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Original Research Article

Fetomaternal outcome of thrombocytopenia in pregnancy

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ABSTRACT

Background: Thrombocytopenia in pregnancy can result from multiple etiologies, some specific to pregnancy and others in non-pregnant settings. Platelet count below 1.5 lakh/cumm is called thrombocytopenia. It is the second most common haematological disorder in pregnancy. It affects nearly 6 to 15% of all pregnancies. To determine the causative factors of thrombocytopenia in pregnancy and to study maternal and fetal outcome of thrombocytopenia in pregnancy.
Method: This prospective observational study was conducted on 87 patients with platelet counts below the thrombocytopenic range at the tertiary care centre, ESIC MC AND PGIMSR Medical College and Hospital, from October 2023 to October 2024 and informed consent was obtained from all patients.
Results: Gestational thrombocytopenia is the most common cause of thrombocytopenia during pregnancy (50.5%) hypertensive disorder of pregnancy (20%) and intrahepatic cholestasis of pregnancy (8%). Most of the women were primigravida (37.9%) with term pregnancies (78%) and less than 30 years old (66.6%) with high incidence of mild thrombocytopenia (72.4%). Approximately, 5.7% patients required steroid therapy. In this study, the incidence of intrauterine death is 5.7%, neonatal mortality is 1.1% fetal growth restriction (20.6%) and neonatal thrombocytopenia is 4.5%.
Conclusion: Careful blood pressure monitoring and a complete hemogram would suffice for the early detection of the disease. Proper antenatal care and institutional deliveries enable obstetricians to diagnose thrombocytopenia and its complications at an early stage. Careful surveillance is required for these women in high-risk units for early detection and treatment to reduce adverse maternal and neonatal outcomes. Platelet count to be monitored periodically.

Keywords: Platelets, Gestational thrombocytopenia, Pre eclampsia

INTRODUCTION

Thrombocytopenia in pregnancy can result from multiple aetiologies, some specific to pregnancy and others in non-pregnant settings.[1] Platelet count below 1.5 lakh/Cumm is called thrombocytopenia. It is the second most common haematological disorder in pregnancy. It affects nearly 6 to 15% of all pregnancies.

Classification of thrombocytopenia in pregnancy is similar to non-pregnant patients.[2] Mild thrombocytopenia is 100,000-150,000/µl. Moderate thrombocytopenia is 50,000-100,000/µl. Severe thrombocytopenia is <50,000/µl. Normal pregnancy is associated with a physiological drop in the blood platelet count. The reason for this decline remains unknown. Decreased platelet production or increased platelet turnover occurs during pregnancy.[1]

Pregnancy-specific causes of thrombocytopenia include gestational thrombocytopenia, eclampsia, eclampsia, hypertensive pregnancy disorders such as HELLP syndrome, and liver diseases such as acute fatty liver during pregnancy.[3] Non-pregnancy-specific causes include immune thrombocytopenia autoimmune diseases such as SLE and APLA viral infections such as HIV, CMV, and EBV drug-induced thrombocytopenia thrombotic microangiopathy; and hereditary

thrombocytopenia. The most common cause is gestational thrombocytopenia, which accounts for approximately 70% of cases.[4] Hypertensive diseases, such as preeclampsia, eclampsia, and HELLP syndrome, account for 21% of all cases.

Immune mediated thrombocytopenia, including idiopathic thrombocytopenic purpura, accounts for 4.1% of cases and is relatively rare.[5] However, these conditions can lead to significant morbidity and mortality. Thrombocytopenia can have a wide range of prognoses, from completely benign to life threatening. This study focuses on the aetiology and maternal and neonatal outcomes of thrombocytopenia in pregnant women admitted to our tertiary care hospital.

Aim and objectives

This study aimed to estimate to determine the causative factors of thrombocytopenia in pregnancy and to study maternal and fetal outcome of thrombocytopenia in pregnancy.

METHODS

Study design

This was a prospective observational study.

Study population

The study population includes pregnant women.

Study period

The study period was of 1 year from October 2023 till October 2024.

Study duration

The study duration was of 12 months.

Study place

The study was done at ESIC-MC & PGIMSR, Rajajinagar, Bengaluru.

Sample size

As per the study conducted by Singh et al in 2020 reported that 6% were found to be having gestational thrombocytopenia. At 5% level of significance and absolute allowable error of 5% estimated sample size is 87. Sample size is calculated using (Zalpha/2)2×pq÷ r 2.

