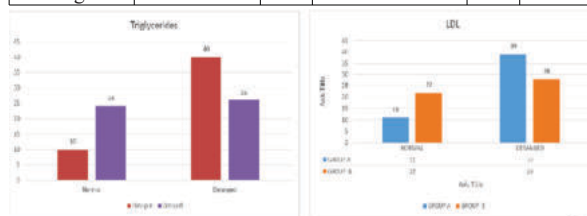
Table 3: Mean BMI among the study groups (N = 100)

BMI (kg/m ²)	Group A: Preeclamptic Women		Group B: Normal Pregnant Women		P value
	N	%	N	%	
<18.6	0	0	4	8	0.095
18.6-24.9	8	16	3	6	

25-29.9	37	74	34	68	
>29.9	5	10	9	18	
Mean±SD	16.66 ± 14.42		12.5±17.67		

Table 4: Lipid profile among the study groups (N = 100)

Triglycerides	Group A: Pre eclamptic Women	%	Group B: Normal Pregnant Women	%	P value
NORMAL (<150mg/dl)	10	20%	24	48%	0.0031*
Deranged (>150mg/dl)	40	80%	26	52%	



p value = <0.01 * significant **: highly significant

(B) LDL profile

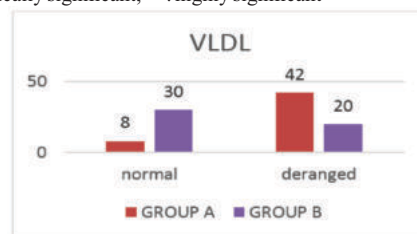
LDL	Group A: Preeclamptic Women	%	Group B: Normal Pregnant Women	%	P value
NORMAL (100-129)	11	22%	22	44%	0.019*
DERANGED (130-159)	39	78%	28	56%	

*: statistically significant, **: highly significant

(C) VLDL lipid profile (N = 100)

VLDL	Group A: Preeclamptic Women	%	Group B: Normal Pregnant Women	%	P value
NORMAL (2-30mg/dl)	8	16%	30	60%	<0.00001*
DERANGED (>30mg/dl)	42	84%	20	40%	

*: statistically significant, **: highly significant

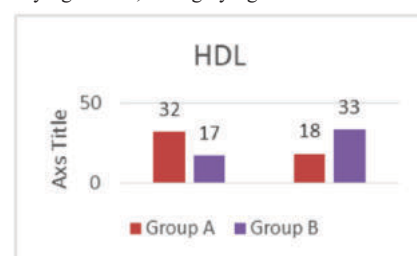


Graph 4 C: VLDL & HDL lipid profile

(D) HDL lipid profile (N = 100)

HDL	Group A: Preeclamptic Women	%	Group B: Normal Pregnant Women	%	P value
Normal	32	64	17	34%	<0.002
Deranged	18	36	33	66%	

*: statistically significant, **: highly significant

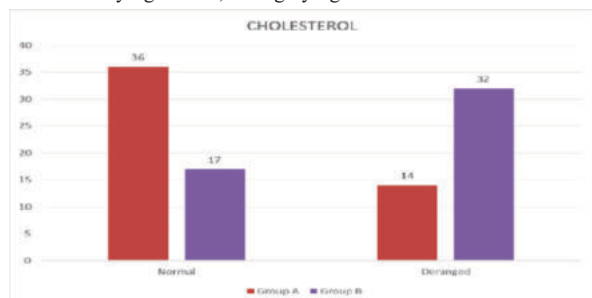


Graph 4D: HDL lipid profile

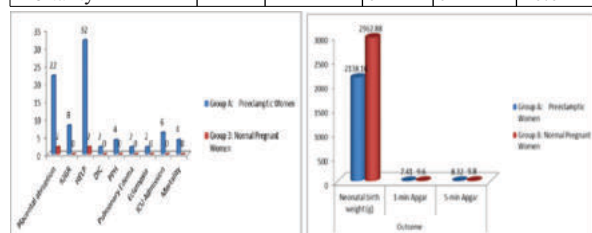
(e) Total Cholesterol (n = 100)

Total cholesterol	Group A: Preeclamptic Women	%	Group B: Normal Pregnant Women	%	P value
Normal(<200mg/dl)	36	72%	17	34%	<0.00304*
Deranged(>200 mg/dl)	14	28%	32	64%	

*: statistically significant, **: highly significant

**Graph 4E: Total cholesterol****Table 5 Maternal complications among the study groups(N = 100)**

Complications*	Group A: Preeclamptic Women		Group B: Normal Pregnant Women		P value
	N	%	N	%	
Placental abruption	11	22	1	2	<0.01*
IUGR	4	8	0	0	<0.01*
HELP	16	32	1	2	0.71
DIC	1	2	0	0	0.47
PPH	2	4	0	0	0.71
Pulmonary Edema	1	2	0	0	0.71
Eclampsia	1	2	0	0	0.32
ICU Admission	3	6	0	0	0.47
Mortality	2	4	0	0	<0.01*

**Graph 6: Maternal complications****Table 7 Neonatal outcome among the study groups (N = 100)**

Outcome	Group A: Preeclamptic Women		Group B: Normal Pregnant Women		p value
	Mean	SD	Mean	SD	
Neonatal birth weight (g)	2138.16	296.45	2962.88	373.06	<0.01*
1-min Apgar	7.41	1.5	9.6	1.2	0.006*
5-min Apgar	8.32	1.3	9.8	1.6	0.009*

