

Etiological Spectrum, Severity, and Maternal Outcomes of Thrombocytopenia in Pregnancy: A Prospective Observational Study

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Abstract: ***Background:** Thrombocytopenia is the second most common hematological abnormality encountered during pregnancy after anemia. Although gestational thrombocytopenia is usually mild and associated with favorable outcomes, thrombocytopenia may also accompany hypertensive disorders of pregnancy and other pathological conditions with potentially significant maternal consequences. **Objective:** To evaluate the etiological spectrum and severity of thrombocytopenia in pregnancy and assess maternal and obstetric outcomes, including delivery characteristics, maternal complications, and blood component requirements. **Methods:** A prospective observational study was conducted in the Department of Obstetrics and Gynaecology, National Institute of Medical Sciences & Research, NIMS University Rajasthan, Jaipur, Rajasthan, India, from January 2025 to June 2026. Antenatal women with platelet count <150,000/ μ L, gestational age >28 weeks, and willingness to participate were included. Women with known diabetes mellitus, collagen disorders, tuberculosis, epilepsy, previous bad obstetric history, or history of splenectomy were excluded. The calculated sample size was 88; 79 women were ultimately analyzed using purposive sampling. Data were collected prospectively until delivery and the immediate postpartum period. Statistical analysis was performed using IBM SPSS Statistics; $p < 0.05$ was considered statistically significant. **Results:** Among 79 women, mean maternal age was 25.85 ± 3.817 years and mean gestational age at diagnosis was 34.42 ± 3.604 weeks. Mild thrombocytopenia predominated (56, 70.9%), followed by moderate (14, 17.7%) and severe (9, 11.4%). Gestational thrombocytopenia was the commonest reported etiology (48, 60.8%). The reported association between etiology and severity was significant ($p = 0.001$), and hypertensive disease increased with increasing thrombocytopenia severity ($p = 0.002$). Term delivery occurred in 65 (82.28%) women and vaginal delivery in 65 (82.28%). PPH occurred in 5 (6.33%), haematoma in 4 (5.06%), placental abruption and ARDS in 3 (3.80%) each. PRBC/whole blood and FFP were each required in 5 (6.33%); no RDP transfusion was recorded. **Conclusion:** Gestational thrombocytopenia predominated and was mainly mild. Hypertensive disorders were increasingly represented among moderate and severe thrombocytopenia. Most women had favorable obstetric outcomes, although a minority experienced maternal complications and required blood component support.*

Keywords: thrombocytopenia, pregnancy, gestational thrombocytopenia, hypertensive disorders of pregnancy, maternal outcome, postpartum haemorrhage, blood transfusion

1. Introduction

Thrombocytopenia, defined as a platelet count below 150,000/ μ L, is the second most common hematological abnormality encountered during pregnancy after anemia. It may represent benign gestational thrombocytopenia or occur secondary to hypertensive disorders, immune-mediated disease, infection, disseminated intravascular coagulation, or thrombotic microangiopathies.

Gestational thrombocytopenia is generally detected during later pregnancy and is usually mild and associated with favorable maternal and neonatal outcomes. In contrast, thrombocytopenia accompanying hypertensive disorders may indicate more significant disease and requires closer surveillance.

The present study evaluated the distribution and severity of thrombocytopenia and assessed maternal and obstetric outcomes in women presenting to a tertiary-care obstetric center.

2. Aim and Objectives

To evaluate the etiological spectrum and severity of thrombocytopenia in pregnancy and assess maternal and obstetric outcomes.

- 1) To determine the frequency and severity of thrombocytopenia among pregnant women.
- 2) To identify the etiological spectrum of thrombocytopenia.
- 3) To evaluate the association between thrombocytopenia severity and underlying etiology.
- 4) To assess gestational age at delivery and mode of delivery.
- 5) To determine maternal complications including postpartum haemorrhage, haematoma, placental abruption, pulmonary oedema, and adult respiratory distress syndrome.
- 6) To assess the requirement for PRBC/whole blood, FFP, and RDP.

3. Materials and Methods

3.1 Study Design and Setting

This prospective observational study was conducted in the Department of Obstetrics and Gynaecology, National Institute of Medical Sciences & Research, NIMS University Rajasthan, Jaipur, Rajasthan, India, from January 2025 to June 2026, following institutional ethical approval.

3.2 Study Population

Pregnant women attending antenatal and obstetric services were screened for thrombocytopenia. Eligible women were enrolled prospectively and followed until delivery and the immediate postpartum period.

3.3 Inclusion Criteria

- Platelet count $<150,000/\mu\text{L}$.
- Gestational age >28 weeks.
- Willingness to participate.
- Availability for follow-up until delivery.

3.4 Exclusion Criteria

- Known diabetes mellitus.
- Collagen disorders.
- Tuberculosis.
- Epilepsy.
- Previous bad obstetric history.
- History of splenectomy.