Inclusion criteria

Pregnant women with platelet count less than 1.5 Lakhs. Women who are willing to participate in the study.

Exclusion criteria

Women who are not willing to participate in the study. Pregnant women with thrombotic disorders. Pregnant women on anti-thrombotic & anti-platelet therapy.

After obtaining approval and clearance from the institutional ethics committee, the pregnant women fulfilling the inclusion criteria will be enrolled for the study after informing and obtaining informed consent.

Collecting data regarding the demographic profile, clinical history, past obstetrical, medical, surgical, family, social history and gestational age at the time of diagnosis.

Correlating clinical findings with laboratory and ultrasound findings and discovering causative factors. Maternal outcome studied by collecting data regarding the need for steroid therapy, mode of delivery, postpartum complications, associated comorbidities and need for platelet transfusion.

Fetal outcome studied by collecting data regarding neonatal thrombocytopenia IUGR, IUD, need for NICU admission and need for platelet transfusion.

RESULTS

The age group of 20-29 years had 58 patients (66.6%), the second most common was the age group range 30-40 years with 28 patients (32.1%), and the least common was >40 years with 1 patient only (1.1%).

Most of the mothers were primi gravida 33 patients (37.9%), the second most common being G2P1L1 with 26 patients (29.8%), while G2A1 was present in 9 patients (10.3%) and G3P2L2 (3 patients, 3.4%), and the least common obstetric code was G6P5L5 (one patient (1.1%).

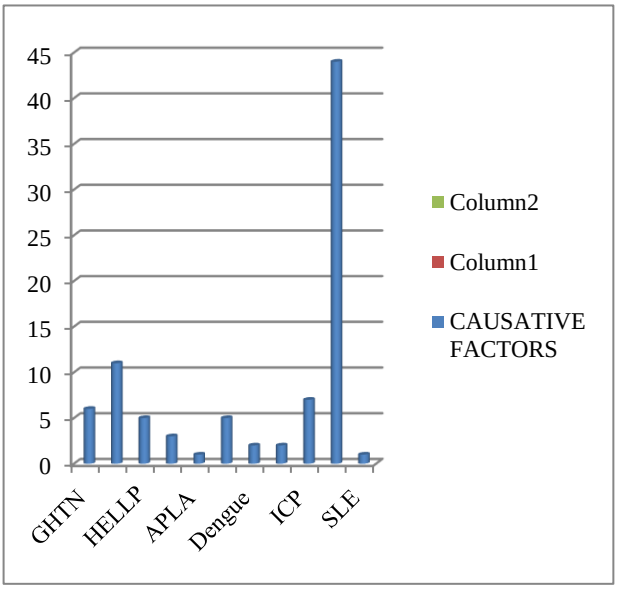

Figure 1: Causative factors.

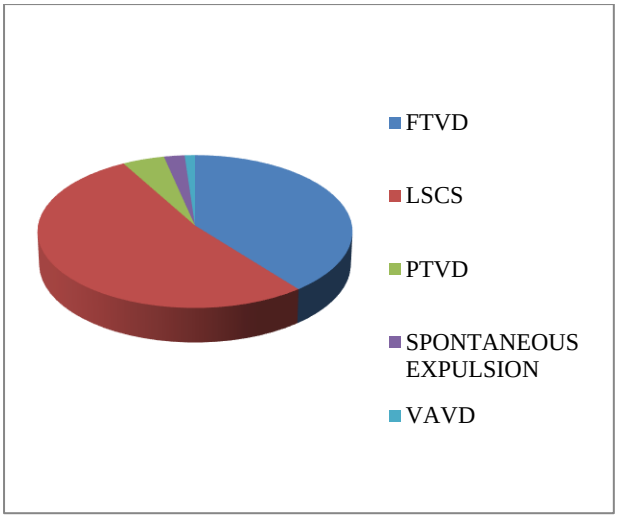

Figure 2: Mode of delivery.

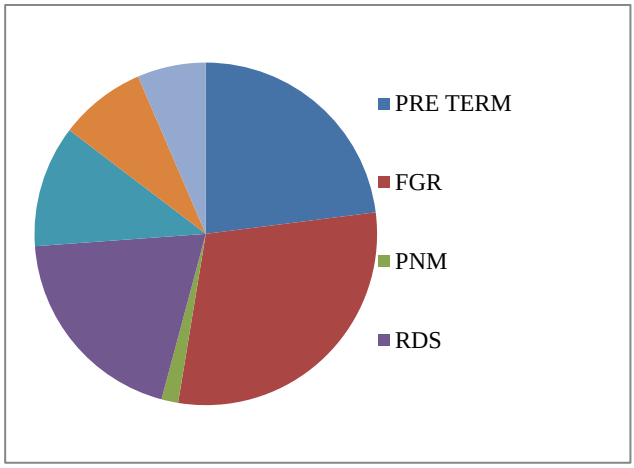

Figure 3: Neonatal Outcome.

