EVALUATION AND CORRELATION OF FOETOPLACENTAL WEIGHT WITH PLATELET COUNT IN TOXEMIA OF PREGNANCY.

Anatomy

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ABSTRACT

Toxemia of pregnancy is a scantily understood condition of human pregnancy, which can influence multiple organs and is a foremost reason of maternal mortality worldwide. There is also indication that preeclampsia is usually related with placental hypoxia and endothelial dysfunction. Many researchers gave their efforts to recognize the exclusive screening test that would predict the risk of developing preeclampsia before the typical symptoms appear. There are number of studies which suggest platelet may play a chief role in the etiopathogenesis of preeclampsia. The present study done in 170 pregnant mothers divided into four groups. 40 cases of mild preeclampsia, 40 cases of severe preeclampsia, 40 cases of eclampsia and 50 cases of control (Normotensive) pregnant women admitted in Department of Obs and Gynae, Rama Medical College, hospital and research centre. There was significant difference between platelet counts of eclampsia(<0.0001), severe preeclampsia(0.0002),mild preeclampsia(P=0.0004) when compared to control group. In this present study the mean placental, birth weights were low in different grades of toxemia of pregnancy when compared with control group. Morphometrical parameters of foetus, placenta positively correlating with platelet count. Platelet count may be considered as an early, economical and quick method to estimate the severity of toxemia of pregnancy. It can also be a useful screening test for early recognition and to assess the prognosis of the disease and outcome in pregnant women.

KEYWORDS

Pregnancy Induced Hypertension (PIH),Preeclampsia, Eclampsia, Platelet count, Hematological marker, weight of placenta and foetus.

1. INTRODUCTION

Hypertensive disorders complicating pregnancy (Toxaemia of pregnancy) are common and forming a deadly triad along with haemorrhage and infection[5]. Pre-eclampsia (PE) is considered severe if one or more of the following criteria are present: Blood pressure >140 mm Hg or higher systolic or >90 mm Hg or higher diastolic after 20 weeks of gestation in a woman with previously normal blood pressure. Proteinuria: 0.3 g or more of protein in a 24-hour urine collection (usually correspond with 1+ or greater on a urine dipstick test) known as mild preeclampsia[6]. When systolic blood pressure of >160 mmHg or higher or >110 mmHg or higher diastolic on two occasions at least six hours apart in a woman on bed rest, the condition is known as severe preeclampsia. It is associated with proteinuria and oliguria, Cerebral or visual disturbances, seizures, Pulmonary oedema, cyanosis, Epigastric pain or right upper quadrant pain, Impaired liver function, Thrombocytopenia and Foetal growth restriction known as eclampsia[7].

Maternal hypertension (toxaemia of pregnancy) is diagnosed in 6-10% of all deliveries; is associated with 22% of all perinatal foetal deaths and 30% of all maternal deaths[8].

Preeclampsia is a scantily understood condition of human pregnancy, which can influence multiple organs and is a foremost reason of maternal mortality worldwide[9]. The exact pathophysiology of preeclampsia is not yet fully understood. However abnormal placentation is one of the initial events[10]. There is also indication that preeclampsia is usually related with placental hypoxia and endothelial dysfunction[11]. Many researchers gave their efforts to recognize the exclusive screening test that would predict the risk of developing preeclampsia before the typical symptoms appear. There are number of studies which suggest platelet may play a chief role in the etiopathogenesis of preeclampsia. Changes in coagulation system in eclampsia are well known[12]. Out of all haematological changes that occur in preeclampsia, thrombocytopenia is the most familiar. Thrombocytopenia is typically defined as a platelet count less than 150,000/mm3. Thrombocytopenia is a well-documented procedure in preeclampsia, thereby maternal mortality might be reduced through serial monitoring of platelet count as a part of antenatal check-up. But very few studies are present on this ground in our country. Therefore the present study is designed to evaluate the relationship of platelet count with toxemia of pregnancy.

