

Original Research Article

A PROSPECTIVE STUDY OF THROMBOCYTOPENIA IN PREGNANCY

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ABSTRACT

Background: Study done to evaluate incidence and outcome of thrombocytopenia in pregnant women.

Materials and Methods: This study was a hospital-based prospective observational research conducted over one year. The study included pregnant women who attended the antenatal clinic at the Department of Obstetrics and Gynecology. Blood samples were collected from all participants, and platelet counts were measured using both manual and automated methods. A total of 121 cases were selected based on their platelet counts at the time of admission for detailed analysis.

Results: Incidence of thrombocytopenia was 39.67% of the cases (48 cases). Obstetric causes are largely driven by hypertensive disorders, especially preeclampsia accounting for 15.70% of all cases (19 cases). Massive haemorrhage and pulmonary edema are among the most frequent morbidities, affecting around 9%–10% of cases each. These are critical complications that require prompt intervention. Perinatal outcomes reveal that while 50.41% of newborns had no morbidity, there is a concerning rate of complications such as FGR, birth asphyxia, and severe thrombocytopenia. The presence of stillbirth and intrauterine death, though lower in percentage, is still significant.

Conclusion: Gestational and obstetric causes of thrombocytopenia is the most common cause of thrombocytopenia during pregnancy, but other underlying causes must be considered as well. A thorough history and physical examination will rule out most causes.

Keywords: Hemolysis elevated liver enzymes and low platelets, Gestational thrombocytopenia, Thrombocytopenia in pregnancy.

INTRODUCTION

Thrombocytopenia refers to a condition where the blood has a lower than normal number of platelets, which are cells that help with blood clotting. Thrombocytopenia is considered with low platelet count less than 150,000 platelets per microliter of blood. This condition can increase the risk of bleeding and complicate health management. In pregnancy, thrombocytopenia is relatively frequent, affecting between 7% and 10% of pregnant women. It can be caused by several factors, including Gestational Thrombocytopenia which is most common form of the condition in pregnancy. It usually presents late in pregnancy and is often mild without posing significant risks. Preeclampsia or HELLP Syndrome are pregnancy complications involving high blood pressure and can lead to more

severe cases of thrombocytopenia.^[1,2] Immune Thrombocytopenic Purpura (ITP) which is autoimmune disorder that can cause a significant reduction in platelet count and requires closer monitoring. Other Causes as Infections, bone marrow disorders, or side effects from medications can also lead to low platelet counts during pregnancy.^[3] We study to aim on this condition in pregnancy generally seeks an overview of thrombocytopenia in general, its relevance in pregnancy, and existing research gaps. Examine the effects on both maternal and fetal outcomes, including assessing the risk of bleeding and any potential complications during delivery.

MATERIALS AND METHODS

This study was a hospital-based prospective observational research conducted over one year. The

study included pregnant women who attended the antenatal clinic at the Department of Obstetrics and Gynecology. Blood samples were collected from all participants, and platelet counts were measured using both manual and automated methods. A total of 121 cases were selected based on their platelet counts at the time of admission for detailed analysis.

Inclusion Criteria: All pregnant women attending the antenatal clinic with thrombocytopenia, women with a previous diagnosis of immune thrombocytopenic purpura (ITP) were also part of the study.

Exclusion Criteria: Women with conditions such as diabetes or thromboembolic disorders, whether pregnant or non-pregnant.

The study investigated 121 cases in detail, documenting information such as gestational age, potential risk factors, past medical history, and complications during both the current and any previous pregnancies. The study also looked at any history of symptoms like petechiae, bruising, medication usage, viral infections, or thrombocytopenia in previous pregnancies.

All participants underwent comprehensive general, systemic, and obstetric examinations. Routine blood tests were conducted to check parameters like hemoglobin (Hb), total leukocyte count (TLC), differential leukocyte count (DLC), bleeding time, clotting time, renal function tests (RFT), liver function tests (LFT), hepatitis B surface antigen (HBsAg), and HIV status. If the women had a fever, they were tested for Dengue IgM. Coagulation tests, including prothrombin time (PT), activated partial thromboplastin time (APTT), fibrin degradation products (FDP), and fibrinogen levels, were performed for those showing signs or symptoms of disseminated intravascular coagulation (DIC).

