INTRODUCTION

Pregnancy is associated with numerous physiological and pathological changes in platelet number and its functions and which can be of clinical concern. Inherited qualitative and quantitative platelet disorders may also manifest during pregnancy with the risk of bleeding.\(^{(1)}\) Thrombocytopenia or low blood platelet count is encountered in 7-8% of all pregnancies. Obstetricians diagnose thrombocytopenia by automated complete blood cell counts during routine prenatal screening. It can result from a wide range of conditions, several of them being pregnancy related. The normal range of platelets in non-pregnant women is 150,000-400,000/μL. Average platelet count in pregnancy is decreased (2,13,000/μL versus 2,50,000/μL). Decrease in the platelet count is due to hemodilution, increased platelet consumption, and increased platelet aggregation driven by increased levels of thromboxane A\(_2\).\(^{(2)}\) The modern recognition of the condition is mainly attributable to automated complete blood count, which routinely includes platelet count. Most of this decrease occurs during the third trimester and is associated with a shift in the histogram of platelet count distribution. There is a physiological fall in the platelet count with a leftward shift in platelet distribution. The cause for this decrease is multifactorial and is related to hemodilution, increased platelet consumption and increase in platelet aggregation driven by increased level of TXA2. This is supported by the fact that platelet count may also be lower in twin pregnancy when compared to singleton pregnancies. But pregnant woman with thrombocytopenia have lower bleeding complications when compared to non pregnant women because of procoagulant state induced by increased levels of fibrinogen, factor VIII, VWF, suppressed fibrinolysis and reduced protein S activity.\(^{(3)}\) The majority of thrombocytopenic pregnant women is healthy, has no history of thrombocytopenia, and is incidentally diagnosed by blood testing.\(^{(4)}\) Most
cases of thrombocytopenia in pregnancy are mild, and have no adverse outcome for either mother or baby, occasionally a low platelet count may be part of a more complex disorder with significant morbidity and may be life threatening.[5]

Thrombocytopenia in pregnancy may be an isolated finding or it may be associated with systemic disorders like severe preeclampsia, HELLP syndrome (hemolysis, elevated liver enzymes, low platelets), or AFLP (acute fatty liver of pregnancy). Furthermore, autoimmune diseases, including systemic lupus erythematosus, antiphospholipid syndrome, thrombotic thrombocytopenic purpura, haemolytic uremic syndrome, and immune thrombocytopenia (ITP) may relapse or be first detected during pregnancy resulting in thrombocytopenia.[6]

Thrombocytopenia carries a risk for both the mother and her foetus, associated with substantial maternal or neonatal morbidity & mortality. However a specific therapy, if instituted promptly, improves the outcome of affected patients and their offspring. Thrombocytopenia during pregnancy is an underexplored condition in Indian women, so the present study was conducted to study maternal and fetal outcome in pregnant women presenting with thrombocytopenia.

**MATERIALS AND METHODS**

Study Design- This Hospital based Cross sectional & Observational study was conducted in the department of Obstetrics & Gynaecology at Sushila Tiwari Hospital, Haldwani over a period of JAN 2021-SEPT 2022 on pregnant women with singleton pregnancy with gestational age ≥ 37 week admitted in Obstetrics & Gynaecology ward & found to have thrombocytopenia on investigation.

**Sample Size:** Assuming the prevalence of 10% and margin of error 5%. Sample size was calculated along with loss to follow up is 155.

**Inclusion Criteria**
- Pregnant woman who was willing to participate in the study.
- All pregnant women ≥ 37 wk of gestational age, with platelet count less than 1,50,000/µL.

**Exclusion Criteria**
- Women with known history of
  - Patient who was not willing for study.
  - Pancytopenia
  - Bone marrow suppression
  - Previous bad obstetric history
  - Known case of APLA

**Methodology**
- ANC patient ≥ 37 wk of gestational age admitted in Obstetrics & Gynaecology ward with thrombocytopenia were enrolled in the study.
- Demographic features, detailed history, presenting complaints if any, findings of general, systemic and obstetrical examination including pelvic examination if required of all the patient was recorded in approved proforma.
- Baseline investigations like Complete haemogram, blood group and Rh typing, urinalysis, VDRL, HBsAg, HCV and HIV serology and LFT, KFT were carried out in all subjects. Coagulation profile (PT, APTT etc) was done in patients found to have thrombocytopenia.
- History of petechiae, bruising, drug usage, viral infection, thrombocytopenia in previous pregnancy was taken.
- The data was collected on printed proforma which included clinical details regarding demographic data, presenting complaints, obstetric and menstrual history, symptoms of thyroid dysfunction, associated medical illness like hypertension or other cardiovascular diseases, diabetes mellitus, drug history and general physical examination systemic examination, obstetrics examination including pelvic examination was done.
- Duration of pregnancy at the time of delivery, indication of induction and method (if required) and mode of delivery including indication for instrumental delivery or caesarean section were recorded. Neonates of all cases were tested for thrombocytopenia by cord blood sampling.

