Raised Triglyceride Level is A Risk Factor for Pre-Eclampsia

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ABSTRACT

Objective: The objective of this study is to determine the elevated triglyceride level as a risk factor for pre-eclampsia.

Study design: Analytical study: case control design.

Place and duration of study: This study was conducted at the Department of Obstetrics and Gynecology Unit-I Fatima Jinnah Medical College/ Sir Ganga Ram Hospital, Lahore, during the period of six months (1-4-2009 to 31-09-2009).

Subjects and Methods: One hundred and twenty pregnant women presenting to obstetrics and gynaecology unit-I, Sir Ganga Ram Hospital Lahore, through emergency as well as outdoor fulfilling the inclusion criteria were included in the study. Out of which sixty normotensive were at term and sixty with blood pressure ≥140/90mmHg and proteinuria +2 at ≥20 weeks of gestation. Fasting triglyceride level was carried out by standard kit method.

Results: The mean age of patients in study group was 28.8±3.1 years and in control group were 28.7±3.1 years. The mean body mass index (BMI) in study group was 26.8±2.2 kg/m^2 and in control group was 24.7±1.8 kg/m^2. The mean serum triglyceride in study group was 195.1±32.8 mg/dl and in control group was 167.2±24.8mg/dl. In study group, 27 (45%) patients had raised serum triglyceride level and 33 (55%) patients had normal serum triglyceride level and in control group, 10 (16.7%) patient had raised serum triglyceride level and 50 (83.3%) patients had normal serum triglyceride level.

Conclusion: It is concluded from this study that there is an association between raised serum triglyceride levels and pre-eclampsia as in our study 45% patients had raised serum triglyceride level while in control group serum triglyceride level was raised only in 16.7% patients.

Keywords: Pre-eclampsia, raised triglyceride, risk factor, blood pressure.

INTRODUCTION

Pre-eclampsia is characterized by development of hypertension and proteinuria after 20 weeks of gestation[1,2]. It is a common hypertensive disorder of pregnancy affecting 2-5% of pregnancies[3]. Pre-eclampsia is associated with increased maternal and perinatal mortality and morbidity[4,5].

Early pregnancy dyslipidemia (at an average of 13week gestation) is associated with an increased risk of pre-eclampsia[6]. Elevated triglyceride rich lipoprotein might cause endothelial damage leading to pre-eclampsia[7]. Abnormal lipid metabolism has been proposed as a pathogenic factor of pre-eclampsia, although whether it is a constant feature in all pre-eclamptic patients is unclear.

Pre-eclampsia may develop from 20 week of gestation (it is considered early onset before 32 week, which is associated with increased morbidity). Its progress differs among patients; most cases are diagnosed pre-term. Pre-eclampsia may also occur up to six weeks post-partum. Apart from Caesarean section or induction of labour (and therefore delivery of the placenta), there is no known cure. It is the most common of dangerous pregnancy complications; it may affect both the mother and the unborn child[8].

The hypertension component of the disease is present when systolic blood pressure is greater than 140 mmHg or diastolic blood pressure is greater than 90mmHg in a woman known to be normotensive prior to pregnancy. The diagnosis requires 2 such abnormal blood pressure measurements recorded at least 6 hours apart.

Proteinuria is present when the urinary protein concentration is greater than 300mg during a 24-hour period. The 24 hour urine collection is the definitive test to diagnose proteinuria; however, if it is not available, then a concentration of at least 30mg/dl (at least 1+ on dipstick testing) in at least

2 random urine samples collected at least 6 hours apart may be used.

Nearly 10% of women with severe pre-eclampsia and 30-50% of women with eclampsia are affected by hemolysis, elevated liver enzymes and low platelet count (HELLP) syndrome. Women with pre-eclampsia and HELLP syndrome develop hepatocellular necrosis and liver dysfunction. They also have an increased mortality rate, and one third of women with pre-eclampsia develop disseminated intravascular coagulation[9].

