AN OBSERVATIONAL STUDY TO EVALUATE THE LEVEL OF SERUM LIPID PROFILE IN EARLY SECOND TRIMESTER (14-20 WEEKS) AS PREDICTOR OF SEVERITY OF HYPERTENTIVE DISORDER OF PREGNANCY

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ABSTRACT

Background: The study aimed to evaluate the level of serum lipid profile in early second trimester (14-20weeks) and to investigate the relationship of lipid profile with severity of hypertensive disorder of pregnancy.

Material & Methods: Serum Lipid profile (cholesterol, triglyceride, LDL, VLDL, HDL) was measured by spectrophotometric principle by enzymatic colorimetric test with lipid clearing factor (LCF) in 140 pregnant women between 13-20 weeks of gestation.

Results: Out of 140 cases, 12 cases developed gestational hypertension, 5 cases developed mild preeclampsia, 4 cases developed severe preeclampsia and 119 remains normotensive. The total cholesterol, triglyceride, LDL, and VLDL level were gradually increasing from normotensive to Gestational hypertension, to mild Preeclampsia and to severe preeclampsia while HDL level was decreasing.

Conclusion: So finally we conclude that the lipid profile can be considered as an early, economical and noninvasive procedure of assessment of severity of HDP cases.

Key-words: Hypertensive disorder of pregnancy, Cholesterol, Triglyceride, LDL, VLDL, HDL.

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INTRODUCTION

Hypertensive disorder of pregnancy is a multisystem disorder of unknown etiology characterized by hypertension with or without proteinuria developing after 20 weeks of gestation. It affects approximately 5-10% of all pregnancies, mostly primigravidas.[1] The most plausible theory of its central pathogenesis seems to involve the systemic activation and injury of maternal endothelial cells, which manifests as raised BP, proteinuria, systemic inflammatory response,

accumulation of anti-antigenic factors which seem to cause the disease by depriving the glomerular endothelial cells of essential growth factors.[2,3] Pregnancy termination reverses the clinical manifestation of the disease, suggesting that trophoblastic invasion has a central role in the pathogenesis of hypertensive disorder of pregnancy. A recent study revealed that excessive placental secretion of soluble fms like tyrosine kinase-1 may contribute to HDP.[4-8] Maternal plasma lipids are significantly elevated during pregnancy. There are also evidences suggesting that abnormal lipid metabolism in early pregnancy could be one of the factors for subsequent development of HDP.[9] During pregnancy, the increased level of estrogen causes increased hepatic biosynthesis of endogenous triglycerides through VLDL, this process is modulated by hyperinsulinism that starts in pregnancy and may result in endothelial cell damage in pregnancy. Altered lipid synthesis leading to decrease in PGI2 : TXA2 ratio is also supposed to be an important way of pathogenesis in hypertensive disorder of pregnancy. Thus abnormal lipid metabolism seems important in the pathogenesis of Hypertensive Disorder of pregnancy. Therefore, simple measurement of serum lipid parameters may be of good predictive value in toxaemia of pregnancy, avoiding the costly endocrinal investigations.[10]

AIMS AND OBJECTIVES

To study the level of serum lipid profile in early second trimester (14-20weeks) as a predictor of severity of hypertensive disorder of pregnancy.

MATERIAL & METHODS

This study was conducted on women attending antenatal clinic at early second trimester (14-20 weeks) in the department of Obstetrics & Gynaecology, SMS Medical College, Jaipur From March 2016 to December 2017**.** Approval from research review committee and ethical board was taken.Written informed consent was taken. All patients were evaluated by detailed clinical, obstetric, menstrual, past, personal and family history. Gestational age was calculated by LMP & USG. All patients were investigated to routine antenatal investigations Blood pressure was measured by auscultatory method. All patients were investigated for serum lipid profile. Venous blood (3 ml) was collected and tests were carried on the same day. Lipid profile (cholesterol, triglyceride, LDL, VLDL, HDL) was measured by spectrophotometric principle by enzymatic colorimetric test with lipid clearing factor (LCF). The demographic details were noted. All Patients were regularly followed till delivery Patients were considered hypertensive if the systolic pressure was 140 mmHg or more, and /or diastolic pressure of 90mmHg or more, measured on two occasions at least 4 hours apart. They were further divided into Normotensive, Gestational Hypertension, Preeclampsia without severe features and preeclampsia with severe features.

