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FREQUENCY OF THROMBOCYTOPENIA IN PREGNANCY AND FETOMATERNAL OUTCOME

Original Research

Sonia[1]*, Safia Maqsood[1]
[1]Ghulam Mohammad Mahar Medical College Hospital Sukkur, Pakistan.
Corresponding Author: Sonia, Ghulam Mohammad Mahar Medical College Hospital Sukkur, Pakistan, samejosonia@gmail.com
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ABSTRACT

Background: Gestational thrombocytopenia is the second most common hematological abnormality during pregnancy after anemia, often diagnosed incidentally during routine antenatal care. It poses significant clinical concern due to its association with maternal bleeding risks and adverse perinatal outcomes. Despite its prevalence, there is limited regional data assessing its frequency and obstetric implications, particularly in resource-limited settings. This study was conducted to evaluate the frequency of thrombocytopenia in pregnancy and to assess associated fetomaternal outcomes.

Objective: To determine the frequency of thrombocytopenia in pregnant females and analyze fetomaternal outcomes in those diagnosed with thrombocytopenia.

Methods: This descriptive study was conducted over six months (June 20, 2024 to December 20, 2024) at the Department of Obstetrics & Gynecology, Ghulam Muhammad Mahar Medical College Hospital, Sukkur. A total of 100 pregnant women aged 18–40 years with gestational age >32 weeks and no prior medical complications were enrolled through consecutive sampling. Blood samples were obtained to assess platelet counts. Thrombocytopenia was defined as platelet count <150,000/µL. Participants were followed until delivery, and outcomes such as antepartum hemorrhage, preterm labor, emergency cesarean delivery, and postpartum hemorrhage were documented. Data were analyzed using SPSS version 26.0.

Results: The mean age of participants was 28.61 ± 7.02 years, and mean gestational age was 34.79 ± 2.10 weeks. The median platelet count was 199.0 $\times 10^3$/µL (IQR: 134.00). Gestational thrombocytopenia was identified in 43% (n=43) of cases. Among these, 18.6% experienced antepartum hemorrhage, 62.8% had preterm labor, 76.7% underwent emergency cesarean delivery, and 41.9% developed postpartum hemorrhage. Socioeconomic status had a statistically significant association with thrombocytopenia ($p < 0.05$), while other variables, including age, parity, BMI, hypertension, diabetes, anemia, and family history, showed no significant impact ($p > 0.05$).

Conclusion: The frequency of gestational thrombocytopenia is high and significantly contributes to adverse obstetrical outcomes. Early identification through regular screening may help mitigate these complications.

Keywords: Anemia, Cesarean Section, Gestational Thrombocytopenia, Hemorrhage, Platelet Count, Pregnancy Complications, Preterm Labor.

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INTRODUCTION

Pregnancy is a unique physiological state that brings about significant hematologic changes, many of which are adaptive and necessary to support both maternal and fetal health. However, these changes can also predispose pregnant women to various hematological disorders or worsen preexisting conditions, thereby increasing the risk of maternal and fetal morbidity and mortality. Among these disorders, thrombocytopenia—defined as a platelet count below 150,000/µL—is the second most common hematological abnormality during pregnancy, following anemia (1,2). Its presence can raise serious clinical concerns, particularly the risk of postpartum hemorrhage, intrauterine growth restriction, and preterm delivery (3). Thrombocytopenia during pregnancy poses a diagnostic challenge, often prompting consultation with hematologists, especially when the platelet count is markedly reduced or when the etiology is unclear. The differential diagnosis is largely influenced by the severity of thrombocytopenia and the gestational age at which it is identified (4,5). While its exact etiology remains uncertain, it is generally accepted that gestational thrombocytopenia accounts for approximately 70–80% of all cases, followed by hypertensive disorders in about 20%, and immune thrombocytopenic purpura (ITP) in 3–4% of cases, which are comparatively rare during pregnancy (6). Furthermore, some studies have reported that up to 60% of pregnant women may experience some form of pregnancy-associated thrombocytopenia (7,8).

Despite the high prevalence, most pregnancies complicated by thrombocytopenia tend to have favorable outcomes for both the mother and the fetus. Nevertheless, much of the available evidence is based on retrospective analyses conducted at single institutions, limiting the generalizability of findings (9,10). In regions like Pakistan, there appears to be a wide variation in reported incidence rates, with limited data on how thrombocytopenia influences maternal and fetal outcomes. This underscores a significant gap in localized research, especially in tertiary care settings, where accurate diagnosis and timely intervention could improve clinical practices and patient outcomes. In light of these considerations, the current study aims to determine the frequency of thrombocytopenia in pregnant women and assess its impact on fetomaternal outcomes among patients attending a tertiary care hospital. This research intends to generate updated, region-specific evidence to guide clinical decision-making and minimize complications associated with thrombocytopenia in pregnancy.

