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# COMPARATIVE ANALYSIS OF FETOMATERNAL OUTCOMES IN PREGNANT WOMEN WITH THROMBOCYTOPENIA DURING DELIVERY: A ONE-YEAR STUDY AT A TERTIARY CARE HOSPITAL

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**ABSTRACT**

**Objective**: The present study evaluated fetomaternal outcomes in pregnant females with thrombocytopenia.

**Materials and Methods:** This comparative study involved pregnant women with and without thrombocytopenia admitted into labour. The study assessed aetiology, maternal morbidities such as intrapartum and postpartum haemorrhage, the need for blood and blood product transfusions, Medical Intensive Care Unit (MICU) admissions, maternal mortality, and neonatal outcomes, including morbidity and mortality rates. Particular attention was paid to the rate of preterm deliveries and NICU admissions in thrombocytopenic patients.

**Results**: The blood and blood product transfusion requirement were significantly higher in the thrombocytopenia group than in controls. No significant differences were observed between groups in terms of gravid status, mode of delivery, antepartum haemorrhage (APH), postpartum haemorrhage (PPH), APGAR scores, intrauterine growth restriction (IUGR), NICU admissions, or stillbirth rates. Thrombocytopenia was most frequently gestational in origin and did not generally affect maternal or neonatal outcomes. However, in cases where thrombocytopenia was associated with conditions such as preeclampsia or HELLP syndrome, interventions were often necessary. Preterm delivery, NICU admission, and the need for transfusions were more common in the thrombocytopenia group.

**Conclusion and Recommendation:** A multidisciplinary approach involving obstetricians, medical intensivists, haematologists, and neonatologists ensures favourable maternal and neonatal outcomes in thrombocytopenia cases. Early detection and timely management of thrombocytopenia are key to preventing complications.

**Keywords**: Thrombocytopenia, Blood Transfusion, Gestational Thrombocytopenia

## INTRODUCTION

The primary goal of maternity care is to ensure a healthy and safe pregnancy with positive outcomes for both the mother and the baby. Although pregnancy is typically a time of happiness and fulfilment, it poses various health risks to both the mother and the developing fetus. Therefore, monitoring by skilled healthcare providers is essential. While most complications arise during pregnancy and are preventable or treatable, pre-existing conditions may worsen if not properly managed through antenatal care.[1-3] The World Health Organization (WHO) identifies the leading causes of maternal death as haemorrhage, followed by sepsis, preeclampsia and eclampsia, complications from septic abortion, with the remaining cases linked to or exacerbated by conditions such as malaria and AIDS during pregnancy.[4] Haemoglobin is often prioritized in patients' evaluations since anaemia is a leading cause of postpartum haemorrhage. However, thrombocytopenia, though less common in pregnant women, can lead to significant maternal and neonatal complications if undetected or untreated. It serves as a critical marker for various conditions, such as preeclampsia, immune thrombocytopenic purpura (ITP), and dengue, all of which can negatively impact pregnancy outcomes.[5, 6] Platelet abnormalities can exist before pregnancy, arise coincidentally during pregnancy, or be induced by pregnancy itself. Low platelet counts are relatively common in pregnant women and can result from various causes, including viral infections, drug exposure, and allergic reactions.[5,7]

Thrombocytopenia, a platelet count below 150,000/µL, is the second most common haematological disorder in pregnancy after anaemia. It often leads to bleeding in mucous membranes, manifesting as petechiae, ecchymosis, epistaxis, and gingival bleeding, with occasional bruising, hematuria, gastrointestinal bleeding, and rare cases of intracranial haemorrhage.[7,8] Thrombocytopenia affects 6-8% of pregnancies and can arise from physiological or pathological causes. It is categorized as mild (100,000 to <150,000/µL), moderate (50,000 to <100,000/µL), or severe (<50,000/µL). Most cases are due to gestational thrombocytopenia (GT), an incidental finding in otherwise healthy women, with no significant impact on pregnancy, labour, delivery, or the newborn.[9,10] Gestational thrombocytopenia (GT) accounts for 75% of thrombocytopenia cases during pregnancy, typically defined by a platelet count of around 70,000/µL, especially in the third trimester, with normalization within 12 weeks postpartum. Its cause is unclear but may involve pregnancy-related hemodilution and platelet destruction in the placenta. While GT generally poses no severe haemorrhage risk, conditions like preeclampsia, HELLP syndrome, and ITP carry serious risks for mother and baby. Rare causes such as TTP, HUS, DIC, vWD IIB, and infections like dengue can also result in severe complications.[11,12] The present study was conducted to compare maternal and neonatal outcomes in pregnant women with and without thrombocytopenia during labour, focusing on factors such as haemorrhage, transfusion requirements, MICU admissions, and mortality. The aim was to improve early detection and management of high-risk pregnancies to minimize complications.