There currently are no well established measures for preventing pre-eclampsia[10]. Both low dose aspirin therapy and calcium supplementation have been studied as preventive measures but have not been shown to be beneficial in the general pregnant population and are not recommended for primary prevention of pre-eclampsia. Some evidence does support the use of low dose aspirin therapy and daily calcium supplementation in certain high risk women. Low dose aspirin therapy has been shown to reduce the incidence of pre-eclampsia in women who were found to have an abnormal uterine artery on Doppler ultrasound examination performed in second trimester[11].

The rationale of the study is that if my study proves raised triglyceride as risk factor for pre-eclampsia, then it will add new knowledge for obstetrician to investigate triglyceride level in high risk pregnant women during their antenatal visits and it will help in detection of high risk group, early and proper management and health education of women.

RESULTS

In our study, the mean age of the patients in study group was 28.8±3.1 years and in control group were 28.7±3.1 years. In study group, there were 45(75%) patients in age range of 25-30 years and 15(25%) patients in the age range of 31-35 years. In control group, there were 46(76.7%) patients in the age range of 25-30 years and 14(23.3%) patients in age range of 31-35 years (Table-I).

The mean duration of marriage in study group was 3.2±1.7 years and in control group were 3.1±1.6 years. In study group, there were 24(40%) patients had duration of marriage range of 1-2 years, 21(35%) patients had duration of marriage range of 3-4 years, 9(15%) patients had duration of marriage range of 5-6 years and 6(10%) patients had duration of marriage range of 7-8 years. In control group, there were 26(43.3%) patients had duration of marriage range of 1-2 years, 18(30%) patients had duration of marriage range of 3-4 years, 11(18.3%) patients had duration of marriage range of 5-6 years and 5(8.3%) patients had duration of marriage range of 7-8 years(Table-2).

The mean parity of the patients in study group was 1.8±0.8 para and in control group was 1.7±0.8 para. In study group, there were 21(35%) patients had zero para, 33(55%) patients had 1-2 para and 6(10%) patients had 3-4 para. In control group, there were 18(30%) patients had zero para, 36(60%) patients had 1-2 para and 6(10%) patients had 3-4 para (Table-3).

Table I: Distribution of patients by age

Age (years)	Study Group (n=60)		Control Group (n=60)	
	No.	percentage	No.	percentage
25-30	45	75.0	46	76.7
31-35	15	25.0	14	23.3
Mean±SD	28.8±3.1		28.7±3.1	

n   number of patients   SD   Standard deviation

Table 2: Distribution of patients by duration of marriage

Duration (years)	Study Group (n=60)		Control Group (n=60)	
	No.	percentage	No.	percentage
1-2	24	40.0	26	43.3
3-4	21	35.0	18	30.0
5-6	9	15.0	11	18.3
7-8	6	10.0	5	8.3
Mean±SD	3.2±1.7		3.1±1.6	

n   number of patients   SD   Standard deviation

Table-3: Distribution of patients by parity

Parity	Study Group (n=60)		Control Group (n=60)	
	No.	percentage	No.	percentage
0	21	35.0	18	30.0
1-2	33	55.0	36	60.0
3-4	6	10.0	6	10.0
Mean±SD	1.8±0.8		1.7±0.8	

n   number of patients
SD   Standard deviation

Table 4: Distribution of patients by body mass index

BMI (kg/m^2)	Study Group (n=60)		Control Group (n=60)	
	No.	percentage	No.	percentage
18-21	11	18.3	18	30.0
22-24.9	24	40.0	36	60.0
≥25	25	41.7	6	10.0
Mean±SD	26.8±2.2		24.7±1.8	

n   number of patients
SD   Standard deviation
BMI   body mass index

Table 5: Distribution of patients by serum triglyceride

Serum triglyceride (mg/dl)	Study Group (n=60)		Control Group (n=60)	
	No.	percentage	No.	percentage
<150	33	55.0	50	83.3
>150	27	45.0	10	16.7
Mean±SD	195.1±32.8		167.2±24.8	

n   number of patients
SD   Standard deviation

Table 6: Distribution of patients by raised serum triglyceride

Raised serum triglyceride	Study Group (n=60)		Control Group (n=60)	
	No.	percentage	No.	percentage
Yes	27	45.0	10	16.7
No	33	55.0	50	83.3
Total	60	100.0	60	100.0