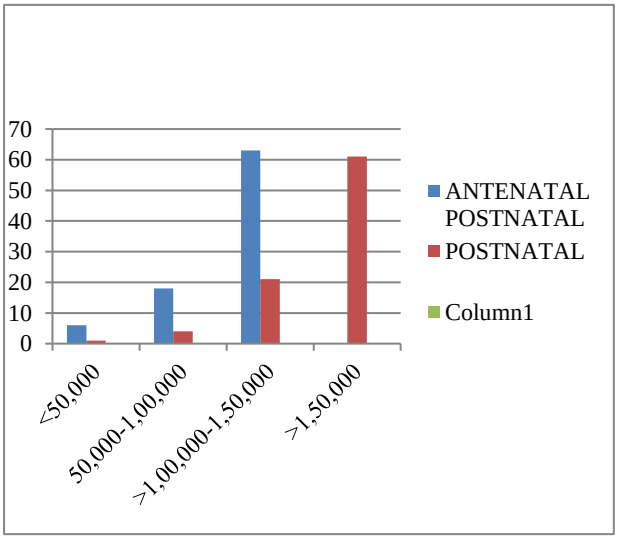

Figure 4: Comparison of antenatal and postnatal platelet count.

Only 3 patients in the entire study group had thrombocytopenia in a previous pregnancy (3.4%). The most prevalent comorbidity was hypothyroidism in 17 patients, anemia (7), GDM (6), asthma (2) and SLE (1).

Only the least common incidence of solitary patient count was seen in cases of DCLD/portal hypertension/moderate splenomegaly, protein C and S deficiency, GDM, Overt DM, SLE, and TB cervical lymphadenopathy.

Most of the patients were diagnosed with thrombocytopenia after 28 weeks (83 patients –95.4%). Splenomegaly was observed in 5 patients. Viral infection and immune factors were found in 7 cases. GHTN and DIC were found in 2 cases and ITP in 3 cases. HELLP, abruptio placenta, and liver disorders were each present in 5 cases.

Drug/transfusion induced and congenital causes were not found in any case. Most patients had normal ultrasound findings. As an indicator of thrombocytopenia, few (5) patients had splenomegaly, 3 had mild splenomegaly (3.4%), 2 had moderate splenomegaly (2.20%). Most of the patients had no specific complaints when few patients with specific complaints were considered, fever was present in 5 patients, three patients had bleeding gums.7 patients had anaemia and 3 had pancytopenia.

Most of the patients had a platelet count of > 1 lakh (63 patients, 72.4%), while the second most common was the range of 0.5-1 lakh (18 patients, 72.4%), and the least common range was <0.5, with 6 patients (6.8%). Only 7 patients had haemoglobin levels <10 (8%), while the remaining patients had a haemoglobin level >10 gm/ dl.

Only 5 patients were treated with steroids (5.7%) while the remaining patients did not. Five patients required platelet transfusion (5.7%), whereas the remaining patients had no such stances.

Most of the patients gave birth by normal delivery (33 patients, 37.9%), followed by LSCS (47 patients, 54%) and the next common being spontaneous expulsion (2 patients, 2.2%). The least common outcomes were VAVD and preterm delivery in one (1.10%) and four patient (4.50%), respectively.

When the pregnancy outcome concerned with the fate of the fetus is concerned, most of the deliveries were term pregnancies with 25 patients (28.7%),14 patients with preterm pregnancy (16%),18 patients with FGR (20.6%), and least common intrauterine death in 5 patients (5.7%) and perinatal mortality (1.1%).

Four of the total cases had neonates born with thrombocytopenia, while the others had no such neonates with thrombocytopenia. Of the two cases of neonatal thrombocytopenia, one neonate required platelet transfusion and the same neonate also had sepsis.

Table 1: demographic data of the study.

