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Original Research Article

Comparative Evaluation of Fetomaternal Outcome in Gestational Thrombocytopenia with Thrombocytopenia Due to Hypertensive Disorders of Pregnancy

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Abstract:

Aims: To compare the fetomaternal outcomes in gestational thrombocytopenia with thrombocytopenia due to hypertensive disorders of pregnancy.

Objectives: The objectives of the study were to evaluate fetomaternal outcomes in gestational thrombocytopenia, to assess fetomaternal outcomes in thrombocytopenia associated with hypertensive disorders of pregnancy, and to compare the fetomaternal outcomes between gestational thrombocytopenia and thrombocytopenia secondary to hypertensive disorders of pregnancy.

Materials and Methods: This observational study was conducted in the Department of Obstetrics and Gynaecology at Vardhman Mahavir Medical College and Safdarjung Hospital, New Delhi, over a period of 18 months. A total of 304 antenatal women beyond 20 weeks of gestation with persistent thrombocytopenia (<1.5 lakh/mm³) were enrolled. Patients were divided into Group A comprising 152 women with thrombocytopenia associated with hypertensive disorders of pregnancy and Group B comprising 152 women with gestational thrombocytopenia. Detailed history, clinical examination, complete blood count, coagulation profile, liver and renal function tests, and obstetric ultrasonography were performed. Maternal and fetal outcomes were assessed until discharge. Statistical analysis was performed using SPSS version 17.0, and p value <0.05 was considered statistically significant.

Results: Majority of patients in both groups belonged to the 21–30 years age group and presented at term gestation. Moderate thrombocytopenia was the most common presentation in both groups. Deranged liver enzymes, elevated bilirubin, renal dysfunction, coagulation abnormalities, postpartum hemorrhage, and platelet transfusion requirements were significantly more common in Group A compared to Group B. Vaginal delivery was the most common mode of delivery in both groups, although cesarean section rates were higher in hypertensive thrombocytopenia. Neonatal complications including NICU admission, neonatal demise, and neonatal thrombocytopenia were also more frequent in Group A.

Conclusion: Gestational thrombocytopenia is generally a benign condition with favorable maternal and fetal outcomes and spontaneous postpartum recovery. In contrast, thrombocytopenia associated with hypertensive disorders of pregnancy is associated with increased maternal complications such as postpartum hemorrhage, coagulation abnormalities, liver and renal dysfunction, along with poorer neonatal outcomes. Early diagnosis, close monitoring, and multidisciplinary management are essential to improve fetomaternal outcomes in thrombocytopenic pregnancies.

Keywords: Thrombocytopenia, pregnancy, Preeclampsia.

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Introduction

Thrombocytopenia, defined as a platelet count below 1.5 lakh/mm³, is the second most common hematological disorder in pregnancy after anemia and affects nearly 10% of pregnant women. Around 75% of cases are due to gestational thrombocytopenia, while about 25% are associated with hypertensive disorders of pregnancy such as preeclampsia and HELLP syndrome. Other less common causes include immune thrombocytopenic purpura (ITP), disseminated intravascular coagulation (DIC), systemic lupus erythematosus, infections, drug-induced thrombocytopenia, thrombotic microangiopathies, and malignancies. Platelet counts normally decline during late pregnancy due to physiological changes and usually return to normal in the postpartum period. [1-3]

Gestational thrombocytopenia is the most common and generally benign form of thrombocytopenia in pregnancy. It usually develops during the third trimester, with platelet counts ranging between 1–1.5 lakh/mm³, mainly due to hemodilution and increased splenic sequestration. It resolves spontaneously after delivery and is not commonly associated with adverse maternal or fetal outcomes, although mild to moderate neonatal thrombocytopenia may occasionally occur. Most cases do not require any specific treatment and are managed conservatively with monitoring [3-5]

Thrombocytopenia associated with hypertensive disorders of pregnancy is more severe and clinically significant. It usually develops after 20 weeks of gestation and is often associated with platelet counts below 1 lakh/mm³ along with hypertension. Conditions such as preeclampsia and HELLP syndrome are linked with increased risks of placental abruption, preterm delivery, low birth weight, acute renal failure, postpartum complications, and need for blood transfusions. Neonatal thrombocytopenia is also more common in these pregnancies. Studies show that the severity of thrombocytopenia increases with worsening pregnancy-induced hypertension (PIH), and coagulation abnormalities such as prolonged PT and APTT may occur, especially in severe disease or DIC. [6-9]