Odd Ratio 4.09 (significant)
95% confidence interval from 2.15 to 13.30
n   number of patients

The mean body mass index (BMI) in study group was 26.8±2.2 kg/m^2 and in control group was 24.7±.82 kg/m^2. In study group, there were 11(18.3%) patients had BMI range of 18-21 kg/m^2, 24 (40%) patients had BMI range of 22-24.9kg/m^2 and 25(41.7%) patients had BMI range of ≥25

kg/m^2. . In control group, there were 18(30%) patients had BMI range of 18-21 kg/m^2, 36(60%) patients had BMI range of 22-24.9kg/m^2 and 6(10%) patients had BMI range of ≥25 kg/m^2(Table-4).

The mean serum triglyceride in study group was 195.1±32.8 mg/dl and in control group was 167.2±24.8mg/dl. In study group, 33(55%) patients had serum triglyceride of less than 150mg/dl and 27(45%) had serum triglyceride of more than or equal to 150mg/dl. In control group, 50(83.3%) patients had serum triglyceride of less than 150mg/dl and 10(16.7%) had serum triglyceride of more than or equal to 150mg/dl (Table-5).

In study group, 27(45%) patients had raised serum triglyceride levels and 33(55%) patients had normal serum triglyceride level and in control group, 10(16.7%) patients had raised serum triglyceride levels and 50(83.3%) patients had normal serum triglyceride level (Table-6).

DISCUSSION

Pre-eclampsia and related disorders are known to affect functions of various organs involved in lipid and lipoprotein metabolism. Several studies have shown that endothelial dysfunction is related to hyperlipidemia[12]. Significantly elevated plasma concentration of triglycerides, phospholipids and total lipids and decreased high density lipoprotein concentration were found in women with pre-eclampsia in comparison to normal pregnancy[13].

In our study, the mean age of patients in study group was 28.8±3.1 years and in control group were 28.7±3.1 years. As compared with the study of Bodnar et al[14] the mean age of patients in pre-eclampsia group was 25.3±6.1 years and 25.3±6.1 years in normal pregnant group, which is comparable with our study.

In our study the mean body mass index in study group was 26.8±2.2kg/m^2 and in control group was 24.7±1.8kg/m^2. As compared with the study of Kashinakunti et al[15] the BMI of patients in cases group was 26.8±3.3kg/m^2 and in control group was 25.5±3.1kg/m^2 which is comparable with our study.

In our study, the mean serum triglyceride in study group was 195.1±32.8 mg/dl and in control group was 167.2±24.8mg/dl. As compared with study of Kashinakunti et al[15] the mean serum triglyceride level in study group was 214.8±51.5 mg/dl and in control group was 187.7±40.9mg/dl which is comparable with our study.

In another study conducted by Baker et al[16] The mean serum triglyceride in study group was 200±79.5 mg/dl and in control group was 187.7±40.9mg/dl while in our study the mean serum triglyceride in study group was 195.1±32.8 mg/dl and in control group was 167.2±24.8mg/dl which is comparable with above study.

In our study, the raised serum triglyceride in study group was in 45% patients and in control group was in 16.7% patients. As compared with the study of Lluurba et al[17] the raised serum triglyceride in pre-eclamptic group was in 47% patients and in control group was in 13% of patients which is comparable with our study.

CONCLUSION

It is concluded from this study that there is an association between raised triglyceride levels and pre-eclampsia as in our study 45% patients had raised serum triglyceride level while in control group serum triglyceride level was raised in only 16.7% patients.

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