Demographic data		No. of patients	%
Age (in years)	<20	0	0
	20-29	58	66.6
	30-40	28	32.1
	>40	1	1.1
Obstetric code	Primi	33	37.9
	G2a1	9	10.3
	G2p1l1	26	29.8
	G3p2l2	3	3.4
	G3p1l1a1	9	10.3
	G5p1l1a3	3	3.4
	G3a2	3	3.4
	G6p5l5	1	1.1
Comorbidities	Gdm	6	3.4
	Chronic hypertension	1	1.1
	Overt diabetes	1	1.1
	Cardiac disease	1	1.1
	SLE	1	1.1
	Hypothyroidism	17	19.5
	Anemia	7	8
	Asthma	2	2.2
	DCDA	1	1.1
	Nil	51	58.6
Time of diagnosis	<14 weeks	0	0
	14 - 28 weeks	4	4.5
	>28 weeks	83	95.4
Ultra sonography	Mild splenomegaly	3	3.4
	Moderate splenomegaly	2	2.2
	Severe splenomegaly	0	0
Clinical findings	Fever	5	5.7
	Bleeding manifestations	3	3.4
	Non specific	79	90

Table 2: Maternal risk factors according to etiologies.

Maternal risk factors			
Causative factors	GHTN	6	6%
	Pre-eclampsia	11	12.6%
	HELLP	5	5.7%
	ITP	3	3.4%
	Apla	1	1.1%
	Abruption	5	5.7%
	Dengue	2	2.2%
	DIC	2	2.2%
	ICP	7	8%
	GTP	44	50.5%
	SLE	1	1.1%
Gestational age at the time of diagnosis	28-32 weeks	3	3.4%
	33-36 weeks	16	18.3%
	37-40 weeks	68	78%
History of thrombocytopenia in previous pregnancy		3	3.4%
Anemia	MCHC	4	4.5%
	Dimorphic	3	3.4%
Peripheral smear	Pancytopenia	3	3.4%

Table 3: maternal outcome among patients with thrombocytopenia in pregnancy.

		Total no of patients	%	Hypertensive etiology	ITP	GTP
Maternal outcome	FTVD	33	37.9	17 (19.5%)	1 (1.1%)	15 (17.2%)
	LSCS	47	50.5	28 (32.1%)	2 (2.2%)	17 (19.5%)
	PTVD	4	4.5	2 (2.2%)	1 (1.1%)	1 (1.1%)
	Spontaneous expulsion	2	2.2	2 (2.2%)	0	0
	Vavd	1	1.1	1 (1.1%)	0	0

Table 4: maternal complications according to etiologies.

	Total no of patients	%	Hypertensive etiology	ITP	GTP
PPH	28	32.1	14 (16%)	3 (3.4%)	11 (12.6%)
Abruption	5	5.7	3 (3.4%)	2 (2.2%)	0
DIC	2	2.2	1 (1.1%)	1 (1.1%)	0
ICU admission	2	2.2	1 (1.1%)	1 (1.1%)	0
Platelet transfusion	5	5.7	3 (3.4%)	2 (2.2%)	0
Steroid therapy	5	5.7	3 (3.4%)	2 (2.2%)	0
PRBC transfusion	2	2.2	1 (1.1%)	1 (1.1%)	0
FFP transfusion	4	4.5	2 (2.2%)	2 (2.2%)	0

Table 5: neonatal complications according to the etiologies.

		Total no of patients	%	Hypertensive etiology	ITP	GTP
Neonatal outcome	Pre term	14	16	11 (12.6%)	0	3 (3.4%)
	FGR	18	20.6	14 (16%)	1 (1.1%)	3 (3.4%)
	PNM	1	1.1	1 (1.1%)	0	0
	RDS	12	13.7	7 (8%)	0	5 (5.7%)
	NNHB	7	8	4 (4.5%)	0	3 (3.4%)
	IUD	5	5.7	3 (3.4%)	1 (1.1%)	1 (1.1%)
	Neonatal thrombocytopenia	4	4.5	3 (3.4%)	1 (1.1%)	0

DISCUSSION

Platelets are non-nucleated cellular fragments of megakaryocytes that play a critical role in haemostasis. Thrombocytopenia was defined as a blood platelet count of < 1,50,000/µl. It is the second leading cause of blood disorders during pregnancy after anaemia. It complicates 7%–10% of pregnancies. Owing to haemodilution secondary to the expansion of plasma volume, the platelet count in normal pregnancy may decrease by approximately 10%. Most of the decreases occurred during the third trimester.

