International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Vineetha A et al. Int J Reprod Contracept Obstet Gynecol. 2023 Nov;12(11):3373-3377
www.ijrcog.org
pISSN 2320-1770 | eISSN 2320-1789

DOI: https://dx.doi.org/10.18203/2320-1770.ijrcog20233312

Original Research Article

A study to evaluate prevalence of thrombocytopenia in antenatal patients

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Received: 23 September 2023
Revised: 15 October 2023
Accepted: 18 October 2023

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ABSTRACT

Background: Basically, thrombocytopenia is a hemorrhagic disorder that occurs as a result of reduced platelet counts and this study provides a concise over view about the challenges faced with the antenatals who suffer from thrombocytopenia and related issues. it usually results from various etiological factors which demand proper monitoring and timely management for better maternal and Fetal outcomes. this study focuses on the diagnosis of thromobocytopenia and the causes of it and also the effects.
Methods: Data are collected from both the antenatal women attending outpatient and inpatient department at obstetrics and gynecology department at Narayana Medical College and Hospital, Nellore with total platelet count less than 1,50,000/ul and then they are followed and the details regarding antenatal complications, intrapartum events and fetal outcome are collected from them.
Results: Present study showed that the definite increased risk of preeclampsia, eclampsia, anemia, hypothyroidism, gestational diabetes mellitus, chronic hypertension, overt diabetes, obesity, preterm labor, cesarean section rate, low birth weight babies in elderly primigravidas and anemia, hypothyroidism, preterm labour, low birth babies, NICU admission in teenage primigravidas compared with pregnant in the younger age group.
Conclusions: Timely identification and management of the cause of thrombocytopenia is crucial in the antenatal group of women. Most of the cases of thrombocytopenia are incidental findings with asymptomatic patients. Proper diagnosis and timely interventions are essential for better outcomes in antenatals with thrombocytopenia. gestational thrombocytopenia appears to be the most prevalent causes.

Keywords: Maternal and fetal outcomes, High risk groups, Reduced platelet counts

INTRODUCTION

Haematological disorders complicating pregnancy include anemia and thrombocytopenia. Thrombocytopenia in pregnancy is defined as platelet count of less than 150,000/µl. It is diagnosed more frequently in the last decade because platelet counts are included in the complete blood counts and it appears to be the second most common blood cell disorders after the prevalent anemia.[1]

In general, pregnancy is various physiological and pathological changes seen in the platelet counts and also its actions. platelet abnormalities may also be either qualitative or quantitative, which may be diagnosed with the signs of unusual bleeding. we may see a fall in the count of platelets during the third trimester which may be due to the physiological hemodilution or an increase in the aggregation.

Thrombocytopenia in pregnancy has various etiological factors with a wide range of spectrum varying from mild gestational thrombocytopenia to life threatening serious complications like HELLP syndrome. It may be inherited

or idiopathic, acute or chronic in onset, either primary or associated with other disorders.

A low platelet count is often an incidental feature of pregnancy, but it might also provide a biomarker of a coexisting systemic or gestational disorder and a potential reason for a maternal intervention or treatment that might pose harm to the fetus.

Common causes of thrombocytopenia in pregnancy are: gestational thrombocytopenia, immune thrombocytopenia, thrombotic thrombocytopenia, and preeclampsia and HELLP syndrome.

Gestational thrombocytopenia is a physiological condition in pregnancy, observed mainly in the third trimester occurring due to hemodilution and/or accelerated platelet turnover with increased platelet production in the marrow and increased trapping and destruction at the placental site.

Immune thrombocytopenic purpura is an autoimmune disorder that may occur in pregnancy and its severity can vary. the condition is generally characterized by mega thrombocytes. incidence is one per 1000 pregnancies. It is the most common cause of thrombocytopenia in the first trimester.[2]

Preeclampsia and HELLP syndrome

In cases of preeclampsia thrombocytopenia may be mild to moderate when compared to the patients of eclampsia who are prone to have a HELLP syndrome. The pathogenesis of thrombocytopenia in women with severe preeclampsia is unknown, although vascular endothelial damage, impaired prostacyclin production and increased deposition of fibrin within the vascular bed have been suggested. Accelerated platelet destruction, platelet activation, increased platelet volume and increased megakaryocyte production have been observed.

The HELLP (hemolysis, elevated liver enzymes, low platelets) syndrome, a component of severe pre-eclampsia, is characterized by microangiopathic anaemia, SGOT>70 units and thrombocytopenia (<100×109/l) and is associated with a maternal mortality of about 3.3%. Severe epigastric or right upper quadrant abdominal pain, which need not be associated by proteinuria and hypertension, are common symptoms. It is more common in multiparas, occurs in a slightly younger age group.[3]

Thrombotic thrombocytopenic purpura is characterised by microangiopathic haemolytic anaemia, thrombocytopenia, central neurological abnormalities, fever and renal dysfunction. In some series, up to 10% of all cases of TTP occurred in pregnant patients, and pregnancy is considered to be a predisposing factor for this disease.[4]

Other causes include: APLA syndrome, vitamin deficiencies mostly B12, HIV-AIDS complex, dengue infection, systemic lupus erythematosus, and acute fatty liver disease of pregnancy.

