

Fetomaternal Outcome in Pregnancy with Gestational Thrombocytopenia

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Abstract

Introduction: Gestational thrombocytopenia, a common hematological disorder in pregnancy, poses risks to both maternal and neonatal health. This study aims to evaluate the fetomaternal outcomes in pregnancies complicated by gestational thrombocytopenia compared to those with normal platelet counts. **Methods:** This prospective cohort study was conducted over 12 months at Jalalabad Ragib-Rabeya Medical college hospital sylhet Bangladesh. It included 100 pregnant women diagnosed with gestational thrombocytopenia (platelet count $<150,000/\mu\text{L}$ after 20 weeks of gestation) and 100 matched controls with normal platelet counts. Maternal data included demographic information, obstetric and medical history, mode of delivery, incidence of pre-eclampsia, postpartum hemorrhage, and need for platelet transfusions. Fetal outcomes assessed were birth weight, Apgar scores, preterm birth rates, NICU admissions, and neonatal thrombocytopenia. Data were analyzed using t-tests for continuous variables and chi-square tests for categorical variables, with multivariate logistic regression to identify predictors of adverse outcomes. **Result:** The gestational thrombocytopenia group showed higher, though not statistically significant, rates of cesarean delivery (30% vs. 25%, $p=0.453$), pre-eclampsia (15% vs. 12%, $p=0.540$), and postpartum hemorrhage (18% vs. 10%, $p=0.110$). Platelet transfusions were required more frequently in the gestational thrombocytopenia group (8% vs. 2%, $p=0.052$). Fetal outcomes revealed lower mean birth weight (2950g vs. 3050g, $p=0.145$), higher preterm birth rates (14% vs. 10%, $p=0.371$), and more NICU admissions (20% vs. 12%, $p=0.132$) in the gestational thrombocytopenia group. Notably, neonatal thrombocytopenia was significantly more prevalent in the gestational thrombocytopenia group (10% vs. 2%, $p=0.017$). **Conclusion:** Gestational thrombocytopenia is associated with increased risks of certain maternal and neonatal complications. Vigilant monitoring and management are essential to improve outcomes in affected pregnancies. Further research is needed to develop targeted interventions and improve antenatal care practices.

Keywords: Gestational Thrombocytopenia, Maternal Outcomes, Neonatal Outcomes, Pre-Eclampsia, Postpartum Hemorrhage.

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INTRODUCTION

Thrombocytopenia, characterized by a low platelet count, is a common hematological disorder in pregnancy, second only to anemia. This condition, particularly in its gestational form, poses significant risks to both maternal and neonatal health. Gestational

thrombocytopenia (GT) accounts for approximately 75% of thrombocytopenia cases in pregnancy, with its prevalence ranging from 7% to 10% globally. However, the prevalence and impact of GT in South Asia, particularly Bangladesh, remain underexplored. A cross-sectional study conducted at the District Headquarter Hospital in Gujranwala, Pakistan, reported a 10%

prevalence of thrombocytopenia in the third trimester of pregnancy, highlighting the need for early detection and management to reduce fetomaternal morbidity and mortality [1]. This underscores the critical need for focused research on thrombocytopenia in pregnancy within the Bangladeshi context. Physiologically, pregnancy induces several changes that can lead to thrombocytopenia, such as increased plasma volume, hemodilution, and enhanced platelet consumption. These changes are often benign, manifesting as a gradual decline in platelet counts throughout pregnancy, with spontaneous recovery postpartum, a condition known as gestational thrombocytopenia [2]. However, distinguishing GT from other serious causes of thrombocytopenia, such as immune thrombocytopenia, preeclampsia, and HELLP syndrome, is vital. Conditions like preeclampsia and HELLP syndrome can exacerbate thrombocytopenia due to increased platelet destruction and consumption, leading to severe maternal complications [3]. A study by Reese *et al.*, highlighted that while GT is the most common form of thrombocytopenia during pregnancy, platelet counts below $100 \times 10^9/L$ are rare in uncomplicated pregnancies and warrant thorough investigation to exclude other etiologies [4]. Maternal complications associated with thrombocytopenia in pregnancy are significant and diverse. Anemia, postpartum hemorrhage (PPH), preeclampsia, and HELLP syndrome are among the most common complications. Thrombocytopenia can lead to severe bleeding tendencies, increasing the risk of PPH and necessitating interventions such as blood transfusions. Preeclampsia and HELLP syndrome, which involve high blood pressure and liver dysfunction, further complicate pregnancy outcomes by enhancing the severity of thrombocytopenia [5]. Neonatal outcomes are equally concerning, with thrombocytopenia linked to prematurity, low birth weight, and increased NICU admissions. A study focusing on neonatal thrombocytopenia found that severe cases often required respiratory support and were associated with higher mortality rates [6]. The epidemiological context of maternal health in Bangladesh reveals significant challenges that complicate the management of thrombocytopenia. Maternal anemia remains a prevalent issue, with a nationwide population-based survey indicating its association with adverse birth outcomes such as low birth weight and preterm birth [7]. Infectious diseases and other conditions like diabetes and hypertension further exacerbate the risks for pregnant women. The healthcare infrastructure, particularly in rural and marginalized communities, struggles to provide adequate care for high-risk pregnancies. Disparities in access to maternal healthcare services between urban and rural areas are stark, with urban slum populations facing significant barriers to obtaining quality care [8]. These challenges underscore the need for robust public health interventions and policies. The potential public health implications of improved management of gestational thrombocytopenia are profound. Effective public health policies prioritizing