METHODS

This descriptive cross-sectional study was conducted in the Department of Obstetrics and Gynecology at Ghulam Muhammad Mahar Medical College Hospital, Sukkur, over a period of six months from June 20, 2024, to December 20, 2024. Ethical approval for the study was obtained from the Institutional Review Board prior to data collection. A total of 100 pregnant women were enrolled using a non-probability consecutive sampling technique. The sample size was estimated with a 95% confidence level, 6% margin of error, and an expected prevalence of thrombocytopenia in pregnancy of 10.4% (11). Written informed consent was obtained from all participants after a clear explanation of the study objectives and procedures. Participants were included if they were pregnant women aged 18 to 40 years, at a gestational age beyond 32 weeks, and attending antenatal check-ups with otherwise normal pregnancies. Women with preexisting medical conditions such as systemic lupus erythematosus (SLE), immune thrombocytopenic purpura (ITP), rheumatic diseases, or preeclampsia (defined as blood pressure ≥140/90 mmHg or on antihypertensive treatment) were excluded. Additional exclusion criteria included women with missing platelet data during pregnancy, labor, or postpartum; irregular antenatal follow-up; known hereditary thrombocytopenia; hematologic malignancies or bone marrow failure confirmed via complete blood count (CBC), peripheral blood film, and bone marrow examination; or those diagnosed with placental abruption on ultrasonography.

Eligible participants were recruited from the outpatient department. Baseline demographic data were recorded using a structured proforma. A venous blood sample was drawn and analyzed in the hospital's laboratory to assess platelet count using standardized hematology analyzers. Thrombocytopenia was defined as a platelet count of less than 150,000/µL during the third trimester. All participants were followed through delivery and into the early postpartum period. Antepartum hemorrhage was documented if vaginal bleeding occurred before labor (12). Preterm delivery was defined as birth occurring before 37 completed weeks of gestation. The mode of delivery was recorded, and any emergency cesarean section was noted. Following delivery, each woman was observed for 24 hours in the postnatal ward. Postpartum hemorrhage was defined as blood loss exceeding 500 mL following vaginal delivery or 1,000 mL after

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cesarean section. Any complications encountered were managed according to standard clinical protocols. All collected data were entered and analyzed using SPSS version 26.0. Frequencies and percentages were calculated for thrombocytopenia and associated obstetric outcomes, including preterm labor, antepartum hemorrhage, postpartum hemorrhage, and emergency cesarean section.

RESULTS

A total of 100 pregnant women were enrolled in the study, with a mean age of 28.61 ± 7.02 years and a mean gestational age of 34.79 ± 2.10 weeks. The mean height, weight, and body mass index (BMI) were 1.58 ± 0.06 meters, 74.05 ± 8.55 kg, and 29.81 ± 3.83 kg/m², respectively. Regarding parity, 28% were primigravida, 16% were primiparous, and 56% were multiparous. Comorbidities included hypertension in 45% of participants, gestational diabetes in 55%, and anemia in 43%. Additionally, 17% of women reported a family history of thrombocytopenia. Socioeconomically, 60% belonged to the lower class, 28% to the middle class, and 12% to the higher class. The median platelet count among participants was 199.0 $\times 10^3/\mu L$ with an interquartile range (IQR) of 134.0. The distribution of platelet counts was found to be non-normal based on the Shapiro-Wilk test ($p < 0.001$). Overall, gestational thrombocytopenia was observed in 43% of the women. Among the 43 women diagnosed with thrombocytopenia, 8 (18.6%) experienced antepartum hemorrhage, 27 (62.8%) had preterm labor, 33 (76.7%) underwent emergency cesarean section, and 18 (41.9%) developed postpartum hemorrhage.

Stratified analysis showed no statistically significant difference in the frequency of thrombocytopenia between age groups 18–29 years (45.3%) and 30–40 years (40.4%, $p > 0.05$). Similarly, thrombocytopenia occurred in 40.6% of women presenting between 32–35 weeks and in 47.2% of those presenting between 36–38 weeks ($p > 0.05$). Thrombocytopenia was more common among primigravida women (50%) compared to primiparous (37.5%) and multiparous women (41.1%), though these differences were not statistically significant ($p > 0.05$). Based on BMI categories, thrombocytopenia was found in 35.7% of women with normal BMI, 44.1% of overweight, and 44.2% of obese women ($p > 0.05$). No statistically significant association was observed between thrombocytopenia and hypertension ($p = 0.174$), gestational diabetes ($p = 0.792$), anemia ($p = 0.835$), or family history of thrombocytopenia ($p = 0.403$). However, a significant association was found with socioeconomic status. Thrombocytopenia was more prevalent among women from the lower socioeconomic class (55%) compared to those from middle (17.9%) and higher classes (41.7%, $p = 0.005$).

