Biological and Clinical Sciences Research Journal
eISSN: 2708-2261; pISSN: 2958-4728
www.bcsrj.com
DOI: https://doi.org/10.54112/bcsrj.v6i4.2227
*Biol. Clin. Sci. Res. J., Volume 6(4), **2025**: 2227*
Original Research Article

Fetomaternal Outcomes in Pregnant Women with Gestational Thrombocytopenia

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(Received, 4th March 2025, Accepted 15th April 2025, Published 30th April 2025)

Abstract: *Gestational thrombocytopenia is the most common cause of thrombocytopenia during pregnancy and is generally considered a benign condition. However, its association with adverse maternal and neonatal outcomes remains clinically relevant, particularly in low- and middle-income settings where local evidence is limited. This study aimed to determine fetomaternal outcomes in pregnant women with gestational thrombocytopenia at a tertiary care hospital in Multan.* ***Objective:*** *To determine the fetomaternal outcomes in pregnant women with gestational thrombocytopenia.* ***Methods:*** *This descriptive study was conducted in the Department of Obstetrics and Gynaecology, Ibn-e-Siena Hospital, Multan, from February 2024 to February 2025. A total of 176 pregnant women aged 18–45 years with gestational thrombocytopenia were enrolled through non-probability consecutive sampling. Women with hypertensive disorders of pregnancy, disseminated intravascular coagulation, systemic lupus erythematosus, chronic liver disease, thrombotic thrombocytopenia, and other major secondary causes were excluded. Participants were followed until delivery. Maternal outcomes included gestational age at delivery, antepartum hemorrhage, postpartum hemorrhage, mode of delivery, and stillbirth. Live-born neonates underwent complete blood count testing within 24 hours to assess neonatal thrombocytopenia. Data were analyzed using SPSS version 23, and post-stratification comparisons were performed using the chi-square test with p≤0.05 considered statistically significant.* ***Results:*** *The mean maternal age was 28.94 ± 5.63 years and the mean gravida was 2.71 ± 1.36. Most women were aged 26–35 years (51.7%) and were multigravida (70.5%). The mean gestational age at delivery was 37.61 ± 1.84 weeks. Preterm delivery occurred in 19.3% of cases, antepartum hemorrhage in 6.3%, postpartum hemorrhage in 9.1%, cesarean delivery in 55.1%, stillbirth in 4.5%, and neonatal thrombocytopenia in 6.8% of live births. Advanced maternal age was significantly associated with preterm delivery (p=0.028). Women with a previous history of gestational thrombocytopenia had significantly higher rates of preterm delivery (30.8% vs 16.1%, p=0.041) and neonatal thrombocytopenia (16.7% vs 4.5%, p=0.017).* ***Conclusion:*** *Gestational thrombocytopenia was associated with a measurable burden of adverse fetomaternal outcomes, particularly preterm delivery, cesarean birth, postpartum hemorrhage, and neonatal thrombocytopenia. Women with recurrent gestational thrombocytopenia appeared to represent a higher-risk subgroup and may benefit from closer antenatal and neonatal surveillance.*

Keywords: Pregnancy; Thrombocytopenia; Pregnancy Outcome; Postpartum Hemorrhage; Premature Birth; Infant, Newborn

[***How to Cite:*** Farooq A, Noor S, Begum TJ. Fetomaternal outcomes in pregnant women with gestational thrombocytopenia. *Biol. Clin. Sci. Res. J.*, **2025;** 6(4): 269-273. doi: https://doi.org/10.54112/bcsrj.v6i4.2227]

Introduction

Gestational thrombocytopenia (GT) is the most common hematological disorder encountered during pregnancy, defined as a platelet count below 150 × 10⁹/L occurring in the absence of a pre-existing platelet disorder or systemic disease. It accounts for approximately 70–80% of all cases of thrombocytopenia diagnosed in obstetric settings and affects an estimated 5–12% of all pregnancies (1). Unlike immune or disease-associated thrombocytopenias, GT is predominantly benign, typically manifesting in the third trimester with mild platelet reduction and resolving spontaneously within weeks after delivery (2). However, growing evidence from recent literature has highlighted that even gestational thrombocytopenia may be associated with clinically significant adverse fetomaternal outcomes, particularly when platelet counts fall to moderate or severe levels (3).