*: statistically significant

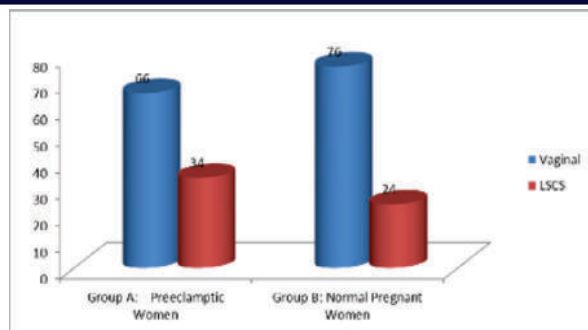
Table 8: Mode of delivery among the study groups (N = 100)

Mode	Group A: Preeclamptic Women		Group B: Normal Pregnant Women		P value
	N	%	N	%	
Vaginal	33	66	38	76	0.27
LSCS	17	34	12	24	

*: statistically significant

DISCUSSION

Preeclampsia is a disorder that only occurs during pregnancy and characterized by proteinuria and hypertension. It is caused by vasospastic phenomena in the kidney, uterus, placenta, and brain. The following were the study's primary conclusions:

**Distribution By Age**

Participants (n=33, 66%) in group A (Pre Eclamptic Women) the ages of 26 and 30, while 9 subjects (18%) were older than 30 and 8 subjects (16%) the ages of 20 and 25. Maximum subjects in group B (control group/normal pregnant women/normoglycemic pregnant women) aged 26 to 30 years (n=27, 54%), followed by 24% of subjects over 30 years of age and there was no statistically significant difference. The results of this study are consistent with those of Usharani N (2022)¹¹, and Joy SB et al., (2019),¹² no significant difference between A & B

Obstetrical Distributions

In our investigation, parity and gestational age showed no significant difference between group A and group B similar to Joy SB et al.¹² 2019, Rauf Melekolu et al. 2022¹³ studies, Abdel Azim Ahmed et al.¹⁴

Bmi –

In our study, group A's mean BMI was 16.6 1.52, while group B's mean BMI was 12.5 1.68. According to BMI and Mean BMI, no statistically significant difference between group A and B as like in Joy SB et al.¹⁵, (2019), and Shazia Parveen et al.¹⁵ (2022). According to study by Umme Salma et al. from 2022, 10% of pre-eclamptic women have higher BMIs than normotensive pregnant women.

Lipid Profile

Dr Nidhi, Dr Brinderjeet Kaur, Dr S Fayyaz,¹⁶ 2019 study found that there is deranged levels triglyceride, HDL, VLDL, LDL, Total cholesterol and it is statistically significant between two groups same as like in my study, deranged lipid profile in Pre eclamptic patients 80% triglycerides, 84% VLDL, 39% LDL, 36% HDL, 28% cholesterol.

In the Usharani N, Asharani KNM¹¹ study (2022), healthy controls had considerably higher mean blood levels of VLDL cholesterol, whereas subjects with pre-eclampsia had significantly lower mean serum levels of HDL cholesterol (p=0.05). A study by Sadiq Jan and Sobia Nawaz (2021) revealed that preeclampsia patients have higher VLDL and triglyceride levels

However, others have shown pre-eclamptic women have greater TGA levels than typical pregnant women, with the results of Nidhi D et al. (2019)¹⁶, and Abdel Azim Ahmed et al., (2018)¹⁴.

The preeclampsia group and the normotensive group had significantly difference in studies of Joy SB et al.¹², Nidhi D et al.¹⁶ and Abdel Azim Ahmed et al. (2018)¹⁴.

In Raghuram Pusukuru and Varshil Mehta (2017), a statistically significant association between serum triglyceride levels and preeclampsia.

Mother Difficulties

In my study group A who experienced placental abruption, 4 IUGR, 16 patients HELP, 3 ICU admission, 2 PPH and death, and 1 DIC, pulmonary edema, and eclampsia. One mother (2%) in group B experienced both HELP and placental abruption. When placental abruption, IUGR, and HELP occurred, there was a statistically significant difference between groups A and B.

The incidence of FGR and placental abruption was greater in the preeclampsia groups compared to the healthy group in Juan Li et al study.¹⁷

How It Is Delivered

In my investigation, group A 34% LSCS and 33 subjects (66% delivered vaginally). In group B, 12 individuals (or 24%) had LSCS,

whereas 76% of women gave birth vaginally. Mode of delivery in between groups A and B, there was no statistically significant difference same as like Rauf Melekolu1 and Seyma Yaşar 2022¹³ in groups A and B (77 and 83.3% respectively)

Neonate And Complications

Group A has mean newborn birth weight of 2138.16296.45 g and a mean 1-min. The mean 5-min Apgar was 8.321.3, and the Apgar was 7.411.5. In group B, the average newborn weight was 2962.88 g, the average 1-min Apgar was 9.6 g, and the average 5-min Apgar was 1.2, The APGAR was 9.81.6. Neonatal outcomes Groups A and B differed statistically significant. As like as in this study Dr. Suman Dath.S*¹⁸ 2021 study mean Apgar score of group B 7.41±0.7 (1 minute) and 8.81±0.65 (5 minutes). Rauf Melekolu1 and Seyma Yaşar 2022¹³, there is no discernible difference.

CONCLUSION

In all the subjects, concentrations of serum triglycerides, serum total cholesterol, serum LDL, serum VLDL and serum HDL cholesterol were estimated. The results showed that mean value of serum triglycerides, serum total cholesterol, serum LDL cholesterol and serum VLDL cholesterol concentration were significantly increased in women with pre-eclampsia as compared with healthy pregnant women. This study reveals the role of dyslipidemia in elucidating the pathophysiology of complications associated with preeclampsia

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