In our study, the most patients are in the age group of 20-29 years (58 patients) (66.6%), the second most common was the age group range 30-40 years with 28 patients (32.1%), and the least common was >40 years with 1 patient only (1.1%). Most of the mothers were primi gravida 33 patients (37.9%) and the remaining are multigravidas. Because the difference was not significant, parity was not proven to be a risk factor for thrombocytopenia in our study. In our study, most deliveries were term pregnancies with 25 patients (28.7%),14 patients with preterm pregnancy (16%), 18 patients with FGR (20.6%), and least common Intrauterine death in 5 patients (5.7%) and perinatal mortality (1.1%).

As the difference was not significant, gestational age was not a risk factor for thrombocytopenia. In our study, 51 patients had no significant medical histories. A significantly more prevalent diagnosis was hypothyroidism in 17 patients. As hypertensive disorders of pregnancy are on a rising trend, more patients with gestational hypertension in our study belong to this category. In a study by Thanoon et al and Jalal et al, the overall incidence of thrombocytopenia during pregnancy was 8.6%. Gestational thrombocytopenia was the most common cause, accounting for 76.9% of the cases.[7] The results of this study were consistent with our findings. Burrows et al and Kelton et al conducted a prospective study for one year on a group of women who delivered at

McMaster University and demonstrated that gestational thrombocytopenia appears to have no adverse effects on the mother or foetus. Also, obstetrical interventions like caesarean sections because of thrombocytopenia are not justified in these mothers.[8] In a prospective study by Ruggeri et al, vaginal delivery was performed in of 33/41 (80%) patients, and of 8/41 (20%) underwent caesarean section for obstetrical reasons. Two patients underwent blood transfusions for postpartum haemorrhage. Neonatal bleeding did not occur during any delivery.[9] The results of these studies were consistent with our findings. After delivery, platelet counts (20.6% moderate thrombocytopenia to 4.5% and 6.8% severe thrombocytopenia to 1.1%) improved compared to platelet levels before delivery, and this improvement in the platelet count of the study sample was statistically significant.

This finding is consistent with Parnas et al, study where the platelet counts within 2–12 weeks after delivery. 9% of moderate thrombocytopenia after delivery in our study is found to be in ITP patients.[10] The platelet count of the infants after delivery was determined using cord blood samples. 4.5% of all infants had thrombocytopenia. There was no statistically significant correlation between the foetal platelet count and maternal count in our study. However, the mean platelet count was higher in babies born to mothers with moderate thrombocytopenia. Jenson et al. reported a link between maternal platelet counts and foetal platelet counts and found no significant correlation between the two.[11]

Thus, this feature is consistent with our study. Gestational thrombocytopenia had no adverse maternal or foetal outcomes. The platelet count was normal within 12 weeks of delivery. Even babies born to mothers had no adverse effects. There was no significant correlation between maternal and foetal platelet counts in the present study. This lack of association was by research by Hachisuga et al.[12]

As this is a prospective observational study, no intervention has been done. This study focused only on causative factors and outcome of thrombocytopenia in pregnancy. Intervention and management protocols are not studied in this group which is a major limitation of this study. As hypertensive disorders of pregnancy are on a rising trend, more patients with gestational hypertension in our study belong to this category which interferes with the outcome results.

CONCLUSION

Gestational thrombocytopenia is the most common cause of thrombocytopenia during pregnancy (50.5%), hypertensive disorder of pregnancy (20%) and intrahepatic cholestasis of pregnancy (8%). Patients with GTP and ITP have favorable maternal and perinatal outcomes. On the other hand, preeclampsia and HELLP syndrome are associated with adverse perinatal outcome like IUGR (30%) and stillbirths. Our study revealed a high incidence of mild thrombocytopenia. Thrombocytopenia in hypertensive disorders of pregnancy is primarily due to vascular endothelial ischaemia and hypoxia caused by vascular vasospasm.

Vascular viscosity increases with damaged endothelial cells, thereby increasing permeability, and accelerating platelet aggregation and consumption. Most pregnant women require timely termination of their pregnancy according to the obstetric situation, and this situation results in a high proportion of preterm births and caesarean sections. Careful blood pressure monitoring and a complete hemogram would suffice for the early detection of the disease. Platelet count to be monitored periodically. Proper antenatal care and institutional deliveries enable obstetricians to diagnose thrombocytopenia and its complications at an early stage and early intervention results in better outcome. Careful surveillance is required for these women in high-risk units for early detection and treatment to reduce adverse maternal and neonatal outcomes.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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