The pathophysiology of GT is multifactorial. The predominant mechanism is hemodilution secondary to the physiological expansion of plasma volume that occurs during pregnancy. Additional contributing factors include increased platelet sequestration and consumption within the placental intervillous space, accelerated platelet turnover driven by elevated thromboxane-A2 concentrations in the second and third trimesters, and the unique hemodynamic characteristics of placental blood flow, which closely resemble those of the spleen and liver, leading to platelet trapping and destruction (4). These mechanisms collectively result in a physiological reduction in circulating platelet counts, particularly during the latter half of pregnancy (5).

Maternal complications attributable to thrombocytopenia in pregnancy include antepartum hemorrhage (APH), postpartum hemorrhage (PPH), surgical wound complications, and hemostatic challenges associated with regional anesthesia. PPH is of particular concern, as adequate platelet function is critical for hemostasis at the placental bed and at cesarean incision sites (6). Recent studies have demonstrated that even mild preoperative thrombocytopenia can increase peripartum hemorrhage risk in women undergoing cesarean delivery, and that lower platelet counts are independently associated with higher rates of severe PPH (7). The relationship between platelet count and hemorrhagic morbidity appears to follow a dose-response pattern, with risk increasing as platelet count declines (8).

Neonatal thrombocytopenia (NTP) is a recognized but incompletely understood consequence of maternal platelet disorders during pregnancy. In the setting of GT, the risk of neonatal platelet depression is generally low; however, in the presence of immune-mediated or recurrent maternal thrombocytopenia, the risk of NTP is substantially elevated (9). Studies examining the relationship between maternal and neonatal platelet counts have shown that neonates born to thrombocytopenic mothers, particularly those with immune thrombocytopenia, are at increased risk of platelet counts below 50 × 10⁹/L and associated intracranial hemorrhage (10).

Preterm birth has also been associated with thrombocytopenia in pregnancy, with proposed mechanisms including placental insufficiency, systemic inflammatory dysregulation, and uteroplacental vascular dysfunction. A diagnosis of thrombocytopenia in pregnancy has been shown to significantly increase the odds of preterm delivery, placental abruption, and poor neonatal Apgar scores compared to women with

normal platelet counts (11). Advanced maternal age further compounds these risks, with older pregnant women demonstrating higher rates of cesarean delivery, preterm birth, and other adverse outcomes in the presence of comorbidities including platelet disorders (12).

In Pakistan, the burden of maternal and neonatal morbidity remains disproportionately high. Studies from across the country have consistently reported a meaningful prevalence of thrombocytopenia among pregnant women attending tertiary care facilities. Borhany et al. (13) documented thrombocytopenia in a substantial proportion of pregnant women in Karachi, noting that multigravida women were particularly at risk of severe platelet reduction and associated preterm delivery. Mumtaz et al. (11) reported from Lahore that thrombocytopenia was present in 12.1% of third-trimester women, with significantly higher rates of placental abruption, preterm delivery, stillbirth, and poor Apgar scores in the affected group. Despite this evidence, data specific to gestational thrombocytopenia, excluding hypertensive and immune etiologies, and its isolated impact on fetomaternal outcomes remain limited in the Pakistani literature. Most published data from Pakistan either focus on mixed etiologies of thrombocytopenia or are limited by small sample sizes and retrospective designs. The lack of locally applicable evidence hampers the ability of clinicians in Pakistan to risk-stratify and counsel pregnant women with GT effectively. This study was therefore conducted to assess fetomaternal outcomes in pregnant women with gestational thrombocytopenia at a tertiary care hospital in Multan, with stratified analysis by maternal age, gravidity, and previous history of the condition.