INCLUSION CRITERIA: All women with singleton pregnancy, attending ANC at early second trimester (14-20 weeks of gestational age) who were willing to participate in the study.

EXCLUSION CRITERIA: Women with hypertension diagnosed before 20 weeks of gestation, Diabetes mellitus, Multiple

pregnancies, Intrauterine fetal death, Other medical disorders – Thyroid disorder, renal disorder, heart diseases and liver disorder, Chronic smokers and alcoholics.

RESULTS:

Out of 170 women, 30 women were lost to follow up. So data were analyzed from 140 women who completed the study.Out of 140 cases, 119 (85%) were remains normotensive and 21(15%) cases were developed hypertensive disorder.

Table no. 1 Distribution of study population with presence of HDP

Status	No.	%
Normotensive	119	85.00
Gestational-Hypertension	12	8.57
Mild Preeclampsia	5	3.57
Severe preeclampsia	4	2.86
Total	**140**	**100**

Table no 2 Relation of lipid profile with severity of hypertension

Lipid Profile	Normotensive (n-119)	GH (n-12)	Mild PE (n-5)	Severe PE (n-4)	P value
Cholesterol mean±SD	172.9 ±19.8	*201.9 ±12.4*	*224.2 ±12.4*	*243.7 ±9.5*	*.000 S*
Triglyceride mean±SD	136.2 ±28.9	*159.0 ±22.7*	*180.71 ±13.00*	*201.5 ±2.12*	*.000 S*
(LDL mean±SD	*128.6 ±23.3*	*160.1 ±11.8*	*169.8 ±10.31*	*175.5 .±9.19*	*.000 S*
VLDL mean±SD	*31.00 ±4.19*	*32.25 ±5.80*	*35.6 ±2.19*	*42.00 ±4.8*	*.039 S*
HDL mean±SD	*41.71 ±9.32*	*38.50 ±9.37*	*38.10 ±9.16*	*34.75 ±5.7*	*.348 NS*

The above table shows that the mean levels of cholesterol, triglyceride, LDL and VLDL was gradually increasing from Gestational hypertension to mild Preeclampsia to severe preeclampsia while HDL level was decreasing.

DISCUSSION

In our study, it was observed that the maximum number of subjects, i.e. 88 (62.86%) belonged to age group 21-25 years. The mean age of the study population was 23.89±3. Maximum subjects that were 72 (51.43%) were primigravida, 13 cases out of 21 with HDP were primigravida.The majority of the study population was from the urban area (60%). In our study it was found that the cholesterol level ≤ 200 mg/dl was seen in 106 (75.71%) cases and cholesterol more than 200mg/dl was seen in 34 (24.29%) cases. Out of 106 cases of cholesterol level ≤ 200 mg/dl 100 (94.34%) remains normotensive and only 6 (5.66%) developed HDP, whereas out of 34 cases of cholesterol level more than 200mg/dl, 19 (55.88%) remains normotensive and 15 (44.12%) developed HDP.