3.5 Sample Size and Sampling

The calculated sample size was 88, based on $Z=1.96$, assumed prevalence of 8%, and margin of error of 6%. Seventy-nine women were ultimately analyzed. Purposive sampling was used.

3.6 Data Collection

Baseline evaluation included complete hemogram with platelet count, blood group/Rh typing, ultrasonography, DIPSI testing, urine examination, HIV, VDRL and HBsAg screening. Selected women underwent PT, APTT, FDP, fibrinogen, renal and liver function testing and other clinically indicated investigations. Women were followed until delivery.

3.7 Classification of Thrombocytopenia

Mild, moderate, and severe thrombocytopenia were classified according to the original thesis protocol. The exact platelet-count cut-offs should be inserted from the source thesis before journal submission if they are not already documented in the study protocol.

3.8 Statistical Analysis

Continuous variables were expressed as mean $\pm$ SD and categorical variables as frequencies and percentages. Independent t-test and chi-square test were used as described

in the original thesis. A p-value <0.05 was considered statistically significant.

3.9 Ethics

Written informed consent was obtained from all participants.

4. Results

A total of 79 women with thrombocytopenia during pregnancy were analyzed. Mean maternal age was 25.85 ± 3.817 years; 51.90% were aged 20–25 years. Rural women comprised 63.29% and 64.6% were booked cases. Mean gestational age at diagnosis was 34.42 ± 3.604 weeks, with 44.30% diagnosed at 37–40 weeks.

Table 1: Severity distribution of thrombocytopenia

Severity	n (%)
Mild	56 (70.9%)
Moderate	14 (17.7%)
Severe	9 (11.4%)
Total	79 (100%)

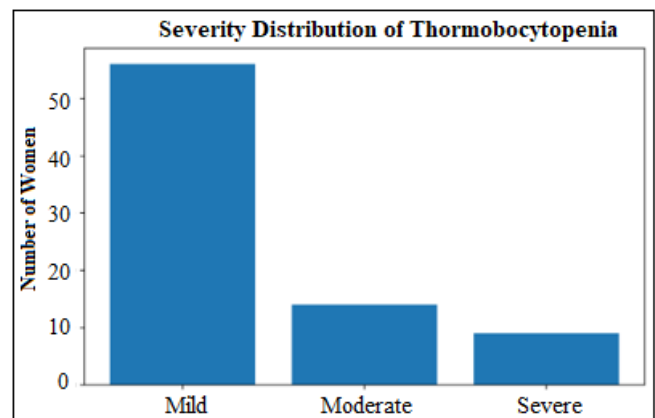


Figure 1: Severity distribution of thrombocytopenia.

Table 2: Reported etiological categories

Reported etiological category	n (%)
Gestational thrombocytopenia	48 (60.8%)
HDP/gestational hypertension	20 (25.3%)
Pre-eclampsia	3 (3.8%)
Severe pre-eclampsia	2 (2.5%)
Eclampsia	0
Immune thrombocytopenia	0

Data reconciliation note: the reported etiological categories above account for 73 of 79 women. The remaining 6 women must be identified from the source thesis/database before journal submission; they have not been assigned an invented diagnosis in this manuscript. The reported HDP components ($20 + 3 + 2$) equal 25/79 (31.6%) when treated as one composite HDP category.

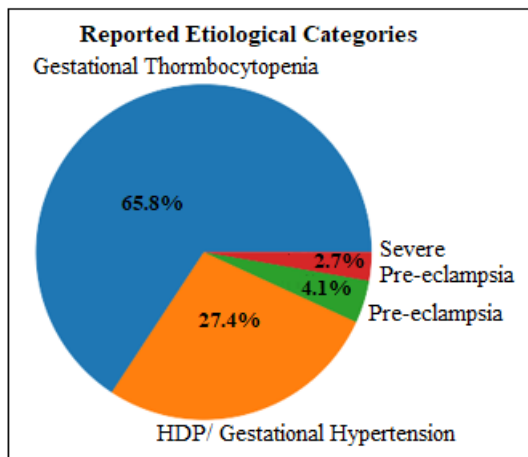


Figure 2: Pie chart of the reported etiological categories; six participants remain to be reconciled from the source dataset.