antenatal care and early detection of thrombocytopenia can significantly reduce maternal and neonatal morbidity and mortality. Community-based interventions, such as the Safe Motherhood Promotion Project (SMPP) and the MANOSHI program implemented by BRAC, have shown success in improving maternal and neonatal health outcomes by emphasizing community engagement, education, and access to skilled healthcare providers [9]. Strengthening antenatal care services, including regular platelet count monitoring and management of underlying conditions, is crucial for better outcomes [5]. Empowering women's groups and community health workers to educate and support pregnant women can further enhance healthcare utilization and outcomes. Participatory learning and action (PLA) within community groups have proven effective in reducing maternal and neonatal mortality, demonstrating the importance of community involvement in healthcare initiatives [8]. The integration of these strategies into the healthcare system can improve the early detection and management of gestational thrombocytopenia, ultimately leading to better maternal and neonatal health outcomes in Bangladesh.

METHODS

This study employed a prospective cohort design to investigate the fetomaternal outcomes in pregnancies complicated by gestational thrombocytopenia. The study was conducted at Jalalabad Ragib-Rabeya Medical college hospital, Sylhet Bangladesh over a period of 12 months from 1st January 2022 to 31st December 2022. Eligible participants were pregnant women diagnosed with gestational thrombocytopenia, defined as a platelet count of less than $150,000/\mu L$ occurring after 20 weeks of gestation without an identifiable cause. A control group consisting of pregnant women with normal platelet counts was matched for age, parity, and gestational age at the time of diagnosis. In total, 200 participants were selected for the study, 100 in gestational thrombocytopenia group, and 100 in the control group. Data collection involved detailed maternal and fetal assessments. Maternal data included demographic information, obstetric history, medical history, and platelet counts at diagnosis and subsequent follow-ups. Additional maternal outcomes recorded included mode of delivery, incidence of preeclampsia, postpartum hemorrhage, and the need for platelet transfusions. Fetal assessments encompassed birth weight, Apgar scores at 1 and 5 minutes, preterm birth rates, neonatal intensive care unit (NICU) admissions, and neonatal thrombocytopenia. All data were entered into a standardized data collection form and subsequently analyzed using appropriate statistical methods. Comparisons between the gestational thrombocytopenia group and the control group were performed using t-tests for continuous variables and chi-square tests for categorical variables, with a significance level set at $p < 0.05$. Multivariate logistic regression analysis was conducted to adjust for potential

confounding factors and to identify independent predictors of adverse fetomaternal outcomes. Ethical approval was obtained from the institutional review board, and informed consent was secured from all participants prior to inclusion in the study. The results were disseminated through peer-reviewed journals and

conference presentations to inform clinical practice and guide future research in this area.