When the value of platelets falls below 70,000/ µl, a pathological cause is suspected. This study was aimed at early antenatal identification of thrombocytopenia and evaluate the risk factors involved. Prevention of maternal and fetal morbidity and mortality through timely diagnosis is the ultimate goal of the study.

Following shows the laboratory abnormalities demonstrating HELLP syndrome.

Haemolysis- abnormal peripheral smear was observed, total bilirubin was >1.2 mg/dl, lactic dehydrogenase was >600 u/l, elevated liver enzymes- aspartate aminotransferase >70 U/l, lactate dehydrogenase >600 U/l, and platelet count was low with less than 1 lakh per cubic mm.

METHODS

Study type

It was a prospective observational study.

Study place

The study was conducted at the Narayana Medical College and Hospital.

Study period

The duration of the study was from 01 April 2023 to 31 September 2023.

Selection criteria

In this study, a total of 50 antenatal cases with thrombocytopenia were identified from all the antenatal cases attending the outpatient department in a time span of six months.

Inclusion criteria

All antenatal patients attending the out-patient department of Narayana Medical College and Hospital, Nellore with total platelet counts <1,50,000/µl in any trimester were included to be a part of this study.

Exclusion criteria

There were no exclusion criteria.

Basis of analysis

All women had platelet count estimation at the time of enrolment. Platelet count assessment was done through automated blood count analyser with routine antenatal

haematological evaluation of the patient. Detailed menstrual, obstetric history was taken. Presenting complaints if any, findings of general, systemic and obstetric examination including pelvic examination if required of all the patients were recorded in an approved proforma. Investigations including urine for albumin/sugar, complete blood count (CBC), liver function test (LFT), renal function test (RFT), peripheral blood smear, coagulation profile, detection of malaria (by malarial antigen detection or peripheral blood smear), dengue IgG and IgM antibodies were done as and when required. Gestational age was established by menstrual history and clinical examination confirmed by ultrasonography (USG). The diagnosis was inferred from the above investigations. Platelet count of 1,00,000/mm^3 to 1,50,000/mm^3 was classified as mild thrombocytopenia, 50,000/mm^3 to <1,00,00/mm^3 as moderate thrombocytopenia and <50,000/mm^3 as severe thrombocytopenia.

Statistical analysis

All recorded data will be entered using Microsoft excel software and analysis using statistical package for the social sciences (SPSS) software V.25 for determining the statistical significance. Results of continuous measurements will be presented in mean and standard deviation (SD). Results of categorical measurements will be presented in percentage. Qualitative data analysis will be done by chi-square test. Quantitative data analysis will be done by t-test. P value <0.05 will be considered significant.

RESULTS

Table 1 shows that there is no relationship between gravida status and thrombocytopenia.

Table 1: Distribution according to gravida status.

Status	Number	Percentage
Primi gravida	13	26.2
Multi gravida	34	68.1
Grand multi gravida	3	6
Total	50	

Table 2 shows the diagnosis of thrombocytopenia is more in the 3rd trimester.

Table 2: Gestational age at the time of diagnosis.

Gestational	Mild	Modera -te	Severe	Total
1st trimester	2	1	0	3
2nd trimester	9	2	2	13
3rd trimester	26	5	3	34
Total	37	8	5	50

Mild degree of thrombocytopenia is the most common type where the maternal and fetal effects are minimum to almost nil.

According to Table 3, gestational thrombocytopenia is a milder form of the disease with mainly asymptomatic patients, whereas thrombocytopenia associated with hypertension is of the severe producing symptoms which affect the maternal and fetal wellbeing. Out of the non-gestational causes of thrombocytopenia, ITP is the most common cause.

Table 3: Distribution according to type.

Cause	Mild	Modera -te	Severe	Total
Gestational	26	5	0	32
Hypertension associated	6	2	3	11
ITP	3	2	0	5
Viral	2	0	0	2
Idiopathic	1	0	0	1

According to Table 4, maternal complications such as antepartum and postpartum haemorrhage, anemia, shock, increased risk of infections, sepsis, DIC were significantly more in the patients who had associated hypertension 54.42%. Out of all cases of gestational thrombocytopenia only 6.81% of the cases had associated maternal complications.

Table 4: Maternal complications.

Complications	Yes	No	Total
Gestational	2	29	31
Associated with hypertension	6	5	11
Non gestational	2	6	8
Total	10	40	50

DISCUSSION

Thrombocytopenia in pregnancy is a very common disorder of pregnancy, mainly asymptomatic and hence, often goes undiagnosed. In the last decade, the number of reported cases of thrombocytopenia have increased tremendously because of the automated blood count machine. In the present study, a total of fifty cases of thrombocytopenia were collected out of which 74.12% were mild, 16.2% were moderate and the rest 10.1%. were severe. According to study conducted by Singh et al, prevalence of thrombocytopenia was 8.8%. There were 74.7% cases of mild thrombocytopenia, 17.9% of moderate thrombocytopenia and 7.4% with severe thrombocytopenia.

