

Prevalence and Fetomaternal Outcomes of Pregnancies Complicated with Thrombocytopenia

Maimoona Qadir¹

¹ Assistant Professor, Department of Gynecology, Khyber Teaching Hospital, Peshawar Pakistan
Concept, Design, Data collection, Analysis, Data interpretation, Critical review

CORRESPONDING AUTHOR

Dr. Maimoona Qadir
Assistant Professor, Department of Gynecology,
Khyber Teaching Hospital, Peshawar Pakistan
Email: dr.maimoona1983@gmail.com

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ABSTRACT

Background: Thrombocytopenia, defined as a blood platelet count below 150×10^3 per μL , is an important cause of blood disorders in pregnancy after anemia. It complicates 7 to 10% of pregnancies. **Objective:** To determine the etiological factors of thrombocytopenia in pregnancy and the fetomaternal outcomes. **Study Design:** Cross-sectional, prospective observational research. **Settings:** Gynae Department of Khyber Teaching Hospital, Peshawar Pakistan. **Duration:** January 2021 to December 2023. **Methods:** It included antenatal women of any age or parity with thrombocytopenia in pregnancy. Patient's lab and clinical profiles were also collected. **Results:** The mean age of the antenatal women with thrombocytopenia was 26.3 ± 5.54 years. The clinical signs were pallor 64.7%, bruising 22.6%, edema 6.3%, epistaxis 5.6%, and melena 3.4%. The mean WBC count was $12.2 \pm 3.7 \times 10^9/\text{L}$, the mean platelet count was 47.0 ± 24 /uL, and the mean Hb was 10.4 ± 3.6 g/dL. 42 patients (40%) had mild, 47 (43.5%) had moderate, and 19 patients (17.5%) had severe counts $< 30 \times 10^9/\text{L}$. 77 (71.2%) of the 150 individuals with thrombocytopenia had pregnancy-related reasons. There were 45 (41.6%) cases of GT, 1 (1%) patients with fatty liver, 19 (17.5%) patients with pre-eclampsia, and 12 (11%) patients with eclampsia. **Conclusion:** The study demonstrates that Gestational thrombocytopenia is the most prevalent etiological factor of thrombocytopenia in pregnancy, and no treatment is required. In contrast, pre-eclampsia and eclampsia are life-threatening disorders with dangerous consequences. The other reasons, such as infections and ITP, need customized care.

Keywords: Thrombocytopenia, Neonatal outcome, Eclampsia, Pre-eclampsia, Pregnancy.

INTRODUCTION

Thrombocytopenia complicates between 7% and 10% of pregnancies and is the important cause of hematological disorders in pregnancy, following anemia.¹ It is categorized as mild when the platelets counts are $50\text{--}100 \times 10^9/\text{L}$, moderate when the counts are $30\text{--}50 \times 10^9/\text{L}$, and severe when they are less than $30 \times 10^9/\text{L}$.² The reason for thrombocytopenia during the antenatal period is not known, but it may be due to either increased platelet "turnover" or decreased platelet production, which is most likely the result of hemodilution during pregnancy, and it could also be caused by an increase in platelet destruction, increased platelet activation leading to raised distribution widths, and platelet-derived COX-1 increase.³

The literature indicates that severe pre-eclampsia accounts for 22% of cases of pregnancy-related thrombocytopenia, immune thrombocytopenic purpura (ITP) for 11%, and GT with platelet counts $< 100 \times 10^9/\text{L}$

for 4.4% to 11.7% of antenatal women, contributing 75% of all cases of thrombocytopenia in pregnancy.⁴ Other causes, which include antiphospholipid syndrome, DIC, hemodilution, bone marrow malignancies, and nutrient intake deficiencies, accounted for 8% of cases.⁵

Because thrombocytopenia can occur alone or in combination with other diseases, it is essential to exclude systemic medical disorders. Previous studies conducted in Pakistan have demonstrated that Gestational thrombocytopenia accounted for 6% to 75% of cases of pregnancy-related thrombocytopenia and is the most prevalent etiological factor of thrombocytopenia in pregnancy.⁶ In the third trimester, the platelets decrease by around 10%; they then recover to normal six weeks following delivery.⁷

According to reports, 0.01–0.05 percent of pregnancies have ITP. Furthermore, it can arise in any trimester of pregnancy and can be difficult to diagnose and treat, particularly during pregnancy. Thrombocytopenia

without a recognized cause or illness is referred to as primary ITP.⁸ The underlying condition that causes thrombocytopenia and immunological dysfunction is assumed to be present in secondary ITP. The majority of ITP-affected women have mild to severe thrombocytopenia, and between 30% and 35% of cases require prenatal care.⁹ Thrombocytopenia increases the chance of recurrence in pregnant women; however, consequences from the condition can be minimized by early identification.¹⁰

We planned this research to determine the cause of thrombocytopenia in pregnancy and the impact it has on the fetomaternal outcome.

