Objective: To determine the relationship between lipid profile abnormalities and preeclampsia in pregnant women.

Methodology: This cross-sectional study was done in the Obstetrics and Gynecology Department of District Headquarter Hospital, Rawalpindi, Pakistan from June 2018 to May 2019. A total of 130 women of preeclampsia were selected. Lipid profile abnormalities were evaluated using a fasting blood sample from the hospital laboratory. All data related to eclampsia, demographic features and lipid profile abnormalities were recorded.

Results: Mean age of women was 33.1+5.1 years (range 21-40). Mean gestational age was 34.4+7.3 weeks. Of the total number of women, the multipara constituted 85(65.38%) and the primi para were 45(34.62%). Women living in cities constituted 70(53.85%) and rural women were 60(46.15%). Mild pre-eclampsia was observed in 74(56.92%) and severe preeclampsia in 56(43.08%) women. Hyperlipidemia was found to be significantly associated with the severity of the preeclampsia (p=0.03).

Conclusion: Lipid profile abnormalities are significantly associated with preeclampsia, meaning that it is the main risk factor for eclampsia. (Rawal Med J 202;46:873-876).

Keywords: Pregnancy, preeclampsia, hyperlipidemia.
Full clinical examination and routine laboratory examinations were performed. Preeclampsia was divided into two categories and defined as mild preeclampsia (SBP> 140 and DBP> 90) and severe preeclampsia (SBP> 160 and DBP> 110). Pregnancy age was calculated on the basis of menstruation and confirmed by ultrasound. Blood pressure was recorded using a standard mercury sphygmomanometer. Urine was collected for 24 hours to determine the amount of proteinuria by photometric reading after addition of sulfosalicylic acid. Blood samples were taken after a 12-hour rapid procedure using 5 ml tubes containing ethylenediaminetetraacetic acid (EDTA). Total serum cholesterol was measured by the methods of CHOD (cholesterol oxidase) POD (peroxidase).

**Statistical Analysis:** The data were analyzed by using SPSS version 20. Mean and standard deviation were calculated for quantitative variables such as age, BMI and blood pressure. T test was performed to determine the comparison of the lipid profile between mild and severe preeclampsia. p<0.05 was considered significant.

**RESULTS**
The study included 130 women with preeclampsia. Mean age was 33.1±5.1 years (range 21-40). Mean gestational age was 34.4±7.3 weeks. Average body mass index (BMI) was 24.6±3.20. Of the total number of women, the multipara constituted 85(65.38%) and the primi para were 45(34.62%). Most women living in cities constituted 70/53.85% and rural women were 60(46.15%) (Table 1).

<table>
<thead>
<tr>
<th>Basic characteristics</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>Patients age (mean+SD)</td>
<td>33.1±5.1 years</td>
</tr>
<tr>
<td>Gestational age (mean+SD)</td>
<td>34.4±7.3 weeks</td>
</tr>
<tr>
<td>BMI</td>
<td>24.6±3.20</td>
</tr>
<tr>
<td>Parity</td>
<td></td>
</tr>
<tr>
<td>Primigravida</td>
<td>45(34.62%)</td>
</tr>
<tr>
<td>Multi</td>
<td>85(65.38%)</td>
</tr>
<tr>
<td>Residence</td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>60(46.15%)</td>
</tr>
<tr>
<td>Urban</td>
<td>70(53.85%)</td>
</tr>
</tbody>
</table>

**Table 1. Demographic characteristics of women (N= 130).**

**Table 2. Blood pressure of women.**

<table>
<thead>
<tr>
<th>Blood pressure</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild pre-eclampsia (BP &gt;140/90 mm Hg)</td>
<td>74(56.92%)</td>
</tr>
<tr>
<td>Severe pre-eclampsia (BP &gt;160/110 mm Hg)</td>
<td>56(43.08%)</td>
</tr>
</tbody>
</table>

**Table 3. Lipid profile abnormalities according to severity of pre-eclampsia.**

<table>
<thead>
<tr>
<th>Lipid profile</th>
<th>Mild pre-eclampsia</th>
<th>Severe pre-eclampsia</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cholesterol</td>
<td>243.40±55.96</td>
<td>271.74±45.55</td>
<td>0.03</td>
</tr>
<tr>
<td>HDL</td>
<td>49.48±12.11</td>
<td>41.90±13.16</td>
<td></td>
</tr>
<tr>
<td>LDL</td>
<td>116.14±49.22</td>
<td>156.58±34.30</td>
<td></td>
</tr>
<tr>
<td>TG</td>
<td>276.01±66.10</td>
<td>383.32±91.53</td>
<td></td>
</tr>
</tbody>
</table>

Mild pre-eclamptic cases were 74(56.92%) and severe preeclampsia in 56(43.08%) (Table 2). Abnormalities in the lipid profile were significantly associated with the severity of the preeclampsia (p=0.03). The average total cholesterol in women with mild eclampsia was 243.40±55.96, while in severe eclamptic women it was 271.74±45.55 (Table 3). Similarly, LDL and TG were found to be significantly higher in women with severe eclampsia compared to mild preeclampsia.

**DISCUSSION**
In under developed countries where access to medical services is incomplete, preeclampsia is a leading source of maternal deaths, causing a total of 60,000 maternal deaths per year. There are many risk factors. This study was conducted to assess lipid profile abnormalities in women with preeclampsia and found that lipid profile abnormalities are an important risk factor for preeclampsia. A study found that abnormalities such as high lowered HDL levels in the lipid profile and significantly higher total cholesterol, LDL, VLDL and TG in preeclampsia. Another study found that there were abnormalities in the lipid profile and in lipid metabolism and increased TG levels as well as delayed TG clearance and hypertension in preeclampsia was noted. It has been consistently reported that there is also a positive correlation between the highest levels of
VLDDL and triglycerides and the increase in proteinuria in women with preeclampsia and plasma lipid levels were higher in women with preeclampsia than in pregnant women with normal blood pressure. It is thought that the lipid disorder plays a role in endothelial cell damage, a characteristic preeclampsia symptom. In our study, the majority of women were with mild preeclampsia. This difference may be due to our exclusion of other strong risk factors for eclampsia. Another study found that dyslipidemia may be an important cofactor for preeclampsia, resulting in a significant positive correlation between proteinuria and total cholesterol, TG, LDL and VLDL. There were significant negative correlation between proteinuria and the HDL concentrations r: -0.202, also there was positive correlations between systolic hypertension and the levels of the cholesterol, TG and VLDL, and between diastolic blood pressure and levels of the LDL, TG and VLDL. Similar results were found with an average age of 29 years and an average gestational age in women with preeclampsia was 36 weeks.

CONCLUSION

Lipid profile abnormalities are a major risk factor for preeclampsia. Therefore, it is very important to analyze the lipid profile during prenatal care in pregnant women to reduce maternal and fetal morbidity and mortality due to preeclampsia.

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Conception and design: Sadiq Jan
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Analysis and interpretation of data: Sadiq Jan, Sobia Nawaz
Drafting of the article: Sadiq Jan
Critical revision of article for important intellectual content: Sadiq Jan, Sobia Nawaz
Statistical expertise: Sadiq Jan
Final approval and guarantor of the article: Sadiq Jan
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