Blood samples were collected using sterile disposable syringes and needles from the antecubital vein, with minimal stasis. About 3 milliliters of blood was placed in EDTA tubes, labeled correctly, and

processed within 4 hours to ensure accurate results. The samples were kept at room temperature until they were analyzed.

Platelet counts were measured using both manual and automated hematology methods. The participants' presenting symptoms were documented, and they were monitored for any changes in platelet levels and the emergence of related symptoms. Complications during delivery, as well as maternal and fetal outcomes, were carefully recorded. For the maternal outcome, the mode of delivery and the postpartum period were closely observed. Regarding fetal outcomes, factors such as birth weight, the need for NICU admission, and early neonatal results were noted. Follow-up assessments were conducted to identify any complications in the newborn.

RESULTS

Most cases occur in the 33-36 Gestational age range. Severe and mild cases of Thrombocytopenia are almost equally represented, with moderate cases being less frequent.

Majority of patients fall into the 2nd-4th gravid group. [Table 1]

Gestational causes are the most common overall cause, representing 39.67% of the cases (48 cases). Obstetric causes are largely driven by hypertensive disorders, especially preeclampsia accounting for 15.70% of all cases (19 cases). Medical causes contribute notably through conditions like dengue and ITP, although the overall distribution of specific medical conditions is more varied. [Table 2]

The most frequent maternal morbidities are massive haemorrhage and pulmonary edema, Fetal growth issues and blood-related conditions like severe thrombocytopenia are prominent. The presence of stillbirth and intrauterine death, though lower in percentage, is still significant. [Table 34]

Table 1: Demographic and obstetrical profile

Parameters		No. of cases	Percentages
Gestational age (weeks)	29-32	35	28.93
	33-36	58	47.93
	37-40	28	23.14
Severity of thrombocytopenia	Mild	45	37.19
	Moderate	29	23.97
	Severe	47	38.84
Parity of patients	Primigravidae	47	38.84
	2nd -4th gravid	65	53.72
	>4th gravid	9	7.44

Table 2: Etiology of thrombocytopenia in pregnancy

Causes	No. of cases	Percentages
Gestational	48	39.67
Obstetrics	25	20.66
(a) Hypertensive disorders	22	18.18
Preeclampsia	19	15.70
Eclampsia	4	3.31
(b) DIC	3	2.48
Medical	25	20.66
(a) Hypersplenism	1	0.83

(b) Hepatic diseases	2	1.65
(c) Dengue	6	4.96
(d) Megaloblastic anaemia	1	0.83
(e) ITP	9	7.44

Table 3: Maternal and fetal outcome

Outcome		Cause	No. of cases	Percentages
Maternal	No morbidity	Nil	67	55.37
	Morbidity	Massive haemorrhage	11	9.09
		Puerperal sepsis	9	7.44
		ARF (renal failure)	8	6.61
		DIC	10	8.26
		Pulmonary edema	12	9.92
		Obstetrical hysterectomy	4	3.31
Perinatal	No morbidity	Nil	61	50.41
	Morbidity	FGR	14	11.57
		Birth asphyxia	11	9.09
		Severe thrombocytopenia	12	9.92
		ICH	7	5.79
		IUD	7	5.79
		Still birth	9	7.44

DISCUSSION

Thrombocytopenia affects approximately 7-10% of pregnant women, with causes ranging from benign (gestational thrombocytopenia) to severe (preeclampsia, HELLP syndrome, and autoimmune disorders like ITP). In present hospital-based prospective observational study most of the cases occur in 33-36 Gestational age range. Severe and mild cases of Thrombocytopenia are almost equally represented, with moderate cases being less frequent. Majority of patients fall into the 2nd-4th gravid group. A cohort study Lindqvist, P.G., et al.^[4]

conducted in Sweden found that gestational age at delivery had a significant impact on both maternal and perinatal outcomes, with the highest risks of complications occurring between 32-36 weeks gestation.

