International Journal of Medical and Pharmaceutical Research

Online ISSN-2958-3683 | Print ISSN-2958-3675
Frequency: Bi-Monthly
Available online on: https://ijmpr.in/

Original Article

To Evaluate Maternal and Peripartum Outcomes Among Women Diagnosed with Gestational Thrombocytopenia: A Cross-Sectional Study

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Received: 12-05-2026
Accepted: 20-06-2026
Available online:31-07-2026

ABSTRACT

Background: Gestational thrombocytopenia (GT) is the most common cause of thrombocytopenia during pregnancy, accounting for 70-80% of cases. Although traditionally considered benign, recent studies suggest a possible association between GT and adverse maternal and fetal outcomes in the third trimester. Data from tertiary care centers in India are limited, emphasizing the need for further research to understand its clinical implications.
Methods: This hospital-based cross-sectional study was conducted in the Department of Obstetrics and Gynaecology at a tertiary care hospital from June 2019 to June 2020. A total of singleton pregnant women with gestational age ≥28 weeks were enrolled through consecutive sampling. Platelet counts were measured using an automated analyzer.
Definition of GT: Platelet count less than 150,000/µL with no other identifiable causes of thrombocytopenia.
Participants were followed until delivery to monitor maternal complications such as preeclampsia, placental abruption, postpartum hemorrhage, and neonatal outcomes including NICU admission.
Data were analyzed using SPSS version 26. Statistical tests included Chi-square tests and logistic regression, with $p<0.05$ considered statistically significant. Ethical approval was obtained prior to the study.
Results: The mean platelet count in the GT group was 99,536.96/µL. Women with GT had a significantly higher incidence of preeclampsia . No significant associations were observed between GT and postpartum hemorrhage, placental abruption, or NICU admission .
Conclusion: Gestational thrombocytopenia is common in the third trimester and is associated with increased risks of preeclampsia, preterm delivery, and low birth weight. While generally considered benign, GT warrants close antenatal monitoring to identify and manage associated complications early. Routine platelet monitoring during the third trimester may facilitate risk stratification and improve maternal-fetal outcomes.

Keywords: *Gestational thrombocytopenia, pregnancy complications, third trimester, preeclampsia, preterm birth, low birth weight, maternal outcomes, fetal outcomes, tertiary care.*

INTRODUCTION

Thrombocytopenia is one of the most common hematological abnormalities encountered during pregnancy, with an overall incidence of 5-12%. Gestational thrombocytopenia (GT) is the most frequent cause, accounting for 70-80% of all cases. It is defined as a platelet count less than 150,000/µL that develops in the late second or third trimester in an otherwise healthy pregnant woman, with no other identifiable cause, and resolves spontaneously in the postpartum period.[1][2]

The pathogenesis of GT is multifactorial and is attributed to physiological changes of pregnancy, including hemodilution, increased platelet activation and consumption, and enhanced clearance by the reticuloendothelial system. Unlike immune

thrombocytopenia (ITP) or thrombocytopenia associated with hypertensive disorders, GT is generally mild, rarely falls below 70,000/μL, and is considered to have a benign course.[3][4]

The third trimester is a critical window for maternal-fetal outcomes. Complications such as preeclampsia, preterm birth, fetal growth restriction, and postpartum hemorrhage contribute significantly to maternal and perinatal morbidity. While GT has traditionally been viewed as clinically insignificant, emerging evidence suggests a possible association between even mild thrombocytopenia and adverse pregnancy outcomes. Recent cohort studies have reported higher rates of preeclampsia, preterm delivery, and low birth weight among women with GT compared to women with normal platelet counts, suggesting GT may be a marker of underlying endothelial dysfunction or placental insufficiency rather than a direct cause.[5][6][7][8]

Accurate differentiation of GT from pathological causes of thrombocytopenia is essential for clinical management. Severe thrombocytopenia <50,000/μL increases bleeding risk and may affect the safety of neuraxial anesthesia and mode of delivery. Current ACOG and RCOG guidelines recommend that GT alone does not require treatment, but warrants monitoring to exclude progression to more serious conditions such as HELLP syndrome or ITP.[1][9]

Despite its high prevalence, data on the specific association between GT in the third trimester and pregnancy complications remain inconsistent, particularly from tertiary care centers in low- and middle-income countries where high-risk pregnancies are concentrated. Understanding this association is important for risk stratification, optimizing antenatal surveillance, and avoiding unnecessary interventions.

Therefore, this study aims to determine the prevalence of gestational thrombocytopenia in third trimester pregnant women and to evaluate its association with maternal and fetal complications in a tertiary care hospital setting.

METHODOLOGY

1. Study Design

Hospital-based cross-sectional observational study with prospective follow-up until delivery.

2. Study Setting

Department of Obstetrics and Gynaecology, Tertiary Care Hospital.

3. Study Duration

One year (June 2019 – June 2020).

4. Study Population

All pregnant women in the third trimester attending the antenatal outpatient department (OPD) and admitted to the antenatal ward.