It was noted that out of 50, 68.42% of them were diagnosed in the third trimester. According to Boehlen et al, platelet counts fall in the third trimester leading to

thrombocytopenia, it is in correspondence with our study where there is marked incidence in the third trimester.[5] This causes of thrombocytopenia are gestational, pregnancy induced hypertension, immune thrombocytopenic purpura (ITP), viral thrombocytopenia, pseudothrombocytopenia and idiopathic.

Out of the 50 cases taken, 62% of the cases were gestational thrombocytopenia, but in the study conducted by Parnas et al found that the main causes of TCP were gestational TCP (59.30%) and study by Sangeetha et al shown to be 38%.

Diagnostic criteria of gestational thrombocytopenia

Diagnosis of exclusion with platelet count <1,50,000 and >50000/l in the absence of other causes or disorder associated with thrombocytopenia.[6,7]

In a study by Luthra 32.69% was secondary to hypertensive disorders; and in the study by Huparikar et al. It was about 21.09 percent and is in accordance with my study which was 22% due to pregnancy induced hypertension and the rest were due to non-gestational causes.

Diagnosis of ITP (American Hematological Society)

Primary ITP was defined as a platelet count less than 50000/l in the absence of other causes or disorders that may be associated with thrombocytopenia.[8]

Out of the 50 cases 10 percent of cases were due to ITP, where as in the study by Huparikar et al. ITP was the cause among 5.6 percent of pregnant.

In our study, 54.5% of the cases of PIH suffered from maternal complications. Where as in a study conducted by Dhakad, 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. Moderate and severe thrombocytopenia constitutes 41% of the cases of PIH.[16]

Diagnosis of severe preeclampsia

Hypertension developing after 20-weeks gestation and the coexistence of one or more of the following new onset conditions: proteinuria; other maternal organ dysfunction-renal insufficiency (creatinine >90 μmol/l); liver involvement (elevated transaminases and/or severe right upper quadrant or epigastric pain) neurological complications (examples include eclampsia, altered mental status, blindness, stroke, or more commonly hyper reflexia when accompanied by clonus, severe headaches when accompanied by hyperreflexia, persistent visual scotomata) haematological complications (thrombocyte-penia, DIC, haemolysis); and uteroplacental dysfunction and fetal growth restriction.[9,10]

Diagnosis of HELLP (by Mississipi classification)

Elevated live enzymes AST/ART ≥2 times the upper limit, low platelet <1,00,000 cells/l, peripheral smear with schistocytes and burr cells, S. bilirubin >1.2 mg/dl, LDH>2 times the upper level of normal (200-400 IU/l), and severe anemia unrelated to blood loss.[11,12]

Diagnosis of AFLP

Elevated liver enzymes AST or ALT ≥2 times the upper level, elevated serum bilirubin levels, low serum creatinine, elevated white blood count, elevated ammonia level, elevated uric acid, prolonged PT/INR, aPTT, low platelet count, low fibrinogen, fragmented RBC and burr cells, and proteinuria.[13]

In newborns of mothers with moderate and severe thrombocytopenia a higher incidence of lower 5-minute Apgar score, intrauterine fetal growth restriction (IUGR) and stillbirths was observed.[16]

Limitations

This study was conducted with a very small sample size of 50 participants over a span of six months only. The scope of this study is limited to maternal complications affecting the severity of thrombocytopenia. Fetal outcomes were not recorded in this study. This study was an observational study only and the patients were followed only up to the delivery of the baby. Post pregnancy recovery was not recorded in these patients due to loss to follow-up. Pre pregnancy records of most patients were not available.

CONCLUSION

Timely identification and management of the cause of thrombocytopenia is crucial in the antenatal group of women. Most of the cases of thrombocytopenia are incidental findings with asymptomatic patients. Pregnancy induced hypertension and HELLP syndrome are the second most common cause of thrombocytopenia. When ITP is the cause identified, Intravenous immunoglobulin and corticosteroids are used as the first line management options. Thrombocytopenia has no influence on age, parity, gestational age, mode of delivery. Maternal complications like postpartum haemorrhage, abruptio, DIC require an immediate response to save the patient's life. Fetal complications like intrauterine growth restriction (IUGR) and intrauterine death can be avoided by timely intervention.

Thus every pregnant woman should undergo a detailed blood count examination once in each trimester to identify the pattern of thrombocytopenia and to decide when and at what stage intervention is required.

Funding: No funding sources
Conflict of interest: None declared

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

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Cite this article as: Vineetha A, Bhavani K. A study to evaluate prevalence of thrombocytopenia in antenatal patients. Int J Reprod Contracept Obstet Gynecol 2023;12:3373-7.