There have been several studies investigating gestational age, thrombocytopenia in pregnancy, and the impact of parity (number of previous pregnancies). Studies have shown that women in their second to fourth pregnancies (2nd-4th gravid) have a higher likelihood of experiencing certain complications compared to primigravidae (first-time mothers). This group may be at increased risk for conditions like gestational diabetes, hypertensive disorders, and thrombocytopenia, potentially due to cumulative changes in the body after multiple pregnancies. According to research, babies born during this window are at a higher risk for respiratory distress, infections, and jaundice compared to full-term infants. Studies suggest that pregnancy complications, particularly hypertensive disorders, tend to peak during this stage.^[3]

In present study thrombocytopenia with Gestational causes make up the largest proportion of cases at 39.67%, indicating that pregnancy-related conditions are a significant contributor to the overall case load. Obstetric causes contribute 20.66% to the total cases. Within this category, hypertensive disorders such as preeclampsia are particularly common, accounting

for 15.70% of all cases. Eclampsia, although less frequent, still contributes 3.31% of the total, indicating its presence as a notable but less frequent complication. Medical causes also represent 20.66% of cases, showing a significant role of non-pregnancy-related health conditions in the population. Gestational causes and obstetric complications, especially hypertensive disorders like preeclampsia, are the dominant factors. Burrows, R.F. et al,^[5] showed thrombocytopenia during pregnancy is a common gestational condition, affecting about 7-10% of pregnancies. It is often mild, but severe cases are linked to complications like HELLP syndrome, preeclampsia, and other hypertensive disorders. A prospective study of 6,715 deliveries found that gestational thrombocytopenia accounted for the largest proportion of cases (approximately 74%), while more severe forms, including preeclampsia-related thrombocytopenia, made up 26%. A study conducted by Sibai et al,^[6] found that 15-20% of pregnancies complicated by preeclampsia also presented with low platelet counts, a hallmark of HELLP syndrome. Severe preeclampsia can result in serious complications like renal failure, pulmonary edema, DIC (disseminated intravascular coagulation), and maternal death if not managed effectively. Shehata N et al,^[7] prospectively studied different causes of thrombocytopenia in pregnancy with a large sample size. In her study, prevalence of GT among thrombocytopenia was found to be 73.6% and of preeclampsia/eclampsia/HELLP was 21%. Immune disorders of pregnancy accounted for 4.1% cases while other causes like DIC/ TTP accounted for 1.3% cases. Boehlen F et al,^[8] studied thrombocytopenia and again, and prevalence was reported as 11% and 6-11% respectively with GT being the most common cause. In study by Sanio S et al,^[9] prevalence was found to be 7.3%. Karim R et al, reported that thrombocytopenia was observed in 7% to 10% pregnancies. According to the study by Mc Crae KR et al,^[10] thrombocytopenia affects 6-10% of all

pregnant females. Singh N et al, reported prevalence of thrombocytopenia in pregnancy as 8.8%. 7 GT was seen in 64.2% cases, obstetric causes were found in 22.1% cases and medical causes in 13.68% cases. Hypertensive and hepatic disorders were the most common obstetric causes of thrombocytopenia. Parnas M et al,^[11] reported the main causes of thrombocytopenia as gestational thrombocytopenia (59.3%), ITP (11.05%), preeclampsia (10.05%), and HELLP syndrome (12.06%). Khellaf M et al,^[12] reported that occurrence of thrombocytopenia during pregnancy is frequent and is around 10% and GT dominates among all causes of thrombocytopenia in pregnancy. Brown, M.A., et al,^[13] showed gestational hypertension can progress to preeclampsia, with approximately 25% of patients developing preeclampsia, significantly increasing the risk of maternal and fetal complications. Weinstein, L,^[14] retrospective analysis of 442 cases of HELLP syndrome found that the majority of patients developed severe thrombocytopenia and required intensive care, with a high incidence of maternal morbidity and preterm deliveries. There is a wide range of causes, indicating a complex and varied healthcare challenge in managing both pregnancy-related and non-pregnancy-related conditions. This shows the need for comprehensive maternal healthcare services to manage both obstetric complications and associated medical conditions. In our study more than half of the patients (55.37%) experienced no morbidity, indicating successful management for a majority. Massive haemorrhage and pulmonary edema are among the most frequent morbidities, affecting around 9%–10% of cases each. These are critical complications that require prompt intervention. Other morbidities like puerperal sepsis, acute renal failure (ARF), DIC, and obstetrical hysterectomy account for 3% to 8% of the cases, all indicating severe maternal complications in a smaller fraction of the sample. According to study conducted by Amita D.^[15] Incidence of PPH was 9.89% among cases. PPH was seen in 30% of medical, 15% of obstetric and only 4.92% of gestational thrombocytopenia. Incidence was significantly higher in medical thrombocytopenia ($p=0.008$). Three cases of obstetric and two of medical thrombocytopenia died during the study giving a mortality rate of 5.26%. Significantly higher mortality ($p=0.009$) was seen in these cases as compared to GT that showed nil mortality. Perinatal outcomes reveal that while 50.41% of newborns had no morbidity, there is a concerning rate of complications such as FGR, birth asphyxia, and severe thrombocytopenia, which can have long-term effects on infant health. Perinatal mortality, particularly stillbirth and IUD, is also a significant concern, suggesting that certain complications pose a substantial risk to fetal survival. Fetal growth issues and blood-related conditions like severe thrombocytopenia are prominent, indicating the importance of close monitoring during pregnancy to mitigate risks. The presence of stillbirth and