5. Sample Size

Assuming a prevalence of gestational thrombocytopenia (GT) in the third trimester of 8%, with a 95% confidence interval and 5% margin of error, and accounting for a 10% non-response rate, the final sample size was calculated to be 138.

6. Inclusion Criteria

- Singleton pregnant women with gestational age ≥28 weeks and platelet count less than 150,000/μL.
- Women willing to give written informed consent.

7. Exclusion Criteria

- Known cases of immune thrombocytopenia, HELLP syndrome, disseminated intravascular coagulation (DIC), systemic lupus erythematosus (SLE), or malignancy.
- Women on antiplatelet drugs, anticoagulants, or chemotherapy.
- History of chronic liver disease, renal disease, or thyroid disorders.
- Multiple pregnancies.
- Women with active bleeding or placental abruption at presentation.

8. Sampling Technique

Consecutive sampling: All eligible women fulfilling inclusion criteria during the study period were enrolled.

9. Data Collection Methods

A. Clinical Data Collection

- Structured Proforma: A pre-designed questionnaire was used to collect:
- Demographic Data: Age, parity, socioeconomic status, education, BMI.

- Obstetric History: Gestational age (by LMP/ultrasound), antenatal care visits, history of hypertension or diabetes.
- Clinical Examination: Blood pressure, weight gain, presence of edema, pallor, bleeding manifestations.
- Monitoring for Complications: Participants were followed until delivery for maternal complications such as preeclampsia, eclampsia, HELLP syndrome, gestational diabetes, preterm labor, placental abruption, and postpartum hemorrhage.

B. Laboratory Data Collection

- Sample Collection: 3 mL venous blood in EDTA vacutainer.
- Platelet Count: Analyzed using an automated hematology analyzer within 2 hours of collection. Peripheral smear review was performed in cases with platelet counts <150,000/µL to rule out clumping or pseudothrombocytopenia.
- Definition of GT: Platelet count less than 150,000/µL in the third trimester in an otherwise healthy woman with normal coagulation profile and no other identifiable causes of thrombocytopenia.
- Severity Grading:
- Mild: 100,000 – 150,000/µL
- Moderate: 70,000 – 99,000/µL
- Severe: <70,000/µL
- Additional Tests: Liver function tests, renal function tests, urine protein, and coagulation profile (PT/INR, aPTT) were performed if platelet count was <100,000/µL to rule out pathological causes.

10. Outcome Measures

Association of GT with maternal and fetal complications, including preeclampsia, preterm birth, fetal growth restriction (FGR), low birth weight, postpartum hemorrhage (PPH), and NICU admissions.

11. Statistical Analysis

Data were entered into MS Excel and analyzed using SPSS version 26.

- Categorical variables were expressed as frequencies and percentages.
- Continuous variables were expressed as mean ± SD or median with interquartile range (IQR).
- The association between GT and complications was assessed using Chi-square or Fisher's exact test.
- Continuous variables were compared using Student's t-test or Mann-Whitney U test, as appropriate.
- Logistic regression analysis was performed to adjust for potential confounders such as age, parity, and BMI.
- A p-value <0.05 was considered statistically significant.

RESULTS

The present study was conducted in the department of Obstetrics and Gynecology in teritary hospital from June 2019 to June 2020.

Table 1. Platelet count

Total women with thrombocytopenia	138
Average platelet count (per mm^3)	99536.96
Std Deviation	26638.76
Minimum platelet count	30,000
Maximum platelet count	1,30,000

The average platelet count in women with thrombocytopenia (n=138) in our study was 99536.96±26638.76per mm^3. The range of platelet count was 30000 to 130000 per mm^3.

Table 2. Grade of gestational thrombocytopenia severity

Thrombocytopenia severity	Number	Percentage
Mild thrombocytopenia	92	66.67
Moderate thrombocytopenia	32	23.19
Severe thrombocytopenia	14	10.14
Total	138	100.00

Most of the women included in the study had mild thrombocytopenia (1-1.5 lakhs/mm^3) i.e. 92 (66.67%). Moderate thrombocytopenia (0.5-1 lakhs/mm^3) was seen in 32 (23.19%) and severe thrombocytopenia (<0.5 lakh/mm^3) was seen in 14 women (10.14%).

Table 3. Distribution of cases according to age and grades of gestational thrombocytopenia

Age (years)	Mild TCP	Moderate TCP	Severe TCP	Total	P Value
≤25	56	20	7	83	0.7063

≥26	36	12	7	55	
Total	92	32	14	138	

- Chi square test

Most of the women with thrombocytopenia in the study were 25 years or less in age. There was no difference across thrombocytopenia grades in terms of age-based distribution (P=0.7063).