METHODS

The Department of Gynecology and Obstetrics, Khyber Teaching Hospital, Peshawar conducted this descriptive cross-sectional study from January 2021 to December 2023.

Based on the assumed prevalence of 8%, at the 95% confidence level, and an absolute precision of 10%, a sample size of 77 patients was determined.¹¹ After obtaining informed consent, all antenatal women who fulfilled the inclusion criteria and were admitted through the emergency department were included. Pregnant women with thrombocytopenia and platelets $<100 \times 10^9/L$ were included. Women who were antenatal and had a history of diabetes, liver illness, kidney problems, heart disease, cancer, or other medical conditions were excluded.

Pregnant ladies who fulfilled the inclusion criteria were enrolled. A thorough history including details of gestational age, age, gravida, parity, LMP, and any complications like hypertension or antepartum hemorrhage, the outcome of prior pregnancies, the history of antepartum and postpartum hemorrhage in past pregnancies, and the present pregnancy. Blood samples were taken, and the complete blood count, LFTs, PT, and APTT, as well as a peripheral smear examination, were all performed and recorded in predesigned proforma. The institute's ethical review committee gave the study approval.

Software for statistical data entry and analysis, SPSS version 22. For qualitative factors, percentages and frequencies were noted. For quantitative characteristics including age, gestation age, and platelet counts, the mean $\pm$ standard deviation was recorded.

RESULTS

The mean age of antenatal women with thrombocytopenia was 26.3 ± 5.54 years. At baseline, the clinical signs were pallor 64.7%, bruising 22.6%, edema

6.3%, epistaxis 5.6%, and Malena 3.4%. The WBC count was $12.2 \pm 3.7 \times 10^9/L$, the mean platelet count was 47.0 ± 24 at baseline, and the mean Hb was 10.4 ± 3.6 g/dL. At the time of diagnosis, 42 patients (40%) had mild thrombocytopenia, 47 patients (43.5%) had moderate counts, and 19 patients (17.5%) had severe counts $< 30 \times 10^9/L$.

77 antenatal women with documented thrombocytopenia had pregnancy-related reasons. In this, there were 45 (41.6%) cases of GT, 1 (1%) patients with fatty liver, 19 (17.5%) patients with pre-eclampsia, and 12 (11%) patients with eclampsia. To address thrombocytopenia in the patients, supportive care was administered in 72 cases of GT. Of these patients, 26 (36.1%) had IV tranexamic acid for light bleeding, while the remaining patients received supplements and close monitoring. Out of the eighteen women who had hypertensive disorders of pregnancy, three (16.6%) were transfused platelets because of antepartum hemorrhage; five (27.7%) had counts less than $50 \times 10^9/L$ before or during cesarean section; and ten (55.5%) had transfusions after delivery because of postpartum hemorrhage. There were 31 (28.7%) patients with nonpregnancy-related causes, 19 (17.5%) patients with idiopathic thrombocytopenic purpura (ITP); 6 (5.5%) patients with hepatitis C; 3 (2.7%) patients with dengue; and three (2.7%) patients with malaria.

16(84%) of the 19 ITP patients got treatment; 8 (50%), 3(18.7%), and 5(31.2%) received oral prednisolone, two (12.5%) received IV methylprednisolone, and dexamethasone respectively.

Table 1: Maternal platelet counts at diagnosis (n=77)

Primary thrombocytopenia specific to pregnancy (n=77)				
Causes of Thrombocytopenia	Mild 50-100x10 ⁹ /L	Moderate 50-30x10 ⁹ /L	Severe <30x10 ⁹ /L	Total
	(n=32)	(n=33)	(n=12)	(n=77)
Gestational Thrombocytopenia	20	25	0	45
Fatty liver	1	0	0	1
Pre-eclampsia	7	6	6	19
Eclampsia	4	2	6	12
Secondary thrombocytopenia / Non-pregnancy related causes (n=31)				
ITP	5	8	6	19
Hepatitis C	3	2	1	6
Malaria	1	2	0	3
Dengue	1	2	0	3

Table 2: Treatment and response in ITP patients (n=16)

