



ESTIMATION OF SERUM LIPID PROFILE & RELATION OF BLOOD PRESSURE WITH SERUM LIPID PROFILE IN HYPERTENSIVE PRIMIGRAVIDA PATIENTS- A CROSS SECTIONAL STUDY.

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ABSTRACT

Background: Hypertension during pregnancy is an important cause for maternal morbidity and mortality. During pregnancy, there is an alteration in serum concentration of fatty acids, triglycerides, cholesterol & phospholipids as there is a change in lipoprotein metabolism in the liver & adipose tissue, associated with an increase in estrogen levels & chances are more in Pregnancy induced Hypertension which may result in high blood pressure and proteinuria. **Objectives:** To estimate serum lipid profile & to determine the relation of blood pressure with serum lipid profile in Hypertensive Primigravida patients. **Materials & Methods:** A hospital based cross-sectional observational study was performed among 164 hypertensive primigravida patients between 28-34 weeks of Gestational age. 4 subjects were recruited on the first working day of every week & General Physical Examination & Obstetric Examination were performed & Blood sample was sent for estimation of serum Lipid Profile. Analysis had been done by using chi-square test, Fisher's exact test & ANOVA test, Pearson correlation coefficient test. **Results:** 29% of the total study population belongs to Chronic hypertension (CH) group. Mean systolic blood pressure being highest in Preeclampsia group (PE) is 173.22 ± 22.16 . In lipid profile, parameters like Total Cholesterol, Triglyceride, LDL, VLDL, the mean differences of these parameters between the 4 study groups are found to be statistically significant. Blood Pressure changes is found to be positively correlated with cholesterol, LDL, VLDL & Triglyceride changes but only cholesterol changes with SBP change is statistically significant. Eclampsia develops more among the mothers having Preeclamptic condition (39.3%) but there is no association between maternal outcome and different forms of hypertension during pregnancy. IUGR was comparatively higher among the mothers having Preeclampsia & Chronic HTN was more common among Preeclamptic mothers. **Conclusion:** Dyslipidemia associated endothelial dysfunction causes Hypertension & Proteinuria, which are the clinical hallmark of Severe Hypertensive Disorders of Pregnancy. Early diagnosis can help the obstetricians to prepare themselves to combat the adverse conditions with positive fetal-maternal outcome.

KEYWORDS : Serum Lipid Profile, Blood Pressure, Hypertensive Primigravida.

INTRODUCTION

Hypertension during pregnancy is an important cause for maternal morbidity and mortality. Among hypertensive disorders of pregnancy pre-eclampsia is the leading cause. Quantification of proteinuria in the pregnancy is important not only for making diagnosis, but also for predicting maternal and fetal outcome. During pregnancy, there is an alteration in serum concentration of fatty acids, triglycerides, cholesterol & phospholipids as there is a change in lipoprotein metabolism in the liver & adipose tissue, associated with an increase in estrogen levels. Lipoproteins levels increase more in Pregnancy induced Hypertension than in normal pregnancy and cause damage to endothelium that may result in high blood pressure and proteinuria. Different parameters in lipid profiles along with these changes in different types of hypertension in pregnancy help the obstetrician in quick decision making and management planning to prevent adverse maternal & fetal outcome.

Aim :-

- To assess the level of Serum Lipid Profile in Hypertensive Primigravida attending OPD in a tertiary care hospital

Primary Objectives :-

- To estimate serum lipid profile in hypertensive Primigravida.
- To determine the relation of blood pressure with serum lipid profile in Hypertensive Primigravida.

Secondary Objective :-

- To Follow up Pregnant women having abnormal lipid profile for fetal-maternal outcome.

MATERIALS & METHODS

- Study Design:** Cross-sectional Study.

- Study Type:** A hospital based Observational study.
- Study Period:** January 2023 to June 2024.
- Place of Study:** Department of Biochemistry in collaboration with the Department of Obstetrics & Gynaecology, AGMC & GBP Hospital.
- Study Population:** Hypertensive pregnant women attending the Department of Obstetrics and Gynaecology, AGMC & GBP Hospital, between 28 to 34 weeks of gestation.
- Sample Size:** 164 subjects

Inclusion Criteria:

- Primigravida, 18-35 years of age, diagnosed as hypertensive (Preeclampsia, Gestational hypertension, Chronic hypertension, and Preeclampsia superimposed on chronic hypertension).
- Primigravida with a live, singleton pregnancy with in third trimester (28 - 34 weeks).
- Willing to participate in the study.

Exclusion Criteria:

Patient were excluded if they had one or more of the following diseases :

- Diabetes Mellitus, thyroid disorder, Kidney disease or any other major systemic illness, with obstetric emergencies.
- Patients unwilling to participate in the study

Types of Hypertension in pregnancy	Definition
Chronic Hypertension (CH)	Chronic hypertension is high blood pressure that either precedes pregnancy, is diagnosed within the first 20 weeks of pregnancy, or does not resolve by the 12-week postpartum checkup

Gestational hypertension (GH)	Gestational hypertension, formerly known as pregnancy-induced hypertension or PIH, is the new onset of hypertension after 20 weeks of gestation (No protein in the urine, No manifestations of preeclampsia or eclampsia)
Preeclampsia (PE)	Preeclampsia is a multi organ disease process of unknown etiology characterized by the development of hypertension and proteinuria after 20 weeks of gestation.
Preeclampsia superimposed on chronic hypertension (PESCH)	New onset of proteinuria $\geq 300\text{mg}/24\text{ hrs}$ in hypertensive women but no proteinuria before 20 wks of gestation or a sudden increase in proteinuria or blood pressure or platelet count $< 11/\text{cumm}$ in women with hypertension & proteinuria before 20 weeks of gestation.