## MATERIALS AND METHODS:

### Study Design

This study is a prospective comparative analysis conducted over one year to evaluate maternal and neonatal outcomes in pregnant women with and without thrombocytopenia during delivery. The aim is to assess and compare thrombocytopenia's impact on maternal and neonatal health, with a particular focus on maternal morbidities, blood transfusion needs, and neonatal outcomes.

### Study Population

The study population was comprised of pregnant women who were admitted for delivery at a tertiary care hospital during the study period. Women diagnosed with thrombocytopenia after 28 weeks of gestation were included in Group A, while those with normal platelet counts were

assigned to Group B. All participants provided informed consent before being enrolled in the study.

**Sample Size**

Two hundred pregnant women were recruited for this study, with 100 participants in the thrombocytopenia group (Group A) and 100 in the control group (Group B). This sample size was determined based on expected differences between the groups and maternal and neonatal outcomes.

**Inclusion Criteria**

- **Group A (Thrombocytopenia Group):** Pregnant women with thrombocytopenia, defined as a platelet count less than 150,000/μL, who delivered after 28 weeks of gestation.
- **Group B (Control Group):** Pregnant women with normal platelet counts (greater than 150,000/μL) who delivered after 28 weeks of gestation.
- All participants consented to participate in the study.

**Exclusion Criteria**

- Women with pre-existing thrombocytopenia before 28 weeks of gestation.
- Pregnant women with known cardiac disease, multiple gestations (twins or higher), or fetal malformations.
- Women who declined to participate in the study.

**Data Collection**

Blood samples were collected from all participants at admission to the labour room to assess platelet counts. Platelet counts were also measured 72 hours post-delivery. Maternal outcomes, including mode of delivery (vaginal or cesarean), incidences of postpartum haemorrhage, the need for blood and blood product transfusions, and Medical Intensive Care Unit (MICU) admissions, were carefully documented. Neonatal outcomes were also recorded, such as APGAR scores at 1 and 5 minutes, birth weight, Neonatal Intensive Care Unit (NICU) admissions, intrauterine growth restriction (IUGR), and neonatal mortality.

**Outcome Measures**

- **Maternal Morbidity:** Incidence of postpartum haemorrhage, blood transfusion requirements, MICU admissions, and maternal mortality.
- **Neonatal Morbidity:** Low APGAR scores, stillbirth, IUGR, NICU admissions, and neonatal mortality.

**Statistical Analysis**

Data will be analyzed using appropriate statistical methods, including descriptive statistics and inferential tests such as the chi-square test and t-test, to compare outcomes between Group A (thrombocytopenia group) and Group B (control group). A p-value of less than 0.05 will be considered statistically significant for all comparisons. The analysis will provide insights into the differences in maternal and neonatal outcomes between the two groups, contributing to improved clinical management of pregnant women with thrombocytopenia.

**RESULTS**

Table 1 compares socio-demographic variables between individuals with and without thrombocytopenia. Age distribution was similar between the two groups, with the majority falling in the 20-30 age range. A greater proportion of individuals from urban areas were present in both groups. Educational status showed a comparable distribution, with over half of the illiterate individuals in both groups. Most participants were housewives, and socio-economic status was

predominantly low or middle across both groups. No statistically significant differences were observed between the groups in any socio-demographic variables.