intrauterine death, though lower in percentage, is still significant and represents a serious challenge in managing high-risk pregnancies. Haram, K., et al,^[16] showed Fetal Growth Restriction (FGR) and birth asphyxia are more common in pregnancies complicated by maternal thrombocytopenia, especially when associated with hypertensive disorders like preeclampsia. Studies suggest that severe thrombocytopenia in mothers can increase the risk of poor perinatal outcomes, including low birth weight, preterm delivery, and stillbirth. According to study conducted by Amita D.^[15] Incidence of PPH was 9.89% among cases. PPH was seen in 30% of medical, 15% of obstetric and only 4.92% of gestational thrombocytopenia. Incidence was significantly higher in medical thrombocytopenia ($p=0.008$). Three cases of obstetric and two of medical thrombocytopenia died during the study giving a mortality rate of 5.26%. Significantly higher mortality ($p=0.009$) was seen in these cases as compared to GT that showed nil mortality.

In this study perinatal morbidity was present in 41 patients (45.56%). The perinatal complications include fetal growth restriction in 10 patients (11.1%), birth asphyxia in 9 patients (10%), severe thrombocytopenia in 9 patients (10%), ICH in 4 cases (4.4%). In this study 9 patients had perinatal mortality in which 4 cases had IUD and 5 cases had stillbirth. Neonatal complications are not directly related to maternal platelet count. The fetal complications occur in cases of preterm delivery, abruption, thrombocytopenia associated with anemia, sepsis. According to study conducted by Singh N,^[17] out of the 91 newborns, platelet count assessment could be done in 75 (81.4%). All had normal platelet counts at birth except the one born to mother with ITP. Neonatal thrombocytopenia of 65,000 cumm on day-1 returned to normal on day eight. None of the babies had any bleeding complications. In this study 40% cases had severe thrombocytopenia and 10% babies had severe thrombocytopenia. Gestational thrombocytopenia does not adversely affect maternal and fetal outcome. Study findings were similar to study conducted by Kamphuis et al,^[18] Samuels,^[19] evaluated 162 pregnant women and their infants with thrombocytopenia, 74 with presumed GT. No infant from a GT gravida had a platelet count $<50,000/\mu\text{L}$ or intracranial haemorrhage. In Burrows' study 756 of 1027 women, who were thrombocytopenic (73.6%) had GT. Only 1 infant had a platelet count $<50,000/\mu\text{L}$ and this infant had trisomy 21 and congenital bone marrow dysfunction. He concluded that GT is the most frequent type of thrombocytopenia and poses no apparent risks for either the mother or infant.

CONCLUSION

Gestational thrombocytopenia is the most frequent cause of low platelet count during pregnancy, but it is essential to evaluate other potential causes as well.

Conducting a comprehensive medical history and physical examination can help eliminate most causes. Additionally, reviewing the complete blood count (CBC) and blood smear is necessary to exclude conditions like pancytopenia and pseudothrombocytopenia caused by platelet clumping.

There is a noted association between thrombocytopenia and negative outcomes for both the mother and the fetus. As a result, it is important to regularly monitor platelet levels. Adequate prenatal care and delivery in a medical facility can help healthcare providers detect thrombocytopenia and its complications early on, allowing for timely interventions that can improve outcomes.

Further research is needed to identify and screen high-risk populations with thrombocytopenia, which will aid in developing effective screening and management strategies.

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