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ANALYSIS OF LEVEL OF MATERNAL SERUM TRIGLYCERIDES IN WOMEN WITH PRE-ECLAMPSIA

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Abstract:
Introduction: *Maternal metabolism in late pregnancy is catabolic, with increasing insulin resistance, decreased adipose tissue lipoprotein lipase (LPL) activity, and increased lipolysis.* ***Aims and objectives:*** *The main objective of the study is to analyse the level of maternal serum triglycerides in women with pre-eclampsia.* ***Material and methods:*** *This cross sectional study was conducted in Lahore general hospital, Lahore during October 2018 to January 2019. The data was collected from 120 female patients. The age range was 20 to 40 years. Eclampsia was diagnosed in previously normotensive women with two repeat (at least 4 h apart) diastolic blood pressure measurements of 90 mmHg or greater after the 20th week of gestation. A total volume of 5 ml of venous blood was drawn from the antecubital vein. The sera after separating from blood samples were stored at −80°C until further analysis. Serum triacylglycerol was estimated by the enzymatic colorimetric method (GPO-PAP), using kit method.* ***Results:*** *The data was collected from 120 pregnant females. The mean age was 25.67±3.45 years. Mean serum triglyceride concentartions in pre-eclamptic and controls normal pregnant women were 3.1 (0.8) mmol/l and 2.5 (0.9) mmol/l respectively. There was significantly high serum triglyceride concentration (P < 0.01) in the pre-eclamptic group than in the normal pregnant women. No significant differences were observed in other measured lipid profile including total cholesterol, HDL and LDL.* ***Conclusion:*** *It is concluded that total cholesterol, triglyceride, non-HDL-C, and HDL-C levels measured during pregnancy are significantly related to the risk of preeclampsia.*

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INTRODUCTION

Maternal metabolism in late pregnancy is catabolic, with increasing insulin resistance, decreased adipose tissue lipoprotein lipase (LPL) activity, and increased lipolysis. These processes combine to ensure the availability of maternal fuels such as glucose, fatty acids, and ketone bodies for fetal use [1]. It is recognized that gestational age, maternal obesity, and preeclampsia are associated with increases in lipids during pregnancy. Gestational diabetes mellitus (GDM) is also associated with abnormalities in maternal lipid metabolism, which may contribute to the elevated fat mass seen at birth in infants of women with GDM [2].

Preeclampsia is a potentially devastating disease of pregnancy that complicates 2%–8% of all pregnancies in the United States and can threaten the life of both the mother and her unborn child [3]. Manifesting after 20 weeks of gestation, preeclampsia is a multiorgan disorder defined as de novo hypertension (systolic blood pressure ≥140 mm Hg; diastolic blood pressure ≥90 mm Hg) combined with proteinuria (≥300 mg/24 hours), as defined by the American Congress of Obstetricians and Gynecologists [4]. Without intervention, the mother is at substantial risk for seizures (eclampsia), renal and liver failure, pulmonary edema, stroke, and death. For the fetus, preeclampsia poses increased risks of intrauterine growth restriction, prematurity, and death. Preeclampsia is also recognized as a major risk factor for cardiovascular disease later in life for both the woman and her child [5]. Despite considerable research, the only effective treatment for preeclampsia is to deliver the baby, placenta, and all products of conception.

Maternal endothelial dysfunction is a classic hallmark of preeclampsia. Many markers of endothelial dysfunction have been reported in preeclamptic women, including an imbalance of anticoagulation and procoagulation factors and increased levels of fibronectin, endothelial cell adhesion molecules, and other factors in the coagulation cascade [6]. Increased levels of circulating lipids result in their accumulation within endothelial cells. This accumulation decreases the release of prostacyclin, resulting in oxidative stress via endothelial dysfunction, a key mechanism in the proposed pathophysiology of preeclampsia [7].

Aims and objectives

The main objective of the study is to analyse the level of maternal serum triglycerides in women with pre-eclampsia.

MATERIAL AND METHODS:

This cross sectional study was conducted in Lahore general hospital, Lahore during October 2018 to January 2019. The data was collected from 120 female patients. The age range was 20 to 40 years. Eclampsia was diagnosed in previously normotensive women with two repeat (at least 4 h apart) diastolic blood pressure measurements of 90 mmHg or greater after the 20th week of gestation. A total volume of 5 ml of venous blood was drawn from the antecubital vein. The sera after separating from blood samples were stored at −80°C until further analysis. Serum triacylglycerol was estimated by the enzymatic colorimetric method (GPO-PAP), using kit method.

Statistical analysis

Data was analysed using SPSS for Windows (version 17.0, SPSS Inc., Chicago, Illinois, USA). The data is presented descriptively, providing the number of women, mean values and standard deviations.