Out of 15 cases of HDP with cholesterol level more than 200 mg/dl, 7 (46.67%) cases developed gestational hypertension, 4 (26.27%) cases developed mild preeclampsia and 4(26.27%) cases developed severe preeclampsia. Out of 6 cases with cholesterol ≤ 200mg/dl, 5(83.33%) cases developed gestational hypertension and only 1(16.67%) developed mild preeclampsia. The triglyceride level ≤ 165mg/dl was seen in 97 (69.29%) cases and triglyceride more than 165mg/dl was seen in 43 (30.71%)cases . Out of 97 cases of triglyceride level ≤ 200 mg/dl 89(91.75%) remains normotensive and only 8(8.25%) developed HDP. whereas out of 43 cases

of triglyceride level more than 200mg/dl, 30(69.77%) remains normotensive and 13(30.23%)developed HDP. Out of 13 cases of HDP with triglyceride level more than 165 mg/dl 3(23.07%) cases developed severe preeclampsia, 3(23.07%) cases developed mild preeclampsia and 7(53.86%) cases developed gestational hypertension. Out of 8 cases with triglyceride ≤ 165mg/dl 5(62.50%) cases developed gestational hypertension, 2(25%) cases developed mild preeclampsia and 1(12.5%) developed severe preeclampsia.

The LDL level ≤ 155mg/dl was seen in 104 (74.29%) cases and LDL level more than 155mg/dl was seen in 36 (25.71%)cases . Out of 104 cases of LDL level ≤ 155mg/dl 99(95.19%) remains normotensive and only 5(4.81%) developed HDP. Whereas out of 36 cases of LDL level more than 155mg/dl, 20(55.56%) remains normotensive and 16(44.44%)developed HDP. Out of 16 cases of HDP with LDL- cholesterol level more than 155mg/dl, 4(6.25%) cases developed severe preeclampsia, 4(43.75%) cases developed mild preeclampsia and 8(50.00%) cases developed gestational hypertension. Out of 5 cases with LDL-cholesterol ≤ 155mg/dl 4(80%) cases developed gestational hypertension, 1(20%)developed mild preeclampsia.

The VLDL level ≤ 35mg/dl was seen in 106 (75.71%) cases and VLDL more than 35mg/dl was seen in 34(24.29%)cases . Out of 106 cases of VLDL level ≤ 35mg/dl 98 (92.45%) remains normotensive and only 8 (7.55%) developed HDP. whereas out of 34 cases of VLDL level more than 35mg/dl, 21 (61.76%) remains normotensive and 13(38.24%)developed HDP. Out of 13 cases of HDP with VLDL-cholesterol level more than 35 mg/dl 4(30.8%) cases developed severe preeclampsia, 4(30.8%) developed mild preeclampsia and 5(38.46%) cases developed gestational hypertension. Out of 8 cases with VLDL-cholesterol ≤ 35mg/dl 7(87.50%) cases developed gestational hypertension, 1(12.50%) developed mild preeclampsia. The HDL level more than 40mg/dl was seen in 80 (57.14%) cases and HDL ≤ 40mg/dl was seen in 60 (42.86%)cases . Out of 80 cases of HDL level >40mg/dl 71(88.75%) remains normotensive and only 9(11.25%) developed HDP. whereas out of 60 cases of HDL level ≤ 40mg/dl, 48(80%) remains normotensive and 12(20%)developed HDP. Out of 12 cases with HDL cholesterol level≤ 40 mg/dl 3(08.34%) case developed severe preeclampsia and 2(33.33%) developed mild preeclampsia and 7(58.33%) developed gestational hypertension. Out of 9 cases with HDL- cholesterol more than 40mg/dl, 5(55.56%) cases developed gestational hypertension, 3(44.44%) developed mild preeclampsia and 1(%)developed severe preeclampsia. Similar results were seen in another study, done by Singh Urmila,Yadav S, Mehrotra S et al.,K Padma Leela, G. Rama Devi et al[12] and Yadav Kiran, Aggarwal Shalini et[13] al 2011 conducted study on Serum Lipid Profile in Early Second Trimester as Predictors of Pregnancy-Induced Hypertension.

CONCLUSION

The present study shows that the total cholesterol, triglyceride, VLDL and LDL

were increased and HDL was decreased in hypertensive disorder of pregnancy with severity of HDP, as compared to normotensive pregnant women. So finally we conclude that the lipid profile can be considered as an early, economical and noninvasive procedure of assessment of severity of HDP cases.

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