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A study of causes of thrombocytopenia in pregnancy and its effect on maternal outcome

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Abstract: Background: Pregnancy is associated with numerous physiological and pathological changes. Thrombocytopenia, defined as a platelet count of less than 150,000/μL, is the second most common hematological finding in pregnancy after anemia. It may manifest during pregnancy and increase the risk of bleeding.

Materials & Methods: This prospective observational study was carried out in the Antenatal outpatient and inpatient Department of Gynecology and Obstetrics at Bharati Vidyapeeth Medical College and Hospital, Sangli. All pregnant women diagnosed with thrombocytopenia during the six-month study period were included. Patients were followed until delivery to record any complications such as preterm labor, abruption, preeclampsia, postpartum hemorrhage, or any other morbidities, and to determine maternal outcomes.

Results: Out of 246 pregnant patients, 30 were found to have thrombocytopenia with a platelet count of 150,000/mm^3 or below, giving a prevalence of approximately 12%. The cases were recorded based on demographic characteristics, gestational age at the time of first onset of thrombocytopenia, severity of thrombocytopenia, and any intervention. Maternal outcomes were recorded.

Conclusion: Gestational thrombocytopenia is the most common cause of thrombocytopenia during pregnancy and has good maternal outcomes. Managing pregnant women with platelet disorders requires a multidisciplinary approach and close collaboration between obstetricians and hematologists.

Keywords: Anemia; Platelets; Pregnancy; Thrombocytopenia.

1. Introduction

Thrombocytopenia is the second most common hematologic abnormality during pregnancy, after anemia [1]. It is defined as a platelet count of less than 150,000/μL. Mild thrombocytopenia is present when the platelet count is between 100,000-150,000/μL, moderate when it is between 50,000-100,000/μL, and severe when it is less than 50,000/μL [2]. The incidence of thrombocytopenia during pregnancy is 8%, with gestational thrombocytopenia being the most common cause, accounting for almost 70% of all cases. Due to hemodilution secondary to expansion of plasma volume, the platelet count in normal pregnancies may decrease by approximately 10%, with most of this decrease occurring during the third trimester [3]. Hypertensive disorders, such as pre-eclampsia and HELLP (Hemolysis, elevated liver enzymes, and low platelet count) syndrome, account for 21% of cases [4]. Immune-mediated thrombocytopenia, including idiopathic thrombocytopenia purpura, is responsible for 4.1

Spontaneous bleeding may occur when the platelet count falls below 20,000/μL, and the risk of internal bleeding increases if the count falls below 10,000/μL [6]. Idiopathic thrombocytopenic purpura (ITP) is an autoimmune disorder characterized by the destruction of circulating antibody-bound platelets by the reticuloendothelial system, particularly in the spleen [7]. In pregnant cases, the antibody crosses the placenta, putting the infant at risk of thrombocytopenia [9]. The aim of the present study is to investigate the different causes of low platelets in pregnancy in our setting and determine their relationship with maternal outcomes.

2. Aims and Objectives

2.1. Aim

To study the causes of thrombocytopenia in pregnancy and their effect on maternal outcomes.

2.2. Objectives

1. To study the various causes associated with thrombocytopenia in pregnancy.
2. To determine the maternal outcomes in pregnancies associated with thrombocytopenia.

3. Materials and Methods

This is a prospective observational study conducted in the antenatal outpatient and inpatient departments of the Department of Gynecology and Obstetrics in our tertiary care hospital.

All pregnant women, regardless of parity and gestational age, who were diagnosed with thrombocytopenia during pregnancy within a 6-month period were included in the study. Pregnant women with known hematological or thromboembolic disorders were excluded.

Detailed menstrual and obstetric history was taken, and a thorough general physical and obstetric examination was conducted. Gestational age was established through menstrual history and clinical examination, and confirmed by obstetric ultrasonography.

All routine investigations, including platelet count estimation, coagulation profile (PT/INR, aPTT, BT/CT), peripheral blood smear, dengue IgG and IgM antibodies, liver function test, renal function test, and obstetric ultrasonography, were performed to determine the causes of thrombocytopenia.

Women with normal platelet counts before 28 weeks had a repeat platelet count in the third trimester to detect gestational thrombocytopenia.

