

A Study on Thrombocytopenia in Pregnancy and Feto-Maternal Outcome in Tertiary Care Centre

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Abstract: *Thrombocytopenia, a blood platelet count below 150,000/mm³, is the second most common hematologic disorder during pregnancy after anemia, affecting 7–11% of pregnancies. This study examines the maternal and neonatal outcomes of thrombocytopenia cases in pregnancy, including its causes and management. The most frequent cause identified was gestational thrombocytopenia, followed by hypertensive disorders such as preeclampsia, eclampsia, and HELLP syndrome. A retrospective analysis of 120 cases was conducted at Government Medical College, Miraj, Maharashtra. Results showed mild thrombocytopenia in 48% of cases, moderate in 36%, and severe in 16%. Vaginal deliveries occurred in 62% of mild cases and 58% of severe cases, while cesarean sections were more common in moderate and severe cases. Maternal complications included disseminated intravascular coagulation and acute kidney injury, and neonatal outcomes varied, with 37% requiring NICU admission. The study emphasizes the importance of timely diagnosis and multidisciplinary management to mitigate risks associated with thrombocytopenia during pregnancy.*

Keywords: Thrombocytopenia in pregnancy, maternal outcomes, neonatal outcomes, gestational thrombocytopenia, hypertensive disorders in pregnancy

1. Introduction

Thrombocytopenia, defined as blood platelet count below 150,000/mm³, is the second leading cause of blood disorders in pregnancy after anemia. It complicates 7 to 10% of all pregnancies. There is a physiological decrease in platelet count during normal pregnancy due to hemodilution, increased consumption in peripheral tissue and increased aggregation (higher levels of thromboxane A₂). The physiological thrombocytopenia of pregnancy is mild and has no adverse effects for the mother and fetus. By contrast, a significant thrombocytopenia associated with medical conditions can have serious maternal-fetal consequences and require specific monitoring and appropriate treatment. Thrombocytopenia in pregnancy is classified as Mild thrombocytopenia: 1 to 1.5 lakh per ml, Moderate Thrombocytopenia: 0.5 to 1 lakh per ml, Severe thrombocytopenia: <50,000 per ml.

Thrombocytopenia in pregnancy occurs either due to obstetric conditions (like gestational thrombocytopenia, preeclampsia/ eclampsia) or secondary to systemic disorders (like thrombocytopenic thrombotic purpura, immune thrombocytopenia). Gestational Thrombocytopenia accounts for 50% of all cases of thrombocytopenia in pregnancy.

Hypertensive disorders accounts for 30% of cases and non-obstetric causes (including immune thrombocytopenic purpura, Atonic PPH, Infective causes including DENGUE, SLE) corresponds to 20% of thrombocytopenia in pregnancy.

Thrombocytopenia (platelet count < 1.5 lac/mm³) is found in approximately of 20% of all cases during pregnancy and it may be due to hemodilution, increased consumption of platelets due to abnormal activation of the coagulation system or hormonal inhibition of megakaryocytopoiesis. Gestational thrombocytopenia or thrombocytopenia during pregnancy occurs in late gestation and is commonly mild, and resolves after delivery. Several studies have reported thrombocytopenia in 4–13% of neonates of GT's mothers. Gestational Thrombocytopenia is a benign condition and

severe thrombocytopenia rarely occurs. Thrombo-cytopenia can also be due to idiopathic thrombocytopenic purpura (ITP) which occurs due to formation of autoantibodies. ITP is usually severe during pregnancy and severe thrombocytopenia may occur in 5–10% of neonates of mothers with ITP. It generally improves after delivery. In pre-eclampsia, usually thrombocytopenia is mild to moderate but patients with eclampsia can develop severe thrombocytopenia and are more likely to have HELLP (Hemolysis, Elevated Liver enzymes, Low Platelet count) syndrome. Systemic lupus erythematosus (SLE) is one of the common causes of thrombocytopenia in pregnancy. Approximately 25% of patients with systemic lupus erythematosus (SLE) develop thrombocytopenia secondary to platelet destruction due to antiplatelet antibodies, circulating immune complexes or other causes. Fetal outcome of all these patients was studied by APGAR score and NICU admission.