RESULTS

- 29% of the total study population belongs to Chronic hypertension (CH) group, followed by 28% belonging to Preeclampsia group (PE).
- Mean systolic blood pressure being highest in Preeclampsia group (PE) is 173.22 ± 22.16 .
- In lipid profile, parameters like Total Cholesterol, Triglyceride, LDL, VLDL, the mean differences of these parameters between the 4 study groups are found to be statistically significant.
- Blood Pressure changes is found to be positively correlated with cholesterol, LDL, VLDL & Triglyceride changes but only cholesterol changes with SBP change is statistically significant.
- Eclampsia develops more among the mothers having Preeclamptic condition (39.3%) but there is no association between maternal outcome and different forms of hypertension during pregnancy.
- IUGR was comparatively higher among the mothers having Preeclampsia & Chronic HTN was more common among Preeclamptic mothers

Table 1 : Comparison of Lipid Profile Between the Study Group (N= 164)

	Group CH Mean $\pm$ SD	Group-GH Mean $\pm$ SD	Group-PE Mean $\pm$ SD	GROUP-PESCH Mean $\pm$ SD	P value (ANOVA)
Total Cholesterol	181.35 $\pm$ 51.63	205.51 $\pm$ 54.98	250.33 $\pm$ 81.45	259.55 $\pm$ 83.67	0.001
Triglyceride	144.78 $\pm$ 31.98	162.85 $\pm$ 43.84	181.71 $\pm$ 48.02	185.85 $\pm$ 41.68	0.001
HDL	58.89 $\pm$ 11.19	63.03 $\pm$ 13.49	55.88 $\pm$ 13.68	51.15 $\pm$ 9.91	0.63
LDL	96.57 $\pm$ 47.38	107.70 $\pm$ 49.42	123.29 $\pm$ 75.79	171.21 $\pm$ 75.07	0.001
VLDL	28.95 $\pm$ 6.38	32.56 $\pm$ 8.64	36.34 $\pm$ 9.60	37.16 $\pm$ 8.33	0.001

Table 2: Correlation Between SBP & Total Cholesterol (N= 164)

Correlation		SBP	CHLOESTEROL
SBP	Correlation Coefficient	1.000	0.156
	Sig. (2-tailed)	0.0	0.046
	N	165	164
CHLOESTEROL	Correlation Coefficient	0.156	1.000
	Sig. (2-tailed)	0.046	0.0
	N	164	164

Table 3: Correlation Between DBP and TG Level (N= 164)

Correlation		DBP	TRIGLYCERIDE
DBP	Pearson Correlation	1	0.086

TRIGLYCERIDE	Sig. (2-tailed)		0.276
	N	164	164
	Pearson Correlation	0.086	1
	Sig. (2-tailed)	0.276	
	N	164	164

DISCUSSION

- In this study majority of the patients who developed preeclampsia (PE & PESCH) are in the age group of 18-25 years followed by 26-30 years & the lowest belong to the age group of 31-35 years.
- Among Hypertensive primigravida, mean total cholesterol, Triglyceride, LDL & VLDL levels are found to be raised more in PE & PESCH study groups in comparison to CH & gestational hypertension groups, which is statistically significant between all the four groups, where as HDL is negatively correlated to PE & PESCH. A similar study conducted by Gawade S et al found that the mean total cholesterol, triglycerides & VLDL in preeclampsia was significantly higher than in normal pregnancy.
- In our study, we have found 28% pre-eclamptic mothers within 34th week of POG (Period of Gestation). But as per the study conducted by Wójtowicz A et al 106, 52.8% women developed preeclampsia within 34 weeks of POG.
- Altered lipid profile with increased Triglycerides and decreased HDL levels are evidenced in preeclamptic patients, so lipid profile is an important parameters as an early assessment tool in the prediction of preeclampsia.
- Blood Pressure changes are found to be positively correlated with cholesterol, LDL, VLDL, Triglyceride.
- Among all 4 study groups, caesarean delivery are seen more among preeclamptic mothers (35.3%). We found significant association between Mode of Delivery and different form of hypertension during pregnancy.

CONCLUSION

- Dyslipidemia associated endothelial dysfunction causes Hypertension & Proteinuria, which are the clinical hallmark of severe hypertensive disorders of Pregnancy.
- IUGR was comparatively higher among the mothers having Preeclampsia & Chronic HTN & PTB was more common among Preeclamptic mothers.
- This study helped us understanding the pathophysiology of severe Hypertensive Disorders of Pregnancy and their early diagnosis, which can help the obstetricians to prepare themselves to combat the adverse conditions with positive feto-maternal outcome.

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