Table 1: Basic demographic information of pregnant females (n = 100)

Age (in years)	28.61 ± 7.02
Gestational age (weeks)	34.79 ± 2.10
Height (m)	1.58 ± 0.06
Weight (Kg)	74.05 ± 8.55
Body mass index (kg/m^2)	29.81 ± 3.83
Parity	
Primigravida	28 (28%)
Primiparous	16 (16%)
Multiparous	56 (56%)
History of	
Hypertension	45 (45%)
Diabetes	55 (55%)
Anemia	43 (43%)
Family history of thrombocytopenia	17 (17%)
Socioeconomic status	
Low	60 (60%)
Middle	28 (28%)
High	12 (12%)

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Table 2: Distribution of platelet count

Platelet count		
Median (IQR): 199.0 (134.00)		
Shapiro-Wilk test	df	P-value
0.924	100	0.000

Table 3: Fetomaternal outcome in females with thrombocytopenia (n = 43)

	Frequency
Antepartum hemorrhage	8 (18.6%)
Preterm labor	27 (62.8%)
Emergency cesarean section	33 (76.7%)
Postpartum hemorrhage	18 (41.9%)

Table 4: Comparison of thrombocytopenia with different characteristics of pregnant females (n = 100)

		Thrombocytopenia		P-value
		Yes (n=43)	No (n=57)	
Age (years)	18-29	24 (45.3%)	9 (54.7%)	0.624
	30-40	19 (40.4%)	28 (59.6%)	
Gestational Age (weeks)	32-35	26 (40.6%)	38 (59.4%)	0.522
	36-38	17 (47.2%)	19 (52.8%)	
Parity	Primigravida	14 (50.0%)	14 (50.0%)	0.656
	Primiparous	6 (37.5%)	10 (62.5%)	
	Multiparous	23 (41.1%)	33 (58.9%)	
Body mass index	Normal	5 (35.7%)	9 (64.3%)	0.838
	Overweight	15 (44.1%)	19 (55.9%)	
	Obese	23 (44.2%)	29 (55.8%)	
Hypertension	Present	16 (35.6%)	29 (64.4%)	0.174
	Absent	27 (49.1%)	28 (50.9%)	
Diabetes	Present	23 (41.8%)	32 (58.2%)	0.792
	Absent	20 (44.4%)	25 (55.6%)	
Anemia	Present	19 (44.2%)	24 (55.8%)	0.835
	Absent	24 (42.1%)	33 (57.9%)	
Family history of thrombocytopenia	Present	24 (47.1%)	27 (52.9%)	0.403
	Absent	19 (38.8%)	30 (61.2%)	
Socioeconomic status	Low	33 (55.0%)	27 (45.0%)	0.005
	Middle	5 (17.9%)	23 (82.1%)	
	High	5 (41.7%)	7 (58.3%)	