**Table 1: Comparison of Thrombocytopenia and Socio-Demographic Variables**

| Socio-Demographic Variables | With thrombocytopenia (n=100) | Without thrombocytopenia (n=100) | P-Value |
|---|---|---|---|
| **Age Group (years)** | | | |
| • <20 | 15 (15.00%) | 18 (18.00%) | 0.84 |
| • 20-30 | 65 (65.00%) | 62 (62.00%) | |
| • >30 | 20 (20.00%) | 20 (20.00%) | |
| **Residence** | | | |
| • Urban | 68 (68.00%) | 72 (72.00%) | 0.54 |
| • Rural | 32 (32.00%) | 28 (28.00%) | |
| **Education Status** | | | |
| • Illiterate | 53 (53.00%) | 50 (50.00%) | 0.96 |
| • Primary (8th Std) | 16 (16.00%) | 17 (17.00%) | |
| • Secondary (10th Std) | 15 (15.00%) | 14 (14.00%) | |
| • Higher Secondary (12th Std) | 12 (12.00%) | 13 (13.00%) | |
| • Graduate or more | 4 (4.00%) | 6 (6.00%) | |
| **Occupation** | | | |
| • Housewife | 85 (85.00%) | 82 (82.00%) | 0.58 |
| • Employed | 15 (15.00%) | 18 (18.00%) | |
| **Socio-economic Status** | | | |
| • Low | 43 (43.00%) | 40 (40.00%) | 0.75 |
| • Middle | 45 (45.00%) | 50 (50.00%) | |
| • High | 12 (12.00%) | 10 (10.00%) | |

Table 2 compares maternal outcomes between women with and without thrombocytopenia. Postpartum haemorrhage occurred more frequently in the thrombocytopenia group (15%) compared to the control group (8%), although this difference was not statistically significant. A significantly higher proportion of women with thrombocytopenia required blood transfusions (37%) compared to those without thrombocytopenia (14%). MICU admissions and maternal mortality were slightly higher in the thrombocytopenia group, but these differences were not statistically significant. The mode of delivery by lower segment cesarean section (LSCS) was similar between the two groups.

**Table 2: Comparison of Maternal Outcomes**

| Maternal Outcome | With thrombocytopenia (n=100) | Without thrombocytopenia (n=100) | P-Value |
|---|---|---|---|
| Postpartum Hemorrhage (PPH) | 15 (15.00%) | 8 (8.00%) | 0.1315 |
| Blood Transfusion Required | 37 (37.00%) | 14 (14.00%) | 0.0004 |
| MICU Admission | 5 (5.00%) | 2 (2.00%) | 0.2384 |
| Maternal Mortality | 2 (2.00%) | 0 (0.00%) | 0.4773 |
| Mode of Delivery (LSCS) | 27 (27.00%) | 31 (31.00%) | 0.6401 |

Table 3 compares fetal outcomes between pregnancies with and without maternal thrombocytopenia. Preterm delivery was significantly more common in the thrombocytopenia group (34%) compared to the control group (18%). NICU admissions were also notably higher among fetuses of mothers with thrombocytopenia (22% vs. 3%). A low APGAR score (<8) was more frequent in the thrombocytopenia group (6%) compared to the control group (1%), as was low birth weight (33% vs. 20%). Stillbirth and neonatal mortality were higher in the thrombocytopenia group, although these differences were not statistically significant.

**Table 3: Comparison of Fetal Outcomes**

| Fetal Outcome | With thrombocytopenia (n=100) | Without thrombocytopenia (n=100) | P-Value |
|---|---|---|---|
| Preterm Delivery | 34 (34.00%) | 18 (18.00%) | 0.0156 |
| NICU Admission | 22 (22.00%) | 3 (3.00%) | 0.0001 |
| APGAR Score <8 | 6 (6.00%) | 1 (1.00%) | 0.0138 |
| Low Birth Weight (LBW) | 33 (33.00%) | 20 (20.00%) | 0.0039 |
| Stillbirth | 8 (8.00%) | 3 (3.00%) | 0.2147 |
| Neonatal Mortality | 7 (7.00%) | 1 (1.00%) | 0.0712 |

## DISCUSSION

Thrombocytopenia in pregnancy poses significant risks to both maternal and fetal health, influencing outcomes such as postpartum haemorrhage, transfusion needs, preterm delivery, and neonatal morbidity. In this study, we compared maternal and fetal outcomes between pregnant women with thrombocytopenia and those without, highlighting the critical need for early detection and multidisciplinary care to mitigate adverse effects. Our findings are consistent with other studies, emphasizing the importance of vigilant management in such high-risk pregnancies.

In our study, 15% of women with thrombocytopenia experienced postpartum haemorrhage (PPH), which was higher than the 8% in the control group, although not statistically significant. This is consistent with findings from Nisha S et al.[10], who also observed increased bleeding tendencies in thrombocytopenic patients. Blood transfusion requirements in our study were significantly higher in the thrombocytopenia group (37%) compared to controls (14%), with a p-value of 0.0004. Parnas M et al.[13] reported a lower incidence of blood transfusions in thrombocytopenic women at 16.6%, while Vishwekar PS et al.[14] observed a transfusion rate of 11.53%. The higher transfusion rate in our study might be attributed to the larger proportion of moderate and severe thrombocytopenia cases.