All cases were followed until delivery to record any complications such as preterm labor, abruption, preeclampsia, postpartum hemorrhage, or any other morbidities, and to determine maternal outcomes. All information was collected and results were analyzed.

4. Results

During the study period, 30 out of 246 pregnant patients were found to have thrombocytopenia with a platelet count of 150,000/mm^3 or below, resulting in a prevalence of approximately 12

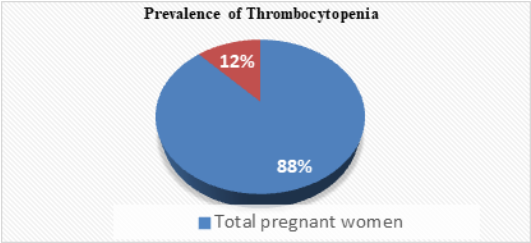

Figure 1. Prevalence of Thrombocytopenia

Table 1. Distribution of cases according to weeks of gestation

Weeks of gestation	No. of cases	Percentage (%)
<20	3	10
20-24	2	7
25-29	5	16
30-34	13	43
35-39	6	21
40 or more	1	3
TOTAL	30	

Table 1 presents the distribution of thrombocytopenia among pregnant women at different gestational weeks. The majority of cases of thrombocytopenia were observed in the third trimester, with 43% (13) cases in 30-34 weeks of gestation, 21% (6) cases in 35-39 weeks of gestation, and 3% (1) case in 40 weeks or later. In addition, 10% (3) cases were reported in less than 20 weeks of gestation, 7% (2) cases in 20-24 weeks of gestation, and 16% (5) cases in 25-29 weeks of gestation.

Table 2. Gravida distribution among patients

Gravida	NO. OF CASES	Perentage (%)
Primigravida	13	43
Second gravida	10	33
Multigravida	7	24

Table 2 presents the distribution of thrombocytopenia according to the parity of the patients. Of the total cases of thrombocytopenia, 43% (13) were primigravida, 33% (10) were second gravida, and 24% (7) were multigravida. Therefore, it can be concluded that parity does not have a significant influence on the occurrence of thrombocytopenia during pregnancy.

Table 3. Severity of thrombocytopenia among pregnant women

Platelet count	No. of cases	Percentage (%)
Mild (>1,00,000)	10	33
Moderate (50,000-1,00,000)	17	57
Severe (<50,000)	3	10
Total	30	

Table 3 shows the severity of thrombocytopenia among pregnant women. Mild thrombocytopenia was observed in 33% of cases (10), moderate thrombocytopenia in 57% of cases (17), and severe thrombocytopenia in 10% of cases (3). Most of the 30 pregnant women who had thrombocytopenia had moderate thrombocytopenia.

Table 4. Distribution of thrombocytopenia cases according to etiology

Etiology	No. of cases	Percentage (%)
Geastational thrombocytopenia	16	53
Hypertensive disorders	8	27
Hellp syndrome	2	7
Dengue	2	7
ITP	1	3
Multi organ failure	1	3

Table 4 presents the distribution of thrombocytopenia cases according to their etiology. Out of 40 cases of thrombocytopenia, the diagnoses included: 53% (16) cases of gestational thrombocytopenia, 27% (8) cases of hypertensive disorders of pregnancy, 7% (2) cases of HELLP syndrome, 7% (2) cases of dengue, 3% (1) case of immune thrombocytopenia (ITP), and 3% (1) case of multi-organ failure. (Note: HELLP syndrome is characterized by hemolysis, elevated liver enzymes, and low platelets, and ITP is immune thrombocytopenia.)

Table 5. Distribution of cases on the basis of treatment required

Treatment	No. of cases	Percentage(%)
Not required	15	50
Corticosteroids	7	23
Corticosteroids +IV immunoglobulins	1	3
IV immunoglobulins	1	3
Platelet transfusion	6	20

Table 5 shows the treatment modalities used for managing thrombocytopenia in pregnancy based on the severity and etiology. Out of the total 30 cases, 50% (15) did not require any treatment, 23% (7) cases required corticosteroids, 3% (1) case required a combination of corticosteroids and intravenous Immunoglobulins, and 3% (1) case required intravenous Immunoglobulins as they did not respond to corticosteroid therapy. In addition, 20% (6) cases with severe thrombocytopenia or bleeding required platelet transfusion.

