Padma Leela *et al.* / *International Journal of Preclinical & Pharmaceutical Research.* 2012; 3(2): 114-117.

e-ISSN 2249-7552
Print ISSN 2229-7502

International Journal of
Preclinical & Pharmaceutical Research

Journal homepage: www.preclinicaljournal.com

STUDY OF SERUM LIPID PROFILE IN EARLY SECOND TRIMESTER AS PREDICTOR OF HYPERTENSIVE DISORDERS COMPLICATING PREGNANCY

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ABSTRACT

Hypertensive disorders complicate 5 to 10% of all pregnancies and together they form one member of the deadly triad along with hemorrhage and infection that contribute greatly to maternal and neonatal morbidity and mortality. The association of alteration of serum lipid profile in essential hypertension is well documented. The most important feature in preeclampsia is hypertension which is due to vasospastic phenomenon. Altered lipid synthesis leading to decrease in PG I 2 : TxA2 ratio is also supposed to be an important way of pathogenesis in gestational hypertension. Moreover, the hormonal imbalance is a prime factor for the etiopathogenesis of gestational hypertension and this endocrinological imbalance is well reflected in alteration of serum lipid profile. Therefore, simple measurement of serum lipid profile in second trimester may be of predictive value in preeclampsia. The study compromised of estimation of serum lipid profile in antenatal women in second trimester to test whether women with abnormal lipid profile subsequently develop hypertension with without proteinuria. All antenatal women between 14 and 20 weeks of gestation were selected irrespective of parity and serum lipid profile was estimated. The cases were followed up till delivery regarding development of hypertension with or without proteinuria. All the data was collected and results were analysed. Out of 112 cases, 9 cases developed hypertension with or without proteinuria and 103 cases had normal blood pressure. Out of 9 cases, 3 women had only gestational hypertension and 6 women had developed preeclampsia. The total cholesterol, triglycerides, LDL, and VLDL levels increased significantly in women who developed hypertension with or without proteinuria subsequently. Out of 9 women who developed hypertension subsequently, 8 women had abnormal lipid profile. Maternal dyslipidemia done at second trimester appears to be a good non- invasive predictor of pregnancy induced gestational hypertension or preeclampsia.

Key words:- Preeclampsia, Vasospasm, Endothelial dysfunction, Hyperlipidemia.

INTRODUCTION

Hypertensive disorders of pregnancy including preeclampsia, complicate upto 10% of pregnancies worldwide, and constitute one of the greatest causes of maternal morbidity and mortality and perinatal morbidity and mortality. Hypertensive disorders of pregnancy are major contributors to prematurity. Preeclampsia either alone or superimposed on preexisting chronic hypertension presents the major risk.

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Preeclampsia is responsible for 50,000 to 60,000 preeclampsia – related deaths per year worldwide and is a risk factor for future cardiovascular disease and metabolic disease in women. Despite considerable research, the etiology of preeclampsia remains unclear. Identification of patients with severe forms of eclampsia continues to be a challenge to clinicians. Preeclampsia is a multi-systemic disease and placenta is evident as the root cause of preeclampsia. The insult to the placenta is proposed as an immunologically initiated alteration in trophoblast function, and the reduction in trophoblast invasion leads to failed vascular remodeling of the maternal spiral arteries that perfuse the placenta. The resulting reduced perfusion and increased velocity of blood perfusion the intervillous space alter placental function which leads to maternal

disease. A great deal of effort has been directed at identification of demographic factors, biochemical analytes, or biophysical findings, alone or in combination to predict pre eclampsia and no test is yet ready for clinical use. Maternal plasma lipids are significantly elevated during pregnancy. There are evidences that abnormal lipid profile in early pregnancy could be one of the factors for subsequent development of preeclampsia.

Objective of the study

To determine serum lipid profile early in second trimester of antenatal women and to study whether antenatal women with abnormal lipid profile in second trimester have the risk of developing gestational hypertension or preeclampsia and to determine whether dyslipidemia can be used as a marker in predicting PIH.

MATERIALS AND METHODS

All antenatal women between 14 to 20 weeks of gestation irrespective of parity who attended antenatal outpatient department and those admitted in Government Victoria Hospital were selected for the study from February 2011 to July 2012. Institutional Ethical committee permission was obtained. Serum lipid profile estimation was done for those women by auto analyzer after overnight fasting of 12 hours after informed consent from the patient. The cases were followed up regularly till delivery particularly regarding development of gestational hypertension or preeclampsia. All the data was collected and results were analyzed. All the patients in the study were subjected to detailed history regarding age, parity, socio – economic status, history of diabetes, hypertension, past obstetric history, past medical history, smoking habits; family history of diabetes, hypertension were noted. Systemic examination including blood pressure and estimation of gestational age were carried.