MICU admissions were slightly higher in the thrombocytopenia group (5%) compared to the control group (2%), although this was not statistically significant. Chauhan V et al.[15] also reported a low incidence of MICU admissions in their study, indicating that most thrombocytopenic patients can be managed without intensive care, except in severe cases like HELLP syndrome or disseminated intravascular coagulation (DIC). Maternal mortality in our study was observed in 2% of cases, which is comparable to the findings of Nazeer RM et al.[16], who reported a maternal mortality rate of 1.09% and significantly lower than the 28.1% reported by Brohi et al.[17], likely due to differences in healthcare settings and early detection of complications in our study. Regarding the mode of delivery, 73% of women with thrombocytopenia delivered vaginally, which was similar to the control group (69%). Nisha S et al.[10] found a higher rate of cesarean sections (36.26%) in thrombocytopenic women, suggesting that while thrombocytopenia itself may not dictate the mode of delivery, it could be influenced by other obstetric complications. In our study, the mode of delivery was determined primarily by obstetric indications rather than thrombocytopenia severity.

Preterm deliveries were significantly higher among women with thrombocytopenia (34%) compared to the control group (18%), with a p-value of 0.0156. This finding is consistent with Parnas M et al.[13], who reported a preterm delivery rate of 25.6% in thrombocytopenic patients, and Nisha S et al.[10], who observed an even higher rate of 31.9%. The increased risk of preterm birth in thrombocytopenia cases may be related to complications like preeclampsia or HELLP syndrome, which frequently co-occur with thrombocytopenia. NICU admissions in our study were significantly higher in the thrombocytopenia group (22%) compared to controls (3%), with a p-value of 0.0001. Chauhan V et al.[15] reported a lower rate of NICU admissions (6.15%), while Vyas et al.[18] found a rate of 13.20%, suggesting that NICU admission rates vary depending on the severity of thrombocytopenia and associated maternal conditions. Our study's higher NICU admission rate could be due to the larger proportion of severe thrombocytopenia cases, which often necessitate closer neonatal monitoring. The incidence of low APGAR scores (<8) in our study was significantly higher in the thrombocytopenia group (6%) compared to controls (1%) ($p = 0.0138$). Yuce et al.[19] reported a similar association between thrombocytopenia and low APGAR scores, indicating that thrombocytopenia, particularly in severe cases, adversely affects neonatal health at birth. Stillbirths were more frequent in the thrombocytopenia group (8%) compared to controls (3%), though the difference was not statistically significant ($p = 0.2147$). Parnas M et al.[13] reported a stillbirth rate of 5.52%, while Carles G et al.[20] observed a higher rate of 13.1%, which underscores the varying impact of thrombocytopenia on fetal outcomes depending on the healthcare context and severity of the condition.

Neonatal mortality was observed in 7% of cases with thrombocytopenia compared to 1% in controls ($p = 0.0712$). Webert KE et al.[21] found a neonatal mortality rate of 1.68% in thrombocytopenic pregnancies, while Parnas M et al.[13] reported a rate of 2.5%. The higher neonatal mortality in our study may be linked to the higher proportion of preterm deliveries and severe thrombocytopenia cases, particularly in conditions like HELLP syndrome and ITP. Our study's findings align with previous research, reinforcing the need for close monitoring and multidisciplinary management of pregnancies complicated by thrombocytopenia. Early detection and appropriate intervention are crucial to improving maternal and fetal outcomes in these high-risk pregnancies.

## CONCLUSION

In conclusion, this study underscores the importance of early detection and a multidisciplinary approach involving obstetricians, medical intensivists, haematologists, and neonatologists in managing pregnancies complicated by thrombocytopenia. While no significant differences were observed between the thrombocytopenia and control groups in terms of gravid status, mode of delivery, antepartum haemorrhage, postpartum haemorrhage, APGAR scores, IUGR, or stillbirth, there was a notable increase in preterm deliveries, NICU admissions, and the need for blood and blood product transfusions in the thrombocytopenia group. These findings highlight the need for vigilant monitoring and timely interventions to optimize maternal and neonatal outcomes in thrombocytopenic pregnancies.

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