Immune thrombocytopenic purpura (ITP) is an autoimmune disorder characterized by antibody-mediated destruction of platelets, often diagnosed by exclusion and clinical history of petechiae, purpura, or previous thrombocytopenia. Unlike gestational thrombocytopenia, ITP may occur early in pregnancy and can pose significant risks to both mother and fetus because maternal antibodies can cross the placenta and cause neonatal thrombocytopenia. Management may require active treatment including corticosteroids, intravenous immunoglobulin, platelet transfusion, immunosuppressive therapy, or plasma exchange depending on severity and bleeding risk. [10-13]

Pregnancy itself is a hypercoagulable state, and these coagulation changes may become exaggerated in preeclampsia and eclampsia, potentially leading to chronic DIC and organ damage involving the kidneys and placenta. Severe thrombocytopenia increases the risk of postpartum hemorrhage, neonatal asphyxia, operative delivery complications, and adverse neonatal outcomes. Therefore, differentiating gestational thrombocytopenia from pathological causes is essential. Moderate to severe thrombocytopenia requires careful evaluation, multidisciplinary management, and close maternal-fetal monitoring to reduce complications and improve pregnancy outcomes. [14-16]

Materials and Methods

The present observational study was conducted in the Department of Obstetrics and Gynaecology at Vardhman Mahavir Medical College and Safdarjung Hospital over a period of 18 months. Antenatal women beyond 20 weeks of gestation with persistent thrombocytopenia, defined as platelet count <1.5 lakh/mm³ on two occasions 24 hours apart, were included to compare fetomaternal outcomes between gestational thrombocytopenia and thrombocytopenia associated with hypertensive disorders of pregnancy. Sample size calculation was based on previous studies to detect a 15% difference in adverse fetomaternal outcomes, resulting in an estimated 152 patients per group with 80% power and 5% significance level. Women with transient thrombocytopenia, immune thrombocytopenic purpura, anemia-thrombocytopenia syndrome, drug-induced thrombocytopenia, and other secondary causes were excluded. Gestational thrombocytopenia was defined as third-trimester thrombocytopenia with spontaneous postpartum recovery, whereas HELLP syndrome was diagnosed by hemolysis, elevated liver enzymes, and platelet count <1 lakh/mm³. All patients underwent detailed clinical evaluation and investigations including urine examination, liver and kidney function tests, thyroid profile, blood sugar levels, blood pressure monitoring, and obstetric ultrasonography. Thrombocytopenia was categorized as mild, moderate, or severe based on platelet count. Maternal and fetal outcomes, transfusion requirements, and complications were monitored until discharge. Statistical analysis was performed using SPSS version 17.0, with $p<0.05$ considered statistically significant.

Results

Group A – Thrombocytopenia in Hypertensive Disorder of Pregnancy

Group B –Gestational Thrombocytopenia

Table 1: Distribution of Age in Patients in Group A and Group B

Age	Group A	Group B	Total
≤20 Years	6 (3.9%)	7 (4.6%)	13 (4.3%)
21–30 Years	117 (77.0%)	125 (82.2%)	242 (79.6%)
31–40 Years	28 (18.4%)	20 (13.2%)	48 (15.8%)
41–50 Years	1 (0.7%)	0 (0.0%)	1 (0.3%)
Total	152 (100.0%)	152 (100.0%)	304 (100.0%)

Table 2: Association of Parity in Group A and Group B

Parity	Group A	Group B	Total
Primigravida	66 (43.4%)	106 (69.7%)	172 (56.6%)
Multigravida	86 (56.6%)	46 (30.3%)	132 (43.4%)
Total	152 (100.0%)	152 (100.0%)	304 (100.0%)

Table 3: Association Between Gestational Age in Thrombocytopenia in Group A and Group B