Objectives

To study the maternal and neonatal outcome and to study causes of thrombocytopenia in pregnancy and the management of moderate to severe cases of thrombocytopenia.

2. Methods

We present a retrospective analysis of series of antenatal patients with thrombocytopenia in government Medical college, MIRAJ, Maharashtra; with an objective of evaluation of the etiology and outcome of patients. This study helps to stimulate more research in our population and to develop institutional guidelines. Data was extracted from patients' medical records, hospital computerized databases. The sample was calculated on the basis of the Cochrane formula (4 pq/lit sq) on the basis that thrombocytopenia in pregnancy affects 7–11% of pregnancies.¹ Patients were selected by the convenient sampling method. Verification done that each woman was represented only once in the dataset. Data was entered in a systematic manner in Microsoft Office excel and results were analyzed with

software Microsoft Office excel. Among obstetric causes of thrombocytopenia, gestational thrombocytopenia is the leading cause. Among non obstetric causes immune thrombocytopenic purpura and dengue were the leading causes. Total number of deliveries in the study period were 3319. Number of patients included in the study were 120.

All required investigation like hemogram, blood grouping, Rh typing, coagulation profile, serology, urine routine and microscopy, liver function test including enzymes, renal function test and ultrasound, were noted. Complete blood count of all patients noted, from it platelet count obtained. Platelet count less than 1.5 lakh were further evaluated in this study Cases were studied for the maternal and perinatal outcome. The outcome of the baby was studied by birth weight, APGAR score, NICU admission or perinatal mortality.

Inclusion criteria:

All the cases of thrombocytopenia in third trimester, admitted in obstetrics and gynecology department during study period and pregnant women with platelet count <1.5lakh were included.

Exclusion criteria:

All the antenatal women admitted in the ward of obstetrics and gynecology with platelet count more than 1 lakh/cubic cc.

3. Result

Incidence of thrombocytopenia in pregnancy irrespective of the cause is found to be 7-11%. Out of 3319 deliveries, 120 patients had platelets count less than 1 lakh cubic mm. While 80 patients delivered vaginally, 40 patients required caesarean section delivery (Table 1).

Table 1: Thrombocytopenia and Maternal outcome of the labour

Type of Thrombocytopenia	Normal Delivery	C-Section	Total
Mild	36	22	58
Moderate	29	14	43
Severe	11	8	19
Total	76	44	120

Of the 48% of mild thrombocytopenia patients, out of these 62 % delivered by vaginally and 38% by caesarean section. 36% of moderate thrombocytopenia, out of these 67% delivered by vaginally and 33% by caesarean section. 16% cases were severe thrombocytopenia, out of these 58% delivered by vaginally and 42% by caesarean section

Table 2: Etiology of Thrombocytopenia

Etiology	No. of Cases
Gestational Thrombocytopenia	60
Hypertention (preeclampsia/ecl ampsia/HELLP/Abruption)	40
AFLP	3
Atonic PPH	2
ITP/TTP	7
Bacterial/Viral (DENGUE)	4
Severe anemia (irrespective of pregnancy)	3
SLE	1

Total 50% out of 120 cases were gestational thrombocytopenia, 33% were cases associated with hypertensive disorders of pregnancy including pre-eclampsia, eclampsia, HELLP (Hemolysis elevated liver enzymes and low platelet count) syndrome, 2.5%cases were AFLP (Acute fatty liver of pregnancy), 1.5%cases were associated with atonic PPH, 6% cases were Idiopathic thrombocytopenic purpura (ITP), 3% cases were associated with viral and bacterial infection(including DENGUE), 3%cases were associated with Anemia (irrespective of pregnancy), 1% cases were associated with SLE.

Table 3: Thrombocytopenia Versus Neonatal outcome

Thrombocytopenia	NICU Admission	Motherside	Still Birth	IUD	Total
MILD	22	34	1	1	58
MODERATE	18	19	4	2	43
SEVERE	5	10	2	2	19
TOTAL	45	63	6	6	120

Out of 48% cases were mild thrombocytopenia, 38% needed for NICU admission, 58% didn't need NICU admission and 2% were stillbirth, 2% were IUD (intra uterine fetal demise). 36% cases were moderate thrombocytopenia, 42% needed for NICU admission, 44% didn't need NICU admission and 9%were stillbirth, 5%were IUD. 16% cases were severe thrombocytopenia, 26% needed for NICU admission, 52% didn't need NICU admission and 11% were stillbirth, 11% were IUD.