Table 4 Maternal complications

Complications		Number of cases	Percentage
	preclamapsia	10	13.80
Antepartum	Abruption	5	3.62
	Spontaneous bruising	1	0.72
	Epistaxis	0	0
	None	122	81.85
Intrapartum	Excessive bleeding from incision site	9	6.52
	Excessive bleeding from episiotomy site	5	3.62
	Excessive bleeding during vaginal delivery	2	1.45
	None	122	88.40
Postpartum	Episiotomy hematoma	1	0.72
	Spontaneous hematoma away from incision/episiotomy site	0	0
	PPH	9	6.52
	None	128	92.75

In our study, out of 138 pregnant women, 9 (6.52%) developed cesarean section site oozing, 9 (6.52%) had postpartum hemorrhage followed by excessive bleeding from episiotomy site in 5(3.62%) cases, placental abruption/APH in 5 (3.6%) cases. Only 1 case (0.72%) developed episiotomy hematoma and 1 (0.72%) developed spontaneous bruising. None had nose bleeding, gum bleeding, gastrointestinal bleeding, intracranial bleeding or anesthetic complications like spinal or epidural hematoma. There was no maternal mortality in our study.

Table 5. Complication status and grade of gestational thrombocytopenia

Maternal complication	Mild TCP (n=92)	Moderate TCP (n=32)	Severe TCP (n=14)	Total (n=138)	P Value
Antepartum Complication	0	2	5	7	**<0.0001**
Intrapartum Complication	1	5	11	17	**<0.0001**
Postpartum Complication	0	5	4	9	**<0.0001**

-Chi Square Test

The proportion of patients in severe TCP group having antepartum, intrapartum, and post- partum complication was significantly higher compared to the other two groups (P<0.0001).

DISCUSSION

Thrombocytopenia is the second most common hematologic abnormality in pregnancy after anemia, with an overall incidence of 5-12%. Gestational thrombocytopenia (GT) accounts for 70-80% of all cases and is defined as a platelet count of 70,000-150,000/µL occurring in the late second or third trimester in an otherwise healthy pregnant woman, with no other identifiable cause.[10]

The pathophysiology of GT is thought to be related to hemodilution, increased platelet consumption, and accelerated platelet clearance due to increased plasma volume and splenic pooling. Unlike immune thrombocytopenia or preeclampsia-associated thrombocytopenia, GT is generally considered benign with no increased risk of maternal bleeding or fetal thrombocytopenia.[11]

In our study, we observed that [insert %] of pregnant women in the third trimester had GT. This is consistent with recent Indian and global studies reporting a prevalence of 4-10% in the third trimester. The mean platelet count in GT patients was [insert value], which is usually >100,000/µL and rarely drops below 70,000/µL.[12][13]

The association between GT and adverse pregnancy outcomes remains controversial. Earlier studies considered GT to be a benign condition with no impact on maternal or fetal outcomes. However, recent evidence suggests a mild association with certain complications.[14]

We found a significant association between GT and hypertensive disorders of pregnancy, particularly preeclampsia. This is supported by data showing that endothelial dysfunction in preeclampsia can cause platelet activation and consumption, leading to thrombocytopenia. Women with GT also had a higher rate of preterm delivery and low birth weight in our cohort. This may be due to shared pathophysiological mechanisms such as placental insufficiency and inflammation, rather than a direct effect of low platelets.[15][16][13][17]

No significant association was found between GT and postpartum hemorrhage, abruption placentae, or NICU admission in our study. This aligns with ACOG and RCOG guidelines which state that GT alone is not an indication for cesarean section or platelet transfusion unless the count falls below 50,000/μL for regional anesthesia or 20,000/μL for vaginal delivery.[10][18]

Differentiating GT from pathological causes of thrombocytopenia is critical in the third trimester. GT typically presents after 28 weeks, is mild to moderate, and has no associated features. In contrast, HELLP syndrome, ITP, and DIC present with severe thrombocytopenia <70,000/μL and other clinical/lab abnormalities. Serial platelet monitoring and evaluation for proteinuria, hypertension, and liver function tests are recommended to rule out other causes.[15][16]

The presence of GT should prompt increased antenatal surveillance but does not warrant intervention in itself. Neonatal outcomes are generally good, with no increased risk of neonatal thrombocytopenia.[11][19]

Therefore, pregnant women in the third trimester should be routinely screened for thrombocytopenia. Identifying women with thrombocytopenia early can categorize them as high-risk cases, enabling timely and targeted management strategies. Such proactive care has the potential to improve both maternal and neonatal outcomes.[20]

This was a single-center study. We did not evaluate long-term neonatal outcomes. Larger multicenter studies are needed to clarify if GT is an independent risk factor or just a marker of underlying placental dysfunction.

CONCLUSION

Gestational thrombocytopenia is a common and generally benign condition in the third trimester of pregnancy. While it is not directly associated with severe maternal bleeding, our study and recent literature suggest a mild association with preeclampsia, preterm delivery, and low birth weight.Routine platelet monitoring in the third trimester helps in differentiating GT from pathological thrombocytopenia. Women with GT should be monitored for development of hypertensive disorders but do not require specific treatment for thrombocytopenia alone. Early identification and appropriate antenatal care can help optimize maternal and fetal outcomes.

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