POG	Group A	Group B	Total
<34 Weeks	8 (5.3%)	10 (6.6%)	18 (5.9%)
34–36+6 Weeks	37 (24.3%)	28 (18.4%)	65 (21.4%)
37–39+6 Weeks	86 (56.6%)	91 (59.9%)	177 (58.2%)
≥40 Weeks	21 (13.8%)	23 (15.1%)	44 (14.5%)
Total	152 (100.0%)	152 (100.0%)	304 (100.0%)

Table 4: Occurrence of APH in Thrombocytopenia in Group A and Group B

APH	Group A	Group B	Total
Yes	9 (5.9%)	11 (7.2%)	20 (6.6%)

Table 5: Variation in Platelet Count in Thrombocytopenia in Group A and Group B

Platelet Range	Less than 50k	50k–1 lakh	>1 lakh
Group A	9	132	11
Group B	8	112	32

Table 6: Incidence of Increased Bilirubin in Thrombocytopenia in Group A and Group B

Bilirubin >1.1	N
Group A	44
Group B	11

Table 7: Association of Deranged Liver Enzymes in Thrombocytopenia in Group A and Group B

Parameter	Group A	Group B
AST (N)	125	85
ALT (N)	142	117
ALP (N)	24	17

Table 8: Association of Deranged Creatinine in Thrombocytopenia in Group A and Group B

Creatinine	Group A	Group B
N	49	4

Table 9: Association of Deranged INR with Thrombocytopenia in Group A and Group B

INR	Group A	Group B
N	64	0

Table 10: Need of Transfusion in Thrombocytopenia in Group A and Group B

Transfusion	Group A	Group B	Total
Yes	31 (20.4%)	16 (10.5%)	47 (15.5%)

Table 11: Delivery Outcome in Thrombocytopenia in Group A and Group B

Delivery Mode	Group A	Group B	Total
Vaginal	66 (43.4%)	121 (79.6%)	187 (61.5%)
Induced	59 (38.8%)	14 (9.2%)	73 (24.0%)
LSCS	27 (17.8%)	17 (11.2%)	44 (14.5%)
Total	152 (100.0%)	152 (100.0%)	304 (100.0%)

Table 12: Occurrence of PPH in Thrombocytopenia in Group A and Group B

PPH	Group A	Group B	Total
Yes	20 (13.2%)	4 (2.6%)	24 (7.9%)

Table 13: Change in Platelet Counts in Thrombocytopenia in Group A and Group B

Change in Platelet Count	Group A	Group B	Total	χ^2	P-Value
Increase	96 (63.2%)	97 (63.8%)	193 (63.5%)	0.088	0.957

Table 14: Neonatal Outcomes in Thrombocytopenia in Group A and Group B

Neonatal Outcome	Group A	Group B	Total
Alive and Healthy	109 (71.7%)	126 (82.9%)	235 (77.3%)
NICU Admission	42 (25.7%)	26 (16.4%)	69 (22.7%)
Demise	4 (2.6%)	1 (0.7%)	5 (1.6%)
Total	152 (100.0%)	152 (100.0%)	304 (100.0%)

Table 15: Neonatal Thrombocytopenia as an Outcome in Thrombocytopenia in Group A and Group B

Neonatal Thrombocytopenia	Group A	Group B	Total
Yes	5 (3.3%)	3 (2.0%)	8 (2.6%)

Discussion

This study was conducted to evaluate fetomaternal outcomes in thrombocytopenia associated with hypertensive disorders of pregnancy and gestational thrombocytopenia. Pregnant women beyond 20 weeks gestation with persistent thrombocytopenia (<1.5 lakh/mm³) confirmed on two reports 24 hours apart were included. Patients with clinical signs of bleeding disorders such as petechiae, purpura, or bleeding tendency were excluded. A total of 152 hypertensive thrombocytopenic women (Group A) and 152 normotensive women with gestational thrombocytopenia (Group B) were enrolled and followed until maternal and neonatal discharge.