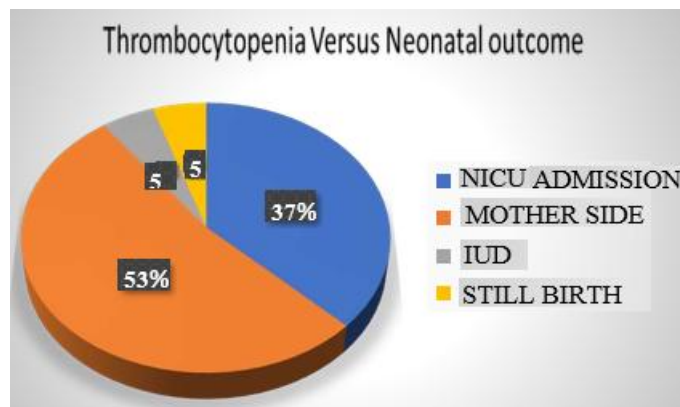


Table 4: Maternal complications

Maternal complications	No. of Cases
DIC	11
AKI	8
PPH	5
DEATH	4

Total 27Cases (23%) out of 120 cases were complicated by one or other way. 40% cases complicated by DIC, 19% cases were complicated by PPH, 30% cases were complicated by acute kidney injury, there were maternal deaths in 3 out of 120 cases (which corresponds to 11%)

4. Discussion

Thrombocytopenia is the second most common hematologic abnormality in pregnancy after anaemia.2 There is a physiological decrease in platelet count during pregnancy

due to haemodilution, increased consumption in peripheral tissue and increased aggregation (raised levels of thromboxane A2). The physiological thrombocytopenia of pregnancy is mild and has no adverse effects for the mother and foetus. By contrast, a significant thrombocytopenia associated with medical conditions can have serious maternal-fetal consequences and requires specific monitoring and appropriate management. In the authors' study 56.0% of patients underwent LSCS, 44.0% delivered vaginally. Gašparović et al and Ying Hsuan et al, found that thrombocytopenic women had a significantly higher rate of cesarean delivery as compared to their healthy peers, as, the neonates with severe thrombocytopenia may experience bleeding complications, especially intracranial hemorrhage, particularly as a consequence of head trauma during vaginal delivery. From a practical standpoint, the current guidelines consider that vaginal delivery is safe when platelet count is higher than 30.000/mcl. For operative vaginal or caesarean deliveries, the safe platelet count should be at least 50.000 platelets/mcl. The exact platelet number needed to achieve a safe epidural anaesthesia is debated, but in most guidelines, the reference value is around 75.000-80.000/mcl. There is a theoretical concern over the risk of epidural hematoma with lower platelet values. Spontaneous bleeding may occur with less than 20.000 platelets/mcl and the risk of internal bleeding is increased if the platelet count falls below 10.000/mcl. Thrombocytopenia in pregnancy happens secondary to many aetiologies, differing in their pathophysiology and presentation.

Gestational thrombocytopenia:

A study conducted by Parnas et al found that the main causes of TCP were gestational TCP (59.30%) while the results in the authors' study revealed to be 38%.¹³ It is diagnosed based on the following criteria. Onset in mid second to the third trimester, no symptoms in the mother and no history of bleeding, no effect on the outcome of the pregnancy, no thrombocytopenia in the neonate, self-limited course and resolution in 4 to 8 weeks. A tendency to recur with the same degree in subsequent pregnancies. Gestational thrombocytopenia is a diagnosis of exclusion which is based on a thorough history and physical exam and ruling out of conflicting diagnosis with lab support. Rarely, the platelet count drops below $70 \times 10^9/l$, then the patient should be evaluated for a secondary cause like ITP.