RESULTS

Table 1: Demographic and Clinical Characteristics of Study Participants (n=200)

Characteristic	Gestational Thrombocytopenia (n=100)	Control Group (n=100)	p-value
Age (years)	30.5 ± 4.2	29.8 ± 3.9	0.315
Parity	1.8 ± 0.7	1.6 ± 0.6	0.212
Gestational Age at Diagnosis (weeks)	28.7 ± 3.5	28.9 ± 3.6	0.654
Body Mass Index (BMI)	27.4 ± 2.9	26.9 ± 3.1	0.405
History of Pre-eclampsia	12 (12%)	10 (10%)	0.651
Smoking Status	5 (5%)	7 (7%)	0.552

The mean age of participants in the gestational thrombocytopenia group was 30.5 years (± 4.2), compared to 29.8 years (± 3.9) in the control group, with no significant difference observed between the groups ($p=0.315$). Parity, defined as the number of times a woman has given birth, was slightly higher in the gestational thrombocytopenia group (1.8 ± 0.7) than in the control group (1.6 ± 0.6), but this difference was not statistically significant ($p=0.212$). The gestational age at diagnosis was similar between the two groups, with a mean of 28.7 weeks (± 3.5) for the gestational thrombocytopenia group and 28.9 weeks (± 3.6) for the control group ($p=0.654$). Body Mass Index (BMI) was

also comparable, with the gestational thrombocytopenia group having a mean BMI of 27.4 (± 2.9) and the control group a mean BMI of 26.9 (± 3.1), showing no significant difference ($p=0.405$). Regarding the history of pre-eclampsia, 12% of women in the gestational thrombocytopenia group had experienced pre-eclampsia compared to 10% in the control group, a difference that was not statistically significant ($p=0.651$). Additionally, smoking status was similar between the groups, with 5% of women in the gestational thrombocytopenia group and 7% in the control group reporting they smoked ($p=0.552$).

Table 2: Maternal Outcomes of the participants (n=200)

Maternal Outcome	Gestational Thrombocytopenia (n=100)	Control Group (n=100)	p-value
Mode of Delivery (Cesarean)	30 (30%)	25 (25%)	0.453
Incidence of Pre-eclampsia	15 (15%)	12 (12%)	0.540
Postpartum Hemorrhage	18 (18%)	10 (10%)	0.110
Platelet Transfusions Required	8 (8%)	2 (2%)	0.052

The mode of delivery showed that 30% of women with gestational thrombocytopenia underwent cesarean sections compared to 25% in the control group, a difference that was not statistically significant ($p=0.453$). The incidence of pre-eclampsia was slightly higher in the gestational thrombocytopenia group (15%) compared to the control group (12%), but this difference was also not statistically significant ($p=0.540$). Postpartum hemorrhage was observed in 18% of women in the gestational thrombocytopenia group, which was

higher than the 10% observed in the control group, although this difference did not reach statistical significance ($p=0.110$). However, the need for platelet transfusions was notably higher in the gestational thrombocytopenia group, with 8% requiring transfusions compared to only 2% in the control group. This difference approached statistical significance ($p=0.052$), indicating a trend towards increased need for platelet transfusions in women with gestational thrombocytopenia.

Table 3: Fetal Outcomes of the participants (n=200)

Fetal Outcome	Gestational Thrombocytopenia (n=100)	Control Group (n=100)	p-value
Birth Weight (grams)	2950 ± 450	3050 ± 480	0.145
Apgar Score at 1 Minute < 7	12 (12%)	8 (8%)	0.349
Apgar Score at 5 Minutes < 7	5 (5%)	3 (3%)	0.472
Preterm Birth (<37 weeks)	14 (14%)	10 (10%)	0.371
NICU Admissions	20 (20%)	12 (12%)	0.132
Neonatal Thrombocytopenia	10 (10%)	2 (2%)	0.017

The mean birth weight for infants in the gestational thrombocytopenia group was 2950 grams (± 450), compared to 3050 grams (± 480) in the control group, with no significant difference observed ($p=0.145$). Apgar scores at 1 minute were less than 7 in 12% of the infants from the gestational thrombocytopenia group, compared to 8% in the control group, a difference that was not statistically significant ($p=0.349$). Similarly, Apgar scores at 5 minutes were less than 7 in 5% of the infants in the gestational thrombocytopenia group and 3% in the control group, also showing no significant difference ($p=0.472$). Preterm births, defined as births occurring before 37 weeks of gestation, were slightly higher in the gestational thrombocytopenia group at 14%, compared to 10% in the control group, but this difference was not statistically significant ($p=0.371$). NICU admissions were higher in the gestational thrombocytopenia group (20%) compared to the control group (12%), although this difference did not reach statistical significance ($p=0.132$). Notably, neonatal thrombocytopenia was significantly more prevalent in the gestational thrombocytopenia group, affecting 10% of the neonates, compared to just 2% in the control group, a difference that was statistically significant ($p=0.017$). This suggests that gestational thrombocytopenia in mothers is associated with a higher risk of neonatal thrombocytopenia.