The mean age of patients was comparable in both groups, ranging between 27–31 years in Group A and 27–30 years in Group B, with the majority belonging to the 21–30 years age group. These findings were similar to the study by Habas E et al [9], where the mean age was 32.56 ± 1.5 years, with patients ranging from 18–49 years. Parity analysis showed that most women in Group A were primigravida, whereas multigravida women predominated in Group B. Similar observations were reported by Habas E et al[9], where most women were primigravida. However, the findings differed from Katke RD et al[17], who observed a more even distribution among gravida groups. Most patients in both groups presented at term gestation between 37–39.6 weeks, accounting for 56.6% in Group A and 59.9% in Group B. These findings were comparable to Ushida T et al [3], who reported maximum occurrence of gestational thrombocytopenia between 37–41 weeks, and Katke RD et al[17]. However, Singh J et al [18] reported higher presentation at earlier gestational ages of 29–36 weeks.

Placental abruption was observed in 6% of Group A and 7% of Group B patients, with no significant difference between groups. These findings were partly comparable to Mundkur A et al[20], who reported higher rates of abruption among patients with preeclampsia and HELLP syndrome, while gestational thrombocytopenia had minimal association with abruption. Moderate thrombocytopenia was the most common severity category in both groups. In Group A, 87% had moderate thrombocytopenia, while in Group B, 74% had moderate thrombocytopenia. Severe thrombocytopenia was less common in both groups. These findings were comparable to Vesna et al [8] and Katke RD et al.[17] However, the severity distribution differed from the findings of Mundkur A et al [20], who reported more severe thrombocytopenia in hypertensive disorders.

Deranged liver function tests were more commonly seen in Group A. Elevated bilirubin, AST, ALT, and alkaline phosphatase levels were predominantly associated with hypertensive thrombocytopenia. No direct comparison with previous studies could be made because of lack of available literature specifically correlating liver enzyme derangement with thrombocytopenia in pregnancy. Renal dysfunction was also more frequent in Group A, where 92% of patients with elevated creatinine belonged to hypertensive thrombocytopenia cases. Severe thrombocytopenia showed greater association with deranged renal function tests. These findings were comparable to Katke RD et al[17], who also reported significant association between severe thrombocytopenia and renal impairment. Coagulation abnormalities were predominantly observed in Group A, where many patients showed elevated INR values along with moderate to severe thrombocytopenia. These findings were similar to Haldar B et al[19], who demonstrated prolonged PT and APTT in severe preeclampsia and eclampsia patients, suggesting increased coagulation impairment in hypertensive thrombocytopenia.

Platelet transfusion was required more frequently in hypertensive thrombocytopenia, with 20.4% of Group A patients requiring transfusion compared to 10.5% in Group B. Similar findings were observed by Mundkur A et al[20], whereas Harde M et al [21] reported lower transfusion requirements overall. Most patients in both groups had vaginal deliveries, accounting for 82.2% in Group A and 88.2% in

Group B, while cesarean section rates were slightly higher in hypertensive thrombocytopenia. These findings were comparable to Katke RD et al[17] but differed from Mundkur A et al[20] and Singh J et al36, who reported higher cesarean section rates. Postpartum hemorrhage was more common in Group A (13.2%) compared to Group B (2.6%), showing increased bleeding risk in hypertensive thrombocytopenia. Similar findings were reported by Harde M et al [21], although rates differed from Rupakala BM et al [22]. Platelet counts improved postpartum in most patients, with approximately 63% of women in both groups showing increased platelet counts within 48 hours after delivery. Neonatal outcomes were generally favorable, though neonatal deaths and NICU admissions were more common in Group A. Neonatal thrombocytopenia occurred in 3.3% of Group A babies and 2% of Group B babies. These findings were comparable to Vishwekar PS et al[4] and Mundkur A et al[20], supporting that hypertensive thrombocytopenia is associated with comparatively poorer neonatal outcomes than gestational thrombocytopenia.

Conclusion

Gestational thrombocytopenia is generally a benign condition with favorable maternal and fetal outcomes and spontaneous postpartum recovery. In contrast, thrombocytopenia associated with hypertensive disorders of pregnancy is associated with increased maternal complications such as postpartum hemorrhage, coagulation abnormalities, liver and renal dysfunction, along with poorer neonatal outcomes. Early diagnosis, close monitoring, and multidisciplinary management are essential to improve fetomaternal outcomes in thrombocytopenic pregnancies.

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