Methodology

This descriptive study was conducted in the Department of Obstetrics and Gynaecology, Ibn-e-Siena Hospital, Multan, from February 2024 to February 2025, after obtaining approval from the institutional ethics review committee. The study was designed to determine fetomaternal outcomes in pregnant women diagnosed with gestational thrombocytopenia. All eligible participants were enrolled after informed written consent. The target population comprised pregnant women receiving antenatal care and planning delivery at the study hospital. The diagnosis of gestational thrombocytopenia was based on a platelet count of less than 150 × 10^9/L on complete blood count in previously healthy pregnant women with no evidence of thrombocytopenia before pregnancy.

A sample size of 176 pregnant women was calculated using the WHO sample size calculator by applying the single population proportion formula. The calculation was based on a reported frequency of neonatal thrombocytopenia of 4.3%, with a 95% confidence level and an absolute precision of 3%. Participants were recruited through non-probability consecutive sampling. Pregnant women aged 18 to 45 years, irrespective of parity or gravidity, who were registered at the antenatal clinic, fulfilled the operational definition of gestational thrombocytopenia, and were willing to deliver at Ibn-e-Siena Hospital, Multan, were included in the study. Women with hypertensive disorders of pregnancy, including preeclampsia, eclampsia, and HELLP syndrome, as well as those with amniotic fluid embolism, disseminated intravascular coagulation, systemic lupus erythematosus, chronic liver disease, or thrombotic thrombocytopenia, were excluded on the basis of clinical history and medical record review.

After enrollment, baseline demographic and obstetric information was recorded on a structured proforma, including maternal age, gravidity, and previous history of gestational thrombocytopenia. All women were then followed prospectively until delivery to document fetomaternal outcomes. Maternal outcomes included gestational age at delivery, antepartum hemorrhage, postpartum hemorrhage, mode of delivery, and stillbirth. Gestational age at birth was categorized as preterm when delivery occurred before 37 completed weeks of gestation and full term when delivery occurred between 37 and 42 completed weeks, based on the last menstrual period. Antepartum hemorrhage was defined as any bleeding from or into the genital tract occurring from 24 weeks of gestation until before the birth of the baby, assessed by the presence of blood on sanitary pads. Postpartum hemorrhage was defined as blood loss greater than 500 mL following vaginal delivery or greater than 1000 mL after cesarean section, measured by collection of immediate blood loss in a kidney tray. Stillbirth was defined as fetal death occurring after 28 weeks of pregnancy but before or during birth.

All live-born neonates underwent complete blood count testing within 24 hours of birth from a single laboratory in order to ensure consistency in laboratory measurements. Neonatal thrombocytopenia was defined as a platelet count below 150 × 10^9/L. Neonates identified with thrombocytopenia were managed in the pediatric medicine department according to the hospital's standard treatment protocols. All relevant clinical and laboratory findings were entered into the study proforma by the research team.

Data were entered and analyzed using SPSS version 23. The normality of numerical variables was assessed by the Shapiro-Wilk test. Continuous variables, including maternal age, gravida, and gestational age at delivery, were summarized as mean and standard deviation. Categorical variables, including previous history of gestational thrombocytopenia, preterm and full-term delivery, antepartum hemorrhage, postpartum hemorrhage, mode of delivery, stillbirth, and neonatal thrombocytopenia, were presented as frequencies and percentages. Stratification was performed for age, gravidity, and previous history of gestational thrombocytopenia to assess their effect on fetomaternal outcomes. Post-stratification comparisons were made using the chi-square test, and a p-value of 0.05 or less was considered statistically significant.

Results

A total of 176 pregnant women with gestational thrombocytopenia were included in this descriptive study conducted at the Department of Obstetrics & Gynaecology, Ibn-e-Siena Hospital, Multan. The mean maternal age was 28.94 ± 5.63 years, while the mean gravida was 2.71 ± 1.36. Most participants were 26–35 years of age, and a slight majority were multigravida. Previous history of gestational thrombocytopenia was present in a smaller proportion of women. The baseline demographic and obstetric profile of the study participants is presented in Table 1.