2. MATERIALS AND METHODOLOGY

The present study has done in 170 pregnant mothers, divided into four groups. 40 cases of mild preeclampsia, 40 cases of severe preeclampsia, 40 cases of eclampsia, 50 cases of control (Normotensive) pregnant women admitted in Department of Obs and Gynae, Rama Medical College, hospital and research centre. Inclusion criteria: Antenatal mothers who did not have hypertension at the time of pregnancy and without any other abnormalities taken in to control group. Antenatal mothers diagnosed with toxemia of pregnancy with their blood pressure of >140/90mmHg or more after 20th week of pregnancy in to test group. Exclusion criteria: Antenatal mothers with the history of renal, liver failure, seizures hypertensive disorder before the pregnancy and other medical problems. Before the conduction of this study, permission has taken from the institution ethical committee and written consent of cases and controls. 1.5 ml of blood was drawn from ante-cubital vein and collected in an EDTA containing tube for counting platelet. Platelet count was done by Sysmex 800i fully automated hematology analyzer. The placenta with cord and membranes were collected and examined immediately after the delivery for abnormality of the umbilical cord and membranes. The umbilical cord and chorion were trimmed from all placenta. The umbilical cord was cut at a distance of 10 centimeters from the site of insertion. Placentae were washed in slow running tap water, dried with the help of blotting paper. The placenta along with the umbilical cord were given code numbers and were preserved in 10% formalin solution. The placenta were weighed with a standard weighing machine. The fetal weight was noted from the case records provided by the department of obstetrics and gynecology.

2.1. STATISTICAL ANALYSIS:

Statistical analysis was performed by using computer based software, Statistical Package for Social Science (SPSS). Mean values of parameters were compared to determine the differences between two groups by using Student's unpaired 't' test. For all statistical analysis, two tailed 'p' value < 0.05 was considered as a lowest level of significance.

3. RESULTS

The study sample was 170. Distributed in to 40 samples of mild preeclampsia, 40 samples of severe preeclampsia, 40 samples of eclampsia and 50 cases of normotensive mothers. For comparing the platelet count and to determine its increasing or decreasing trends, the mean value for each group was determined. There was significant
difference between platelet counts of eclampsia (P<0.0001), severe preeclampsia (P<0.0002), mild preeclampsia (P=0.0004) when compared to control group. The mean weight of placenta and foetus also decreased significantly in eclampsia, severe and mild preeclampsia when compared with control group of placenta and fetuses. For comparing the platelet count, placental and fetal weight to determine its increasing or decreasing trends, the mean value for each group was determined.

### Table 1. Comparison Of Placentae Weight In Between Control And Case With Sub Groups.

<table>
<thead>
<tr>
<th>Groups</th>
<th>No of samples</th>
<th>Mean±S.Dev (Gams)</th>
<th>P Value compared with control group</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Control</td>
<td>50</td>
<td>470.15±95.00</td>
<td>—</td>
</tr>
<tr>
<td>II. Mild PET</td>
<td>40</td>
<td>351.62±96.9</td>
<td>&lt;0.0042</td>
</tr>
<tr>
<td>II. Severe PET</td>
<td>40</td>
<td>272.14±79.80</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>IV. Eclampsia</td>
<td>40</td>
<td>228.04±73.4</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

### Table 2. Comparison Of Fetal Weight In Between Control And Case With Sub Groups.

<table>
<thead>
<tr>
<th>Groups</th>
<th>No of samples</th>
<th>Mean±S.Dev (Kg)</th>
<th>P Value compared with control group</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Control</td>
<td>50</td>
<td>2.91±0.36</td>
<td>—</td>
</tr>
<tr>
<td>II. Mild PET</td>
<td>40</td>
<td>2.32±0.81</td>
<td>&lt;0.038</td>
</tr>
<tr>
<td>II. Severe PET</td>
<td>40</td>
<td>1.82±0.48</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>IV. Eclampsia</td>
<td>40</td>
<td>1.68±0.54</td>
<td>&lt;0.0001</td>
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### Table 3. Comparison Of Platelet Count In Between Control And Case With Sub Groups.