Table 6. Maternal outcome

Outcome	No. of cases	Percentage(%)
Good outcome	22	73
Mortality	1	3
PPH	4	15
DIC	2	6
Others	1	3

Table 6 illustrates the maternal outcomes associated with thrombocytopenia in pregnancy. Of the 30 cases studied, 73% (22) had good maternal outcomes with no complications. However, 3% (1) of cases resulted in mortality due to serious complications related to thrombocytopenia. Additionally, 15% (4) of cases experienced postpartum hemorrhage (PPH), while 6% (2) of cases developed disseminated intravascular coagulation (DIC). Finally, 3% (1) of cases experienced other complications such as renal failure, liver failure, congestive cardiac failure, and so on.

5. Discussion

Thrombocytopenia is a common issue during pregnancy that is frequently underdiagnosed and mismanaged. This prospective study lasted 6 months and involved 246 pregnant women, 30 of whom had thrombocytopenia.

The prevalence of thrombocytopenia in this study was 12%, which is similar to the figure of 12.8% reported by Vijay et al. [12], but much higher than figures reported in other studies [3,11]. In this study, the majority of cases (43%) of thrombocytopenia were seen in weeks 30-34 of gestation, followed by 21% of cases in weeks 35-39. This is consistent with the report of Crowther et al., who found that gestational thrombocytopenia typically develops in the late second or third trimester [5]. However, this contrasts with the study conducted by Parnas et al., in which the maximum number of cases (74.4%) were in gestational age 37-40 weeks [13].

Of the 30 cases of thrombocytopenia in this study, mild thrombocytopenia was seen in 33% of cases, moderate thrombocytopenia in 57% of cases, and severe thrombocytopenia in 10% of cases. In a study conducted at Gondar University in Ethiopia by Asrie et al. in 2014 [8], 74% of cases were mild thrombocytopenia, 20.7% were moderate, and 5.3% were severe thrombocytopenia. In comparison, the incidence of moderate thrombocytopenia was higher in our study. In a study conducted by Khatke et al. [14] at Sir J.J Group of Hospitals in Mumbai in 2014, 70.9% had moderate thrombocytopenia and 29.1% had severe thrombocytopenia. Gestational thrombocytopenia was the most common etiological factor in this study, accounting for 53% of cases, followed by 27% for hypertensive disorders, 7% for HELLP syndrome, 7% for dengue, and 3% for ITP. In a study by Parnas M et al., the most important etiological factors for thrombocytopenia were gestational thrombocytopenia (59.3%) and hypertensive disorders (21.1%) [13]. In contrast, in an Indian study conducted by Harde et al. [10], the most common cause was preeclampsia (33.3%) and preeclampsia with HELLP syndrome (20.7%), followed by GT (28%), while infectious causes accounted for 12.7%.

In this study, 50% of cases did not require any treatment, as their platelet count was above 50,000/μL. Corticosteroids were started in 23% of cases, while immunoglobulin therapy was given to 3% of cases that were not responding to oral steroids. A combination of oral steroids and immunoglobulin therapy was given to 3% of cases, and platelet transfusion was given to 20% of cases with very low platelets or to patients with bleeding. In a study of the prevalence of thrombocytopenia during pregnancy and its effect on pregnancy and neonatal outcome conducted by Monica Arora and Lajja Goyal at Guru Gobind Singh Medical College in Faridkot, Punjab, in 2016 , Placental abruption 6.6%, PPH -4.3%, Wound hematoma- 3.6% were noted. When compared with this study, the occurrence of complications was more in our study. According to our study 27%

cases had complications which included: Maternal mortality in 3% cases, PPH in 15% cases, DIC in 6% cases and other complications like Liver failure, CCF, renal failure, sepsis in 3%.

6. Conclusion

Thrombocytopenia is a common problem during pregnancy that can have various causes. Gestational thrombocytopenia is the most frequent cause, followed by hypertensive disorders of pregnancy, with the majority of patients having good maternal outcomes.

Diagnosis depends on when the thrombocytopenia develops, the severity of the condition, and any associated abnormalities. Conducting a comprehensive medical history and regular antenatal checkups can facilitate early detection and prevent perinatal complications and maternal mortality.

Managing thrombocytopenia in pregnant women requires a multidisciplinary approach and close collaboration between obstetricians and hematologists.

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Conflicts of Interest: The authors declare that they have no conflicts of interest.

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