Table 1: Demographic and baseline obstetric characteristics of study participants (n = 176)

Variable	Category	n (%) / Mean ± SD
Age (years)	Mean ± SD	28.94 ± 5.63
	18–25 years	58 (33.0)
	26–35 years	91 (51.7)
	36–45 years	27 (15.3)
Gravida	Mean ± SD	2.71 ± 1.36
	Primigravida	52 (29.5)
	Multigravida	124 (70.5)
Previous history of gestational thrombocytopenia	Yes	39 (22.2)
	No	137 (77.8)

Regarding maternal and neonatal outcomes, the mean gestational age at delivery was 37.61 ± 1.84 weeks. Most women delivered at full term, whereas preterm birth was observed in nearly one-fifth of cases. Antepartum hemorrhage and postpartum hemorrhage were relatively uncommon, while cesarean delivery was slightly more frequent than spontaneous vaginal delivery. Stillbirth and neonatal thrombocytopenia were observed in a smaller but clinically relevant proportion of cases. The distribution of fetomaternal outcomes is shown in Table 2. On stratification by maternal age, adverse fetomaternal outcomes tended to be more frequent among women aged 36–45 years. Preterm delivery, postpartum hemorrhage, and neonatal thrombocytopenia were proportionally higher in the older age group, although only the association between maternal age and preterm delivery reached statistical significance (p = 0.028). Details are given in Table 3.When outcomes

were analyzed according to gravidity, multigravida women showed slightly higher frequencies of cesarean delivery, postpartum hemorrhage, and neonatal thrombocytopenia than primigravida women. However, these differences were not statistically significant. The post-stratification analysis by gravidity is presented in Table 4.Women with a previous history of gestational thrombocytopenia demonstrated comparatively poorer obstetric and neonatal outcomes. Preterm delivery (30.8% vs. 16.1%, p = 0.041) and neonatal thrombocytopenia (16.7% vs. 4.5%, p = 0.017) were significantly more frequent in women with previous gestational thrombocytopenia. These findings are summarized in Table 5

Table 2: Fetomaternal outcomes among pregnant women with gestational thrombocytopenia (n = 176)

Variable	Category	n (%) / Mean ± SD
Gestational age at delivery (weeks)	Mean ± SD	37.61 ± 1.84
Gestational age at delivery	Preterm (<37 weeks)	34 (19.3)
	Full term (37–42 weeks)	142 (80.7)
Antepartum hemorrhage	Yes	11 (6.3)
	No	165 (93.7)
Postpartum hemorrhage	Yes	16 (9.1)
	No	160 (90.9)
Mode of delivery	Cesarean section	97 (55.1)
	SVD	79 (44.9)
Stillbirth	Yes	8 (4.5)
	No	168 (95.5)
Neonatal thrombocytopenia*	Yes	12 (6.8)
	No	156 (88.6)
	Not applicable (stillbirths)	8 (4.5)

**Neonatal thrombocytopenia was assessed among live-born neonates within 24 hours of birth.*

Table 3: Stratification of fetomaternal outcomes by maternal age group (n = 176)

Outcome	18–25 yrs n=58	26–35 yrs n=91	36–45 yrs n=27	p-value
Preterm delivery	8 (13.8)	16 (17.6)	10 (37.0)	0.028
Antepartum hemorrhage	3 (5.2)	5 (5.5)	3 (11.1)	0.521
Postpartum hemorrhage	3 (5.2)	8 (8.8)	5 (18.5)	0.143
Cesarean section	28 (48.3)	51 (56.0)	18 (66.7)	0.267
Stillbirth	2 (3.4)	4 (4.4)	2 (7.4)	0.698
Neonatal thrombocytopenia**	3 (5.4)	6 (6.9)	3 (12.0)	0.456

***Calculated among live births in each age group.*

Table 4: Stratification of fetomaternal outcomes by gravidity (n = 176)

Outcome	Primigravida n=52	Multigravida n=124	p-value
Preterm delivery	8 (15.4)	26 (21.0)	0.394
Antepartum hemorrhage	2 (3.8)	9 (7.3)	0.381
Postpartum hemorrhage	3 (5.8)	13 (10.5)	0.320
Cesarean section	25 (48.1)	72 (58.1)	0.220
Stillbirth	2 (3.8)	6 (4.8)	0.769
Neonatal thrombocytopenia*	3 (6.0)	9 (7.6)	0.711