DISCUSSION

The present study aimed to evaluate fetomaternal outcomes in pregnancies complicated by gestational thrombocytopenia. Our findings provide comprehensive insights into the demographic, maternal, and fetal outcomes associated with this condition, compared to a control group of pregnant women with normal platelet counts. The mean age of participants in the gestational thrombocytopenia group was slightly higher than in the control group, although not significantly different, consistent with other studies that have shown similar age distributions among thrombocytopenic and non-thrombocytopenic pregnant women [10]. Parity was also slightly higher in the gestational thrombocytopenia group, aligning with findings from studies that report no significant difference in parity between groups [10,11]. The similarity in gestational age at diagnosis between the two groups further supports the assertion that gestational thrombocytopenia often manifests later in pregnancy, as reported by Misra and Faruqi [12]. Regarding maternal outcomes, the mode of delivery via cesarean section was slightly higher in the gestational thrombocytopenia group but not significantly different from the control group. This is consistent with findings by Aiyelaagbe *et al.*, who reported similar cesarean section rates in women with thrombocytopenia [13]. The incidence of pre-eclampsia was also slightly higher in the gestational thrombocytopenia group, corroborating findings from Salih *et al.*, who highlighted the association between thrombocytopenia and pre-eclampsia [14]. Postpartum

hemorrhage, while more prevalent in the gestational thrombocytopenia group, did not reach statistical significance, which aligns with DiSciullo *et al.*'s findings that mild gestational thrombocytopenia does not significantly increase the risk of postpartum hemorrhage [15]. However, the higher requirement for platelet transfusions in the gestational thrombocytopenia group, approaching statistical significance, underscores the clinical importance of close monitoring and intervention, as noted in studies by Geetha *et al.*, [16]. Fetal outcomes revealed that mean birth weight was lower in the gestational thrombocytopenia group, although not significantly different from the control group. This finding is consistent with Jani *et al.*, who reported that birth weight increases with gestational age at delivery [17]. Apgar scores at 1 and 5 minutes were slightly lower in the gestational thrombocytopenia group, but the differences were not statistically significant, mirroring results from Abbasalizadeh *et al.*, who found similar Apgar scores in their comparative study [18]. Preterm births were more common in the gestational thrombocytopenia group, supporting findings by Bonifacio *et al.*, who reported higher rates of preterm births in thrombocytopenic pregnancies [19]. NICU admissions were also higher in the gestational thrombocytopenia group, reflecting the findings of several studies that highlight the increased need for NICU care among neonates born to mothers with thrombocytopenia [12,20]. The most notable finding was the significantly higher prevalence of neonatal thrombocytopenia in the gestational thrombocytopenia group, consistent with the work of Bonifacio *et al.*, who reported a strong association between maternal and neonatal thrombocytopenia [19]. This underscores the need for vigilant neonatal monitoring and management, especially in cases of maternal thrombocytopenia. Overall, the findings of this study are consistent with existing literature and highlight the importance of thorough antenatal care and monitoring in pregnancies complicated by gestational thrombocytopenia. The study by Misra and Faruqi provides a comprehensive overview of the increased risks associated with thrombocytopenia, including preterm delivery, low Apgar scores, and higher NICU admission rates [12]. Similarly, the work of Chauhan *et al.*, emphasizes the need for careful management of thrombocytopenia in pregnancy to mitigate adverse maternal and fetal outcomes [20]. The consistency of our findings with those reported in the literature supports the validity of our study and underscores the importance of ongoing research and clinical vigilance in managing gestational thrombocytopenia.

Limitations of The Study

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community.

CONCLUSION

In conclusion, this study highlights the significant fetomaternal complications associated with gestational thrombocytopenia. While the demographic characteristics between the gestational thrombocytopenia group and the control group were comparable, notable differences in maternal and fetal outcomes underscore the clinical importance of this condition. The increased incidence of pre-eclampsia, postpartum hemorrhage, and the need for platelet transfusions in the gestational thrombocytopenia group, although not always statistically significant, suggests a trend towards greater maternal morbidity. Similarly, the higher rates of preterm birth, NICU admissions, and especially neonatal thrombocytopenia in the gestational thrombocytopenia group indicate a significant impact on neonatal health. These findings emphasize the need for vigilant monitoring and management of pregnant women with gestational thrombocytopenia to mitigate adverse outcomes. Future research should focus on developing targeted interventions and improving antenatal care practices to enhance both maternal and neonatal health outcomes.

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