<table>
<thead>
<tr>
<th>Group</th>
<th>No of subjects</th>
<th>Mean±s.dev (Lacs/cumm)</th>
<th>P value compared with control group</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Control</td>
<td>50</td>
<td>2.30+/− 0.61</td>
<td>—</td>
</tr>
<tr>
<td>II. Mild PET</td>
<td>40</td>
<td>1.76+/− 0.55</td>
<td>=0.0004</td>
</tr>
<tr>
<td>II. Severe PET</td>
<td>40</td>
<td>1.69+/− 0.64</td>
<td>=0.0002</td>
</tr>
<tr>
<td>IV. Eclampsia</td>
<td>40</td>
<td>1.30+/− 0.27</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

### Table 4. Comparison Of Fertoplacental Weight And Platelet Count In Between Control And Case With Sub Groups.

<table>
<thead>
<tr>
<th>Groups</th>
<th>No of samples</th>
<th>Placental weight mean±S.Dev (Gams)</th>
<th>Fetal weight mean±S.Dev (kg)</th>
<th>Platelet count Mean+/− s.dev (Lacs/cumm)</th>
<th>P Value compared with control group</th>
</tr>
</thead>
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### 4. DISCUSSION

Toxemia of pregnancy is one of the most common obstetric problems seen in pregnant women. The obstetrician relies gradually more upon laboratory tests for the management of pregnant women suffering from toxemia of pregnancy. Estimation of platelet indices is a reliable and economical method. In this study tried to show the platelet count and its association with toxemia of pregnancy. In Present Study Significant lower platelet count was observed among pregnant women with toxemia of pregnancy compared to individuals from control group. A relationship between low platelet count and PIH is found in significant toxaemia of pregnancy compared to individuals from control group. A lower platelet count is associated with abnormal activation of coagulation system and is believed to reflect increased platelet consumption Parnas M,et al.,2006 observed in their study.[16]

Mohan et al.[19](1989) reported in that mean placental,foetal weight and fetal placental weight ratio were less in preeclampsia and eclampsia as compared to normal control group and also noticed placental, fetal weight and fetoplacental weight ratio reduced significantly as the severity of the disease increases.[16]

In present study observations shows significant difference in between each group and also seen placenta and foetal weight and platelet count reduces significantly as the severity of disease increases and coincides with above mentioned study results.[16]

In present study observations shows significant difference in between each group and also seen placenta and foetal weight and platelet count reduces significantly as the severity of disease increases and coincides with above mentioned study results. Thus, placenta acts as an effective index by examination of which we can predict the status of foetus in neonatal life as it can act as an indicator to the overall development of the foetus. In present study we observed a specific pattern of disease and its related variation in coagulation status. Finally, with present study results and interpretation with previous worker's studies, came to a conclusion that estimation of platelet count may be considered as an early,economical and rapid method of assessment of severity of PIH cases. It can also be a useful screening test for early detection and to assess the prognosis of the disease and outcome of pregnancy in pregnant women.

### 5. CONCLUSION

From the present study, it can be concluded that, the toxemia of pregnancy adversely influences the weight of the placenta and foetal outcome. Thus, placenta acts as an effective index by examination of which we can predict the status of foetus in neonatal life as it can act as an indicator to the overall development of the foetus. In present study we observed a specific pattern of disease and its related variation in coagulation status. Finally, with present study results and interpretation with previous worker's studies, came to a conclusion that estimation of platelet count may be considered as an early,economical and rapid method of assessment of severity of PIH cases. It can also be a useful screening test for early detection and to assess the prognosis of the disease and outcome of pregnancy in pregnant women.

### 6. REFERENCES


18. Misfelderlohs H, Teran a, Lees C, Albigues C, Nicolaides KH. Platelet changes and subsequent development of pre eclamipsiafoetal growth restriction in women with