Inclusion Criteria

Those with known LMP or first trimester ultrasonography screening and gestational age between 14-20 weeks were selected irrespective of parity.

Exclusion Criteria

Women with hypertension diagnosed before 20 weeks of gestation, diabetes mellitus, multiple pregnancy were excluded.

RESULTS

In the present study, Lipid profile estimation was done in 112 patients, out of which 9 patients, developed hypertension with or without protienuria.

Table 1. Age wise distribution

In our study the age prevalence was as follows:-

Age	No. of patients	Percentage
15-20 years	39	34.8
21-25 years	57	50.9
26-30 years	12	10.7
31-35 years	3	2.7
> 35 years	1	0.9
Total	**112**	**100%**

Maximum subjects were in the 21-25 years age group.

Table 2. Parity wise distribution

In our study, the obstetric history of subjects was as follows.

		Percentage
Primigravida	56	50%
Gravida 2	41	36.6%
Gravida 3	9	8
Gravida 4	4	3.6%
Gravida 5 and more	2	1.8
Total		**100%**

Majority of the subjects that is 50% were primigravidae.

Table 3. Socio – Economic Status

		Percentage
Low Income group	77	69%
Middle Income group	35	31%
High Income group	---	---

In our study, the low socio economic group predominated.

Table 4. B M I

		Percentage
Low BM I	19	16.9
Average BMI	83	74.2
High BMI	1	8.9

In our study women with average BMI predominated.

Table 5. Status of Lipid Profile

Normal Lipid Profile	104	93%
Abnormal Lipid Profile	8	7%
Total	112	100%

Table 6. Status of hypertension

Out of 112 cases, 9 cases developed hypertension with or without proteinuria and 103 cases remained normotensive.

		%
Normotensive	103	92%
Gestational Hypertension (without proteinuria)	3	5.4%
Preeclampsia	6	2.6%
Total	112	100%

Out of 9 women 3 developed gestational hypertension without proteinuria and 6 cases had developed preeclampsia.

Table 7. In our study the average values of lipid profile were as follows:

Lipid Profile	Normotensive Pregnant women	Hypertensive women (with or without protein
Total cholesterol (mg / dl)	170.1 ± 15	290 ± 15
Triglycerides (mg / dl)	90 ± 15	230 ± 15
LDL – C (mg / dl)	85 ± 15	130 ± 10
HDL – C (mg / dl)	45 ± 10	40 ± 5
VLDL (mg / dl)	24 ± 5	35 ± 10

DISCUSSION

In our study, it was observed that 34.8% were between 15 to 20 years age group and maximum subjects were in the age group 20 to 25 years that is 50%. Majority of the subjects that is about 50% were primigravidae and about 69% belonged to low socio economic group. About 74.2% of the women had average BMI and 8.9% had High BMI. It was observed 93% of women out of 112 subjects had normal lipid profile and 7% had abnormal lipid profile and 92% of the women had normal blood pressure till delivery and 5.4% developed gestational hypertension and 2.6% had preeclampsia in the third trimester [1-12].

It was observed that total cholesterol (TC), triglycerides, very low density lipoprotein (VLDL) values in pregnant women was higher than the corresponding TC, triglycerides and VLDL in non-pregnant women. The total cholesterol, very low density lipoprotein, LDL in gestational hypertension and preeclampsia were significantly higher than the corresponding values in normotensive pregnant women. The mean value of HDL in hypertensive group had fallen compared to the normotensive group.

In the present study, we observed an association between abnormal lipid profile in early pregnancy and subsequent risk of gestational hypertension or preeclampsia. Pregnant women who subsequently developed preeclampsia had increased total cholesterol, increased triglycerides, LDL – Cholesterol and VLDL – Cholesterol and decreased HDL – Cholesterol concentrations as compared to pregnant women who remained normotensive.

CONCLUSION

The present study showed that maternal dyslipidemia is a good non-invasive predictor of gestational hypertension or preeclampsia. Thus estimation of maternal lipid profile in early second trimester will bring about early recognition of patients at risk of hypertension before the actual manifestation and complications of hypertension appear for a better feto – maternal outcome.

ACKNOWLEDGEMENT

The authors wish to thank the departments of obst. & gyneacology and Biochemistry for extending their help in this study. We also wish to thank the participants of this study without whom this study would not have been

feasible. Authors acknowledge the immense help received from those scholars whose articles, journals and books are cited and included in references of this manuscript.

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