Table 3: Obstetric outcomes

Obstetric outcome	n (%)
Preterm delivery	13 (16.46%)
Term delivery	65 (82.28%)
Post-term delivery	1 (1.27%)
Vaginal delivery	65 (82.28%)
LSCS	14 (17.72%)
Spontaneous labour	56 (70.89%)
Previous 1 LSCS	13 (16.46%)
Previous 2 LSCS	1 (1.27%)

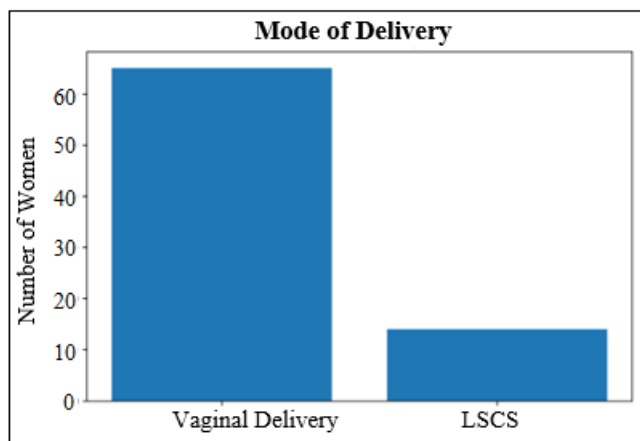


Figure 3: Mode of Delivery

Table 4: Maternal complications

Maternal complication	n (%)
Postpartum haemorrhage	5 (6.33%)
Haematoma	4 (5.06%)
Placental abruption	3 (3.80%)
Pulmonary oedema	1 (1.27%)
Adult respiratory distress syndrome	3 (3.80%)

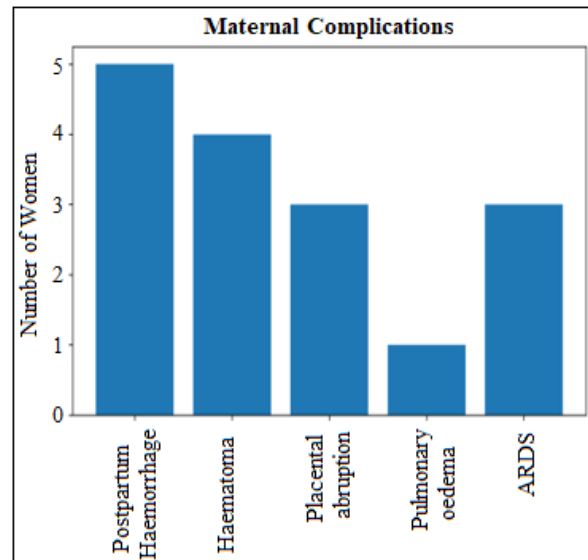


Figure 4: Maternal complications

Table 5: Blood component requirement

Blood component	n (%)
PRBC/whole blood	5 (6.33%)
FFP	5 (6.33%)
RDP	0

All 14 LSCS procedures were for previous caesarean delivery; no LSCS was recorded as being performed primarily because of thrombocytopenia. Maternal complications were not necessarily mutually exclusive.

5. Discussion

The principal finding was the predominance of mild thrombocytopenia, with gestational thrombocytopenia representing the largest reported etiological category. This pattern is consistent with previous literature in which gestational thrombocytopenia is generally the leading cause of thrombocytopenia during pregnancy.

The present study demonstrated a significant association between etiology and thrombocytopenia severity. Gestational thrombocytopenia was associated predominantly with mild disease, whereas hypertensive disorders were increasingly represented among moderate and severe cases. This supports the clinical importance of evaluating the underlying cause rather than interpreting platelet count in isolation.

Maternal outcomes were generally favorable: 82.28% delivered at term and 82.28% had vaginal delivery. All LSCS procedures were attributed to previous caesarean delivery, suggesting that thrombocytopenia itself was not the principal indication for operative delivery in this cohort.

Postpartum haemorrhage was the most frequent maternal complication, followed by haematoma and placental abruption. PRBC/whole blood and FFP were each used in 6.33%, while no RDP transfusion was recorded. The relatively low transfusion burden may reflect the predominance of mild thrombocytopenia.

The study is limited by its single-center design, small analyzed cohort, unequal severity groups, absence of a normal-platelet control group, limited advanced etiological work-up, purposive sampling, and lack of long-term follow-up. The calculated sample size was 88, whereas 79 participants were analyzed.

6. Conclusion

Gestational thrombocytopenia was the predominant reported cause and mild thrombocytopenia the predominant severity category. Hypertensive disorders were increasingly represented in moderate and severe thrombocytopenia. Most women delivered at term and vaginally, with relatively low frequencies of maternal complications and transfusion. Careful etiological assessment and closer surveillance are particularly important when platelet counts fall into the moderate or severe range.

Declarations

- **Ethics approval:** Institutional Ethics Committee approval was obtained.
- **Consent:** Written informed consent was obtained from all participants.
- **Funding:** No external funding was required for this study.
- **Conflict of interest:** No conflict of interest.
- **Data availability:** Completed according to the manual and software documentation maintained as per protocol of the Institute and Hospital.
- **Author contributions:** Dr. Dhruv Shah, Dr Disha Gupta contributed to study conception, patient recruitment, clinical data collection, and manuscript preparation. Dr. Muskan Chaudhary contributed to study design, interpretation of transfusion-related findings, critical revision, and final approval.

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