RESULTS:

The data was collected from 120 pregnant females. The mean age was 25.67±3.45 years. Mean serum triglyceride concentartions in pre-eclamptic and controls normal pregnant women were 3.1 (0.8) mmol/l and 2.5 (0.9) mmol/l respectively. There was significantly high serum triglyceride concentration ($P < 0.01$) in the pre-eclamptic group than in the normal pregnant women. No significant differences were observed in other measured lipid profile including total cholesterol, HDL and LDL.

Table 01: Levels of serum TG in control and patients group

Serum lipids (mmol/l)	Mean (SD)		*P* value
	Pre-eclampsia (*n*=40)	Normal (*n*=80)	
Total cholesterol	6.7 (1.3)	6.4 (1.3)	0.284
HDL	1.5 (0.3)	1.5 (0.4)	0.817
LDL	3.9 (1.1)	3.8 (1.0)	0.561
Triglyceride	3.1 (0.8)	2.5 (0.1)	<0.01*

SD: Standard deviation, HDL: High-density lipoprotein, LDL: Low-density lipoprotein, *Significant difference at *P*<0.01

DISCUSSION:

Enquobahrie *et al*. assessed serum lipid levels in 57 patients with pre-eclampsia and 510 pregnant women in the control group and they found significantly higher levels of triglycerides in pre-eclampsia. The association between hypertriglyceridemia and pre-eclampsia at 28-37 weeks gestation was evaluated in a study in the United States. In that study pregnant women with pre-eclampsia had a significant increase in the plasma triglyceride levels than in controls [6]. In another study performed in Spain, at 20 and 34 weeks gestation, triglyceride levels were significantly higher in women with severe gestational hypertension than in controls, which is also in agreement with our findings. However, it is worth mentioning a few previous studies, which have not mentioned any differences in lipid parameters in both groups [7].

In the pathogenesis of pre-eclampsia, the initiating event has been postulated to be the reduced placental perfusion that leads to widespread dysfunction of the maternal vascular endothelium by mechanisms that are not well-defined. Mikhail *et al*. described that increased serum triglyceride levels leads to its increased endothelial accumulation, which may results in endothelial dysfunction in pregnancy. Increased triglycerides in pre-eclampsia are likely to be deposited in uterine spiral arteries and contribute to the endothelial dysfunction, both directly and indirectly through generation of small, dense LDL [8].

Dyslipidemia in preeclamptic women is characteristic of what occurs in insulin-resistant, hyperglycemic women who are not pregnant, many of whom also have the clustering of metabolic syndrome characteristics that include hypertension [9]. This suggests that a similar pathophysiological process may be occurring in women with preeclampsia and could be contributing to the dyslipidemic changes. Insulin resistance and type 2 diabetes are characterized by the increased overproduction of the triglyceride-rich very-low-density lipoprotein cholesterol and subsequent increased levels of other triglyceride-rich lipoproteins, which are included in non-HDL-C and reflected in elevated triglyceride levels [10].

CONCLUSION:

It is concluded that total cholesterol, triglyceride, non-HDL-C, and HDL-C levels measured during pregnancy are significantly related to the risk of preeclampsia.

REFERENCES:

1. Iftikhar U, Iqbal A, Shakoor S. Relationship between leptin and lipids during pre-eclampsia. J Pak Med Assoc. 2010;60(6):432–435.
2. Koçyigit Y, Atamer Y, Atamer A, et al. Changes in serum levels of leptin, cytokines and lipoprotein in pre-eclamptic and normotensive pregnant women. Gynecol Endocrinol. 2004;19(5):267–273.
3. Sahu S, Abraham R, Vedavalli R, et al. Study of lipid profile, lipid peroxidation and vitamin E in pregnancy induced hypertension. Indian J Physiol Pharmacol. 2009;53(4):365–369.
4. Uzun H, Benian A, Madazli R, et al. Circulating oxidized low-density lipoprotein and paraoxonase activity in preeclampsia. Gynecol Obstet Invest. 2005;60(4):195–200.
5. National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III) Third report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III) final report. Circulation. 2002;106(25):3143–3421.
6. Moher D, Liberati A, Tetzlaff J, et al. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA Statement. J Clin Epidemiol. 2009;62(10):1006–1012.

7. Stroup DF, Berlin JA, Morton SC, et al. Meta-analysis of observational studies in epidemiology: a proposal for reporting. Meta-analysis Of Observational Studies in Epidemiology (MOOSE) Group. JAMA. 2000;283(15):2008–2012.
8. Wells GA, Shea B, O'Connell D, et al. The Newcastle-Ottawa Scale (NOS) for assessing the quality if nonrandomised studies in meta-analyses. 2009.
9. Robinson JG, Wang S, Jacobson TA. Meta-analysis of comparison of effectiveness of lowering apolipoprotein B versus low-density lipoprotein cholesterol and nonhigh-density lipoprotein cholesterol for cardiovascular risk reduction in randomized trials. Am J Cardiol. 2012;110(10):1468–1476.
10. Borenstein M, Hedges LV, Higgins JPT, et al. Introduction to Meta-analysis. 1st ed. West Sussex, United Kingdom: Wiley; 2009.