**Statistical Analysis**

Data was described in terms of range, mean, +/- standard deviation (SD), frequencies (number of cases), and relative frequencies (percentages) as appropriate. Comparison of quantitative variables between the study groups was done using One-Way ANOVA test. For comparing categorical data, the Chi-square test was performed. A probability value (p-value) less than 0.05 was considered statistically significant. All statistical calculations were done using SPSS 21 (Statistical Package for the Social Science) version statistical program for Microsoft Windows.

**RESULTS**

In the present study, 65.8% of subjects were in the age group of <25 years, 21.9% in the age group of 26-30 years, 10.3% in the age group of 31-35 years, 2% were >35 years in age.

In the present study, 43.2% of the subjects were primigravida followed by 38.1% second gravida and 18.7% multigravida.

In the present study, 7.7% of study subjects were in the gestational age of 37-39 years & 92.3% in the gestational age >39 years.

In the present study, 45.2% study subjects showed mild thrombocytopenia, 48.4% had moderate thrombocytopenia & 6.4% had severe thrombocytopenia.

In the present study, 56.8% of study subject showed etiology of gestational thrombocytopenia, 15.5% had etiology of pre-eclampsia, 7.1% had HELLP...
syndrome, 6.4% had gestational hypertension, 3.2% had eclampsia & 2.6% had superimposed pre-eclampsia. In other etiologies, 1.9% had dengue, 3.2% had hypersplenism, 1.3% had DIC, 1.3% had ITP and only 0.7% had malaria as an etiology.

In the present study, associated illness was anemia in 23.2% of subjects, 7.7% had hypothyroidism, 2.6% had chronic hypertension, 0.7% had liver disorders & 65.8% subjects had no associated illness.

In the present study, low birthweight was seen in 73.1% of the subjects whereas 23.9% subjects had normal birth weight baby.

In the present study, APGAR score at 1 minute was ≤7 in 31% of the neonates whereas it was >7 in 69% babies.

In the present study, neonatal thrombocytopenia was not observed in 94.8% of neonates whereas 5.2% neonates showed thrombocytopenia.

In the present study, neonatal mortality was not seen in 96.1% of neonates whereas 3.9% of neonates could not survive.

On comparison of age with severity of thrombocytopenia no significant difference was found between different grades of thrombocytopenia as the p-value is 0.128.

Table 1: Distribution of neonates according to birth weight

<table>
<thead>
<tr>
<th>Neonatal weight</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low birth weight</td>
<td>118</td>
<td>76.1%</td>
</tr>
<tr>
<td>Normal birth weight</td>
<td>37</td>
<td>23.9%</td>
</tr>
<tr>
<td>Total</td>
<td>155</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 2: Distribution of neonates according to APGAR score at 1 min

<table>
<thead>
<tr>
<th>Apgar score at 1 min</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤7</td>
<td>48</td>
<td>31.0%</td>
</tr>
<tr>
<td>&gt;7</td>
<td>107</td>
<td>69.0%</td>
</tr>
<tr>
<td>Total</td>
<td>155</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 3: relation of age with severity of thrombocytopenia

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Severity of thrombocytopenia</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%age</td>
<td>No.</td>
<td>%age</td>
<td>No.</td>
</tr>
<tr>
<td>&lt;25</td>
<td>39</td>
<td>55.7%</td>
<td>55</td>
<td>73.3%</td>
<td>8</td>
</tr>
<tr>
<td>26-30</td>
<td>17</td>
<td>24.3%</td>
<td>15</td>
<td>20.0%</td>
<td>2</td>
</tr>
<tr>
<td>31-35</td>
<td>13</td>
<td>18.6%</td>
<td>3</td>
<td>4.0%</td>
<td>0</td>
</tr>
<tr>
<td>&gt;35</td>
<td>1</td>
<td>1.4%</td>
<td>2</td>
<td>2.7%</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>70</td>
<td>100%</td>
<td>75</td>
<td>100%</td>
<td>10</td>
</tr>
</tbody>
</table>

On comparison of age with severity of thrombocytopenia no significant difference was found between different grades of thrombocytopenia as the p-value is 0.128.