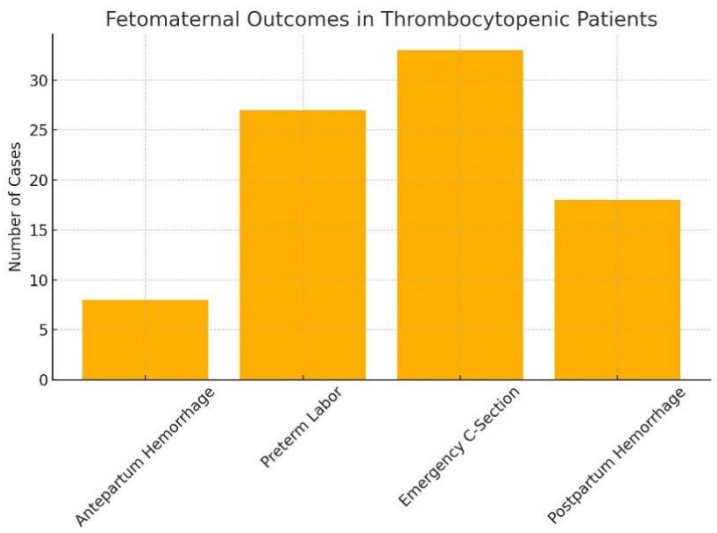

Figure 1 Fetomaternal Outcomes in Thrombocytopenic Patients

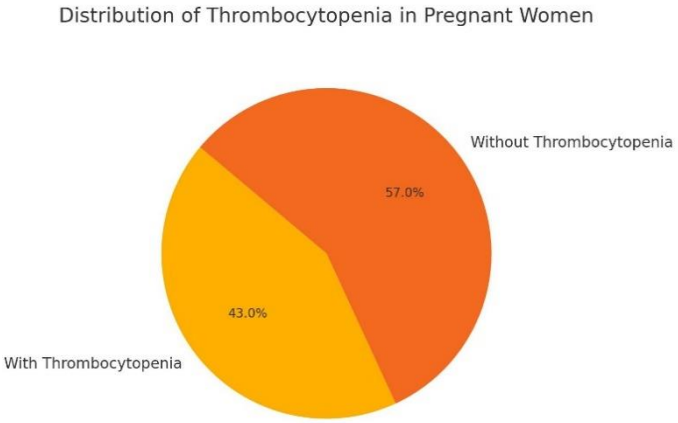

Figure 2 Distribution of Thrombocytopenia in Pregnant Women

DISCUSSION

In the present study, the observed median platelet count among pregnant women was 199.0 ×10³/µL (IQR: 134.00), with gestational thrombocytopenia detected in 43% of cases. This proportion is notably higher than that reported in several previous studies where frequencies ranged from 8.8% to 22.1% in most populations (13,14). However, some smaller-scale investigations conducted in different regions have reported considerably higher rates of up to 66%, underscoring the variability in prevalence likely influenced by differences in population characteristics, diagnostic criteria, and antenatal screening practices (15,16). This inconsistency highlights the importance of region-specific data to inform local clinical guidelines and interventions. The current findings emphasize the clinical relevance of thrombocytopenia during pregnancy, especially given its association with adverse fetomaternal outcomes. Among the women with thrombocytopenia in this study, 18.6% experienced antepartum hemorrhage, 62.8% had preterm labor, 76.7% underwent emergency cesarean delivery, and 41.9% developed postpartum hemorrhage. These rates are substantially higher than those reported in earlier studies, where preterm delivery ranged from 2.7% to 27.1%, postpartum hemorrhage from 7.5% to 27.14%, and emergency cesarean sections from 28% to 60.2% (14–17). The higher proportion of complications in this cohort suggests either a more severe spectrum of thrombocytopenia or potential delays in diagnosis and intervention in the local healthcare setting.

The pathophysiology of gestational thrombocytopenia remains incompletely understood. Hypothesized mechanisms include hemodilution due to plasma volume expansion, increased platelet sequestration in the placenta, mild immune-mediated platelet destruction, alterations in von Willebrand factor and ADAMTS-13 activity, and insufficient thrombopoietin response (18,19). The typical onset in late pregnancy, spontaneous resolution after delivery, and recurrence in subsequent pregnancies point to a physiologic adaptation rather than a pathological process in most cases (20). Nevertheless, the potential for adverse outcomes warrants clinical vigilance. One of the strengths of this study is the detailed follow-up of fetomaternal outcomes, providing a comprehensive picture of complications associated with thrombocytopenia in a tertiary care setting. The inclusion of stratified analysis to explore potential confounders such as parity, BMI, and comorbidities strengthens the reliability of the findings. The observation that thrombocytopenia was significantly associated with low socioeconomic status adds valuable insight into health disparities that may influence maternal outcomes.

However, the study has several limitations. The sample size, although adequate for descriptive analysis, restricts the generalizability of the findings, particularly in relation to less frequent outcomes such as maternal mortality. The use of a non-probability sampling technique may have introduced selection bias. Additionally, the absence of data on the severity of thrombocytopenia and its correlation with outcome severity limits the clinical applicability of the findings. The study also did not compare outcomes between thrombocytopenic and non-thrombocytopenic women, which would have further clarified the degree of risk conferred by this condition. Future studies should consider larger, multicenter designs to enhance representativeness and statistical power. Prospective cohort designs

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with detailed monitoring of platelet trends throughout pregnancy, stratification based on severity of thrombocytopenia, and correlation with specific outcomes will provide more robust evidence. Evaluation of neonatal outcomes such as thrombocytopenia in newborns or admission to neonatal intensive care units would also broaden the scope of clinical implications. Moreover, integrating biomarker studies to explore the pathophysiological basis could yield predictive indicators and therapeutic targets for thrombocytopenia during pregnancy. Overall, while this study reinforces the clinical significance of gestational thrombocytopenia, especially in resource-limited settings, there remains a critical need for more extensive and analytically rigorous research to inform evidence-based clinical decision-making and to minimize maternal and fetal complications.

CONCLUSION

The study concluded that gestational thrombocytopenia is a prevalent condition among pregnant women and is associated with an increased risk of adverse obstetrical outcomes. These findings highlight the importance of early identification and monitoring of platelet levels during antenatal care. By integrating routine platelet count screening into standard prenatal assessments, healthcare providers can take timely preventive measures to reduce the likelihood of complications and improve maternal and fetal health outcomes. This approach can contribute significantly to strengthening obstetric care practices in clinical settings.

AUTHOR CONTRIBUTION

Author	Contribution
Sonia*	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Safia Maqsood	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published

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