Pre-eclampsia/Eclampsia/HELLP Syndrome:

Patients present with severe hypertension after 20 weeks of gestation (defined as systolic pressure more than 160mmHg and diastolic pressure more than 110 mmHg on two separate occasions, at least 4 hours apart) or with severe persistent right upper quadrant epigastric pain which is unresponsive to medications. Eclampsia can present as a sequela to pre eclampsia with seizures. In a study conducted by Wang et al, the incidence of hypertensive disorders was 28.2%, while the results in the authors' study revealed to be 28% which is comparable. HELLP syndrome correlates with generalized edema in more than 50% of patients who demonstrate hepatic and renal insufficiency. A study conducted by Parnas et al, found that the causes of TCP due to HELLP syndrome observed in 12.06%, while the results of the authors' study revealed to be 5%.

AFLP:

Clinically, it is quite challenging to distinguish between AFLP and HELLP syndrome. However, encephalopathy, hypoglycemia, severe coagulopathy, along with TMA like hemolysis, are more frequently present in patients with AFLP.

Other etiologies are:

disseminated intravascular coagulation (DIC); and hereditary thrombocytopenia (HT) - further classify according to the size of the platelet, genetic defect and inheritance pattern (WAS gene, HOXA 11 gene, and MYH9 disorders). Others Bone marrow failure syndromes [aplastic anemia myelodysplastic syndrome (MDS), myeloproliferative neoplasms (MPN), and leukemia/lymphoma marrow infiltrative disorders. Paroxysmal nocturnal hemoglobinuria (PNH), Drug-induced thrombocytopenia, type IIB von Willebrand disease (VWD), heparin-induced thrombocytopenia (HIT)

Severity of Thrombocytopenia

In a prospective observational study done in the department of obstetrics and gynecology, VMMC and Safdarjung Hospital in New Delhi, India, 62% were having mild thrombocytopenia, 31% were in moderate thrombocytopenia group, and 7% were with severe thrombocytopenia. There was a more incidence of severe thrombocytopenia in our study when compared to this study. In a study conducted by Khatke et al in Mumbai at Sir JJ group of hospitals in 2014, 70.9% were with moderate thrombocytopenia and 29.1% were with severe thrombocytopenia.

Mode of Delivery

In a study at VMMC and Safdarjung Hospital in New Delhi, India it has been found that around 94% patients delivered vaginally; among these, 9 patients had instrumental delivery. Study conducted by Nisha et al, normal deliveries were in 61.54% and cesarean section done in 32.26% patients.⁸ Thrombocytopenia in pregnancy nearing term by Harde et al 54.7% patients delivered vaginally, and 45.3% by cesarean section.

Maternal Complications

In a study of prevalence of thrombocytopenia during pregnancy and its effect on pregnancy and neonatal outcome by Arora et al at Guru Gobind Singh Medical College, Faridkot, in 2016 found placental abruption in 6.6%, PPH in 4.3%. In Sibai et al study maternal mortality was 1.1%, acute renal failure was reported in 7.4% of patients. Nisha et al study observed higher incidence of PPH (9.89%), 5.33% of maternal mortality.

Neonatal Complications

Among 37% babies admitted in NICU, include LBW, VLBW, RDS, TTN, HBsAg positive mother, jaundice, cardiac anomaly and, 5% were stillbirth and 5% cases were IUD. Among this 10% babies dead after admission. In a study of prevalence of thrombocytopenia during pregnancy and its effect on pregnancy and neonatal outcome by Arora, et al at Guru Gobind Singh Medical College, Faridkot, in 2016 showed stillbirth in 8%, low birth weight in 10.21%, low APGAR in 16.2% babies.

5. Conclusion

Thrombocytopenia is being detected more often during routine investigation like complete blood count. The most common cause of thrombocytopenia being gestational thrombocytopenia and next being hypertensive disorders complicating pregnancy. Thrombocytopenia in pregnancy induced hypertension carries a risk for both the mother and her foetus. The associated causes like abruption, intrauterine fetal death, disseminated intravascular coagulation aggravates the complication for thrombocytopenia. Mild thrombocytopenia was more common in third trimester and more often gestational thrombocytopenia. Despite pregnancy, NICU thrombocytopenia admission was infrequent. Thrombocytopenia in pregnancy if timely diagnosed do not cause any mortality, however management of these patients require a multidisciplinary approach and close collaboration between obstetrician, physician, and neonatologist.

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