**Calculated among live births in each gravidity group.*

Table 5: Stratification of fetomaternal outcomes by previous history of gestational thrombocytopenia (n = 176)

Outcome	Previous History Yes n=39	Previous History No n=137	p-value
Preterm delivery	12 (30.8)	22 (16.1)	0.041
Antepartum hemorrhage	4 (10.3)	7 (5.1)	0.261
Postpartum hemorrhage	6 (15.4)	10 (7.3)	0.122
Cesarean section	25 (64.1)	72 (52.6)	0.198
Stillbirth	3 (7.7)	5 (3.6)	0.274
Neonatal thrombocytopenia*	6 (16.7)	6 (4.5)	0.017

**Calculated among live births in each subgroup.*

Discussion

This descriptive study evaluated fetomaternal outcomes in 176 pregnant women with gestational thrombocytopenia and found that while the majority delivered at term with generally favorable outcomes, a clinically meaningful proportion experienced adverse events including preterm birth (19.3%), cesarean delivery (55.1%), postpartum hemorrhage (9.1%), stillbirth (4.5%), and neonatal thrombocytopenia (6.8%). These findings are broadly consistent with the contemporary international and regional literature on thrombocytopenia in pregnancy.

The mean maternal age of 28.94 ± 5.63 years and the predominance of multigravida women (70.5%) in our cohort closely reflect the obstetric profile at public tertiary care hospitals in Pakistan, where early marriage and higher parity remain prevalent. Borhany et al. (13) reported a similarly young mean age in their Pakistani cohort of thrombocytopenic pregnant women, with multigravida patients being disproportionately represented among those with severe platelet reduction. The recurrence of GT in 22.2% of participants in our study is notable; this rate is consistent with recently published evidence showing that women with a prior history of GT carry a heightened risk of recurrence in subsequent

gestations, likely due to persistent placental hemodynamic abnormalities (14).

The preterm delivery rate of 19.3% in our cohort is elevated compared to background rates in the general obstetric population. Mumtaz et al. (11) reported a preterm delivery rate of 29.4% in thrombocytopenic women from Lahore, while Mushahary et al. (12) from New Delhi documented that preterm birth was significantly higher in women with severe thrombocytopenia ($p = 0.011$) compared to those with mild platelet reduction. The statistically significant association between advanced maternal age and preterm delivery in our study (37.0% vs. 13.8%, $p = 0.028$) resonates with data from Fogerty and Kuter (3), who noted that older thrombocytopenic women have compounded risks due to underlying vascular and placental pathology. These findings collectively underscore the importance of close antenatal monitoring and early gestational age assessment in this population.

Cesarean delivery was performed in 55.1% of women in our study, a rate considerably higher than the national average but consistent with rates reported in thrombocytopenic obstetric populations in tertiary care settings regionally. Pishko and Marshall (2) noted that the mode of delivery in GT is primarily dictated by obstetric indications, with an implicit tendency toward surgical delivery when there is perceived hemorrhagic risk or fetal compromise. A recent multicenter study by Rottenstreich et al. (16) found a comparable cesarean rate of approximately 52–55% in women with gestational and immune-mediated thrombocytopenia and concluded that thrombocytopenia per se contributed to the higher surgical delivery burden through the compounding effect of associated pregnancy complications. Our stratification analysis showed numerically higher cesarean rates in multigravida women (58.1% vs. 48.1%) and in women with previous GT history (64.1% vs. 52.6%), though these differences did not reach statistical significance, likely due to sample size constraints.

Postpartum hemorrhage was documented in 9.1% of our cohort, a rate somewhat exceeding global estimates for unselected obstetric populations. Arcudi et al. (8) demonstrated that among women with moderate thrombocytopenia, the risk of PPH increased steeply as platelet counts fell, especially below 95×10^9/L. This gradient of risk was further amplified in women with blood group O. Lee et al. (17) similarly established that mild thrombocytopenia prior to cesarean section significantly raised the risk of PPH and blood transfusion requirements. In our study, women of advanced maternal age (18.5%) and those with a prior GT history (15.4%) had the highest numeric PPH rates, supporting the view that these subgroups warrant targeted hemostatic preparedness plans.