Table 4: relation of gravida with severity of thrombocytopenia

<table>
<thead>
<tr>
<th>Gravida</th>
<th>Severity of thrombocytopenia</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%age</td>
<td>No.</td>
<td>%age</td>
<td>No.</td>
</tr>
<tr>
<td>Primigravida</td>
<td>26</td>
<td>37.5%</td>
<td>38</td>
<td>50.7%</td>
<td>3</td>
</tr>
<tr>
<td>Second gravida</td>
<td>29</td>
<td>41.4%</td>
<td>24</td>
<td>32.0%</td>
<td>6</td>
</tr>
<tr>
<td>Multigravida</td>
<td>15</td>
<td>21.4%</td>
<td>13</td>
<td>17.3%</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>70</td>
<td>100%</td>
<td>75</td>
<td>100%</td>
<td>10</td>
</tr>
</tbody>
</table>

On comparison of gravida with severity of thrombocytopenia no significant difference was found between different grades of thrombocytopenia as the p-value is 0.295.
In the present study, 65.8% of subjects were in the age group of 30-35 years, 10.3% in the age group of 31-35 years, 2% were >35 years in age. On comparison of mode of delivery with severity of thrombocytopenia no significant difference was found between different grades of thrombocytopenia as the p-value is 0.96.

The mean age of the patients was 25±4 years in the present study. In a study by Suri V et al., the mean age was a little higher i.e. 27 years. Turgot A et al., Jaleel A et al., mean age of patient was 27.6±5.7 and 28.43 respectively.

In the present study, 43.2% of the subjects were primigravida followed by 38.1% second gravida and 18.7% multigravida. On comparison of gravida with severity of thrombocytopenia no significant difference was found between different grades of thrombocytopenia as the p-value is 0.96. On comparison of associated illness with severity of thrombocytopenia no significant difference was found between different grades of thrombocytopenia as the p-value is 0.177.

**DISCUSSION**

In the present study, 45.2% study subjects showed mild thrombocytopenia, 48.4% had moderate thrombocytopenia & 6.4% had severe thrombocytopenia. However, in the study by Borna S et al., Singh N et al mild thrombocytopenia was noted in 54% and 74.7% patients, moderate thrombocytopenia was seen in 30% and 17.9% of the patients and severe thrombocytopenia was seen in higher percentage of patients (16% and 7.4% respectively).

In the present study, 65.8% of subjects were in the age group of <25 years, 21.9% in the age group of 26-30 years, 10.3% in the age group of 31-35 years, 2% were >35 years in age. On comparison of age with severity of thrombocytopenia no significant difference was found between different grades of thrombocytopenia as the p-value is 0.12. In the study by Asrie F et al., most of the women were between 30-35 years. Singh S et al., in their study of Prevalence and Etiology of Thrombocytopenia in Pregnant Women reported that the most common age group was 21 to 25 years (47.8%), followed by 26 to 30 years (27.6%).

The mean age of the patients was 25±4 years in the present study. In a study by Suri V et al., the mean age was a little higher i.e. 27 years. Turgot A et al., Jaleel A et al., mean age of patient was 27.6±5.7 and 28.43 respectively.

In the present study, 43.2% of the subjects were primigravida followed by 38.1% second gravida and 18.7% multigravida. On comparison of gravida with severity of thrombocytopenia no significant difference was found between different grades of thrombocytopenia as the p-value is 0.96.

Asrie F et al., conducted a study in Ethiopia in 2014 which reported 35% of study group were primigravida and 65% were multigravida. These results are comparable with the study conducted by Sojitra M et al. on Maternal outcome in pregnancy with thrombocytopenia in 2020 in which 40% were primigravida and 60% women were multigravida as second gravida not taken separately in this study. Similar distribution of primigravida seen in study conducted by Brohi ZP et al., (40.8%) where as in the study conducted by Won YW et al., 51.6% of participants were primigravida which was higher than our study. The difference may be due to large family norm in our country.
In the present study, 7.7% of study subjects were in the gestational age of 37-39 weeks & 92.3% in the gestational age >39 weeks. On comparison of gestational age with severity of thrombocytopenia a significant difference was found between different grades of thrombocytopenia as the p-value is 0.0002.