Treatment	Good Response	Partial Response	No Response
Prednisolone	5 (31%)	2 (12.5%)	1 (6%)
Methylprednisolone (IV)	2 (12.5%)	1 (6%)	0
Dexamethasone	5 (31%)	0	0
Total	12	3	1

Table 3: Fetomaternal outcomes in patients of thrombocytopenia (n=77)

Variables		Frequency (Percentage)
Maternal Complications	Antepartum Hemorrhage	21 (19.4%)
	Postpartum Hemorrhage	29 (27%)
	Mortality	0
Mode of Delivery	Normal vaginal Delivery	55 (51%)
	Cesarean Section	14 (13%)
	Miscarriage	8 (7.4%)
Neonatal Outcomes	Neonatal thrombocytopenia	3 (2.7%)
	Preterm delivery	4 (3.7%)
	IUFD	0

DISCUSSION

The most frequent etiological factor responsible for thrombocytopenia in our research (45%) was GT. ITP (19%) and pre-eclampsia/eclampsia (31%), were the next most prevalent causes. Out of the 77 antenatal patients in our sample, a platelet counts of more than 30×10^9 was observed in 45 women. Nearly all of these individuals had thrombocytopenia initially identified at 14 weeks of gestation onwards; our results are supported by the study done by Ahmad OI in Sudan at Ibrahim Malik Teaching hospital.¹²

The majority of cases of ITP in obstetric patients are detected in the first trimester of pregnancy, and most have a history of prior thrombocytopenia.¹³ ITP is an autoimmune condition that impairs both platelet production and survival.¹⁴ Similarly, every one of our 19 patients had a history of thrombocytopenia; 14 of them had counts $<50 \times 10^9/L$ at baseline and were pregnant when they first appeared. This correlates with the study of Padmawar J *et al* and Singh K *et al* India in 2020.^{15,16}

Similar to this, our study showed that 19 individuals had platelets count $<30 \times 10^9/L$, of which 6 had a history of hemorrhage during pregnancy and 4 had hemorrhage after delivery. Neonatal thrombocytopenia was seen in

three (2%) of the babies, although there was no sign of bleeding. This is in line with a Study done by Rottenstreich A *et al* in a teaching hospital of Sweden showing that thrombocytopenia in infants is rare (between 10% and 15%) and does not cause bleeding problems.¹⁷

Preeclampsia and eclampsia are hypertension illnesses linked to thrombocytopenia caused by pregnancy; these conditions accounted for the third most prevalent cause in our study. Pre-eclampsia along Eclampsia and HELLP were the most common causes of Thrombocytopenia in pregnancy according to study conducted by Anita J *et al*.¹⁸

Fortunately, our study did not reveal any maternal or fetal deaths. Nonetheless, some workers have experienced mortalities related to this disease. Ciobanu AM *et al* in their research study in Egypt revealed that 6% was the maternal mortality rate of their study population, which is quite high, whereas the perinatal mortality rate in their study was 11%.¹⁹

In our analysis, only one hepatitis C patient experienced severe thrombocytopenia and antepartum hemorrhage; she received a platelet transfusion. Pafumi C *et al* in their research reported that thrombocytopenia was found in 7% of their study population who were positive for hepatitis C antibodies.²⁰

CONCLUSION

In summary, our research indicates that hypertensive disorders of pregnancy are grave conditions with a high risk of negative outcomes. The most frequent cause of thrombocytopenia in our research, GT, does not require any kind of active therapy. Therefore, to avoid complications, the causes must be found and managed promptly. Pregnancy-related thrombocytopenia is linked to an increased risk of morbidity in both mothers and newborns. Therefore, cautious monitoring of these mothers and babies is needed to determine the cause and provide prompt, suitable treatment.

LIMITATIONS

There were a few limitations in our study. Firstly, It was a single-centre study, the inclusion of other health facilities from the same locality could have given a better idea about the prevalence of this condition. Secondly, the patients and babies were only followed during their stay in the hospital and not followed after discharge from the hospital.

SUGGESTIONS / RECOMMENDATIONS

Thrombocytopenia in pregnancy should be identified early through routine platelet screening, especially in the third trimester. Women with platelet counts below $100 \times 10^9/L$ require close monitoring and specialist

evaluation. A multidisciplinary approach involving obstetricians, hematologists, and neonatologists is essential for optimal outcomes. Institutional protocols should guide diagnosis and management, and neonatal platelet counts should be checked after birth. Further large-scale studies are recommended to develop standardized guidelines and improve fetomaternal outcomes.

CONFLICT OF INTEREST / DISCLOSURE

There was no conflict of interest.

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