Antepartum hemorrhage was observed in 6.3% of cases, a finding aligned with data from Majeed et al. (18), who reported placental complications including abruption in a subset of thrombocytopenic women from a Pakistani tertiary center and noted that the risk was not uniformly distributed across etiological subgroups. Stillbirth was recorded in 4.5% of our cohort. While this rate is relatively low in absolute terms, it represents a clinically significant burden in a high-volume obstetric facility such as Ibn-e-Siena Hospital, Multan. Zhang et al. (10), in a 2024 systematic review and meta-analysis, reported that thrombocytopenia, particularly immune-mediated forms, was independently associated with adverse fetal outcomes including stillbirth and fetal growth restriction, with the risk being highest in women with platelet counts below 50×10^9/L.

Neonatal thrombocytopenia was identified in 6.8% of live births in our study. This rate is consistent with the upper limit of estimates reported by Houri et al. (9), who found that while the absolute rate of neonatal thrombocytopenia was low among women with GT, the risk rose with decreasing maternal platelet counts. Our finding of a significantly higher rate of NTP in women with a previous GT history (16.7% vs. 4.5%, $p = 0.017$) warrants particular attention. This association suggests a possible immune mechanism in recurrent GT, potentially involving low-grade antiplatelet antibody activity that may insufficiently manifest clinically in the mother but exerts a transplacental effect on the neonate. Park et al. (19) noted that the distinction between GT and subclinical immune thrombocytopenia can be challenging in recurrent cases, and that neonatal platelet monitoring at birth is warranted when maternal thrombocytopenia has recurred in a prior gestation.

The significantly higher rates of preterm delivery ($p = 0.041$) and neonatal thrombocytopenia ($p = 0.017$) in women with a prior GT history in our study align with findings from Kadiyala et al. (20), who reported that the severity and recurrence of GT were positively correlated with adverse neonatal outcomes. These findings collectively identify women with recurrent GT as a distinctly high-risk subgroup warranting enhanced antenatal surveillance, serial platelet monitoring, and multidisciplinary input at the time of delivery. The higher burden of adverse outcomes in this group may reflect both cumulative uteroplacental dysfunction across pregnancies and the possibility of a subclinical immune platelet mechanism.

This study has several limitations, including its descriptive and single-center design, absence of a comparison group, lack of data on platelet nadir values and severity subclassification, and potential referral bias inherent to a tertiary hospital setting. Despite these limitations, the study provides original local data on an understudied area of obstetric hematology in Pakistan and contributes to the growing evidence base for clinician decision-making in this context. Future multicenter analytical studies with larger sample sizes and platelet severity stratification are needed to confirm these findings and inform evidence-based management guidelines for Pakistani obstetric practice..

Conclusion

Gestational thrombocytopenia was associated with clinically important maternal and neonatal complications in this cohort. Careful antenatal monitoring, delivery planning, and early neonatal platelet assessment may improve fetomaternal outcomes, especially in women with a previous history of the condition.

Declarations

Data Availability statement

All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department concerned. (IRBEC-IBSNMU-23N-24)

Consent for publication

Approved

Funding

Not applicable

Conflict of interest

The authors declared the absence of a conflict of interest.

Author Contribution

AF (PGR)

Contributed to study design, data collection and initial manuscript drafting

Assisted in data acquisition, literature review and manuscript editing

Performed statistical analysis and contributed to interpretation of results

SN (PGR)

Helped in methodology development, data organization and manuscript formatting

Contributed to patient recruitment, data entry and results compilation

Assisted in referencing, proofreading and final revisions of the manuscript

TJB (Professor)

Provided guidance in study execution and critically reviewed the manuscript

Supervised the research, coordinated among authors, finalized the manuscript and approved the final version

All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

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