In the study by Parnas M et al,[7] maximum patients 74.4% belonged to 37 to 40 weeks gestation. The mean gestational age in the present study was 37.08 years. was similar to studies conducted by Chauhan V et al[6] (38.6 ± 1.34weeks), Sojitra M et al,[18] (38 weeks) and Lin YH et al.[19] (39 weeks). Where as in the study by Bouzari Z et al.[20] the mean age was 35.83 ± 3.61 weeks which was lower than our study.

In the present study, 56.8% of study subject showed etiology of gestational thrombocytopenia. 15.5% had etiology of pre-eclampsia, 7.1% had HELLp syndrome, 6.4% had gestational hypertension, 3.2% had eclampsia & 2.6% had superimposed pre-eclampsia. In other etiologies, 1.9% had dengue, 3.2% had hypersplenism, 1.3% had DIC, 1.3% had ITP and only 0.7% had malaria as an etiology. On comparison of etiology with severity of thrombocytopenia no significant difference was found between different grades of thrombocytopenia as the p-value is 0.950.

In a study conducted by Wang X et al,[21] the incidence of gestational thrombocytopenia was 60%, hypertensive disorders were 28.2% and other causes including ITP making 11.8%. In a study conducted by Sainio et al,[22] gestational thrombocytopenia was 81%, pre-eclampsia was 16% and ITP was 3%.

In the present study, associated illness was anemia in 23.2% of subjects, 7.7% had hypothyroidism, 2.6% had chronic hypertension, 0.7% had liver disorders & 65.8% subjects had no associated illness. On comparison of associated illness with severity of thrombocytopenia no significant difference was found between different grades of thrombocytopenia as the p-value is 0.96.

In a study by Chauhan V et al,[23] anemia was associated in 7.6%, ITP in 3.1%, hypothyroidism in 1.5% and rest had no other medical illness.

In the present study, 51.6% subjects had normal vaginal delivery followed by LSCS in 48.4% of subjects. On comparison of mode of delivery with severity of thrombocytopenia no significant difference was found between different grades of thrombocytopenia as the p-value is 0.177.

Singh N et al.[8] (LSCS 36% and FTNVD 64%) and Vyas R et al.[24] (LSCS 37% and FTNVD 63%). Whereas the incidence of LSCS was higher in the studies conducted by Paefumi C et al.[25] (55%) and Yuce T et al (56%).[26]

In the present study, indication for LSCS was breech in 12% of subjects, CPD in 5.3%, DLOC with oligohydramnios in 2.7%, fetal distress in 8%, FIOL in 17.3%, IUGR in 2.7%, IUGR & oligohydramnios in 10.7%, only oligohydramnios in 9.4%, MSL with fetal distress in 4%, previous 2 LSCS in 4%, previous LSCS with fetal distress in 1.3%, previous LSCS with placenta accrete in 1.3%, previous LSCS with IUGR in 8%, previous LSCS with oligohydramnios in 4% & previous LSCS with scar tenderness in 9.4% of subjects.

In the present study, 56.8% study subjects had no requirement of blood/blood products transfusion compared to 43.2% subjects who required transfusion. On comparison of transfusion of blood/blood products with severity of thrombocytopenia no significant difference was found between different grades of thrombocytopenia as the p-value is 0.18.

However, the need for blood transfusion was higher in the studies by Parnas M et al.[7] (16.60%), Borna S et al.[13] (26.20%), Yuce T et al (10%).[26] In the present study, 65.8% subjects did not require antihypertensive treatment compared to 34.2% who required antihypertensive treatment. On comparison of requirement of antihypertensive treatment with severity of thrombocytopenia no significant difference was found between different grades of thrombocytopenia as the p-value is 0.72.

In the present study, low birth weight was seen in 73.1% of the subjects whereas 23.9% subjects had normal birth weight baby. On comparison of birth weight with severity of thrombocytopenia no significant difference was found between different grades of thrombocytopenia as the p-value is 0.88.

**CONCLUSION**

Gestational thrombocytopenia was found to be the most frequent cause of thrombocytopenia during pregnancy, although other underlying factors must also be taken into account. To rule out the majority of other causes, a thorough history and physical examination are required. To rule out pancytopenia and platelet clumping linked to pseudo-thrombocytopenia, a thorough analysis of the CBC and smear should be performed. The possibility of ITP should be raised by prior thrombocytopenia history.

**REFERENCES**