

Evaluation of Maternal Thrombocytopenia in Pregnancy and its Outcomes – A Prospective Study

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Abstract

Background: Thrombocytopenia is a common hematological finding during the last trimester of pregnancy. Appropriate differential diagnosis should be undertaken for adequate management. Regular monitoring of the condition is necessary to avoid adverse fetal & maternal complications.

Aims & Objectives: To determine various causative factors of thrombocytopenia during pregnancy and maternal & fetal outcomes.

Material & Method: This prospective observational study recruited 100 antenatal women with thrombocytopenia who visited the outdoor of Department of Obstetrics and Gynecology of G S Medical College and Hospital, Pilkhuwa, Uttar Pradesh from Aug 2021 to Feb 2022. A written informed consent was obtained from all the participants and institutional ethics approval obtained. A complete medical history was undertaken. Venous blood samples were taken, platelet count noted & patients were followed up till delivery. Any complications arising were noted and treated accordingly, blood products transfused wherever necessary. Maternal and foetal outcome were recorded.

Conclusion: Maternal thrombocytopenia arising out of medical conditions needs strict monitoring & medical management. This may avoid unnecessary fetal & maternal complications & promote maternal & neonatal wellbeing.

Keywords: Thrombocytopenia, Pregnancy, Anaemia, Preeclampsia

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Introduction

The second most common hematological abnormality during pregnancy is Thrombocytopenia. [1] It is defined as platelet count of less than 1,50,000/ μ L. It can occur either due to increased destruction of platelet or minimal production. [2] It is considered as mild if platelet count is 1-1.5 lakh/ μ L, moderate at 50000 – 100000/ μ L and severe at < 50000/ μ L. The prevalence of thrombocytopenia in last trimester is 6.6 to

11.6%. [3] During pregnancy, an increased platelet destruction can occur due to immunologic destruction, abnormal platelet activation, or increased peripheral platelet consumption & platelet aggregation driven by increased thromboxane A levels. [4] Although the average platelet count decreases monotonically in pregnancy, there is an increase in platelet aggregation especially during last 8 weeks of gestation. [5] It has

been reported that there can occur significant fall in platelet count from 32 weeks gestation onwards. [6]

The reduction in circulating platelets can be explained by increased platelet consumption & decreased life span in the uteroplacental circulation. Platelet count as well as other hemostatic factors return to normal after 6 weeks of delivery. [7]

Gestational thrombocytopenia is noted in 8% of all pregnancies & is the commonest etiology for thrombocytopenia of pregnancy . [3] Usually there is no past history with spontaneous resolution within 1-2months after delivery. Thrombocytopenia in newborn does not occur but recurrence can occur in subsequent pregnancy. [8] The differential diagnosis is Idiopathic thrombocytopenic purpura (ITP).There are no specific tests to differentiate between ITP & Gestational thrombocytopenia. Patient response to steroids and immunoglobulin favors the diagnosis of ITP. In ITP a moderate to severe decrease in the platelet count is observed owing to platelet auto-antibodies. [9] Cases require medical management due to risk of maternal hemorrhage & neonatal thrombocytopenia.

A decreased production is uncommon in pregnancy and observed in association with bone marrow disorders or nutritional deficiencies. Other etiologies should be excluded before diagnosing the case as megaloblastic anemia, immune thrombocytopenia, thrombotic microangiopathy syndromes, eclampsia and liver disorders before labeling the patient as gestational thrombocytopenia. [10]

Various etiologies could be viral Infection (such as human immunodeficiency virus, hepatitis C, cytomegalovirus, Pylori, Nutritional deficiencies thrombocytopenia, Congenital thrombocytopenia. Other rare etiologies could be secondary immune thrombocytopenia, antiphospholipid syndrome, secondary lupus erythematosus,

Drug-induced thrombocytopenia (such as heparins, antimicrobials, anticonvulsants, analgesic agents)s, association with systemic conditions disseminated intravascular coagulation, Thrombotic thrombocytopeni a/ haemolytic uremicsyndrome Splenic sequestration, Bone marrow disorders. [9]

Laboratory investigations to be undertaken are Complete Blood cell Count (CBC), reticulocyte count, blood smear, liver function test, viral screening (HIV, HCV, and HBV). Other investigations include anti phospholipid antibodies, antinuclear antibodies, thyroid function test, H. pylori testing, DIC testing, VWF type testing, Direct coombs test. [11] Thus this prospective observational study was conducted to determine various causative factors of thrombocytopenia during pregnancy and maternal & fetal outcomes.

Material & Methods

This prospective observational study recruited 100 antenatal women with thrombocytopenia who visited the outdoor of Department of Obstetrics and Gynaecology of G S Medical College and Hospital, Pilkhua, Uttar Pradesh from Aug 2021 to Feb 2022. Women with gestation more than 28 weeks and platelet count less than 150,000/ μ L were included in the study. Antenatal women with multiple gestations, Malignancy with thrombocytopenia, Thrombocytopenia due to cancer chemotherapy were excluded from the study. A written informed consent was obtained from all the participants and institutional ethics approval obtained.

A complete medical history was undertaken. History of previous conceptions, Maternal high risk factors, liver disorders, family history of bleeding, dengue, anaemia, malaria, bleeding problems, history of transfusion and drug history.

Complete hematological profile was undertaken with viral markers for dengue,

chikungunya, FDPs, fibrinogen levels. Platelet count was done using an autoanalyzer & confirmed on peripheral blood film. Viral markers for dengue, Repetition of counts was done after transfusions and at the time of delivery. The patients were followed till delivery. Any complications arising were noted and treated accordingly, blood products transfused wherever necessary. Maternal and foetal outcome were recorded.

Statistical Analysis

The collected data was tabulated & put to statistical analysis. The data was presented as frequency and percentage. The data was expressed as mean & standard deviation.

Pearson's Chi Square test was used for analysis. P-value <0.05 was considered statistically significant.

Results

In the present study, mean age of patients was 26.32 ± 2.78 years in the age range 20- 29 yrs. The mean gestation period was 36.32 ± 3.04 weeks. 48% of patients were primigravida. 95% patients had no specific symptoms related to thrombocytopenia. No significant past history noted in 61% patients while 10% had a history of blood/platelet transfusion.

25% patients had mild, 60% had moderate & 15% had severe thrombocytopenia. (Fig 1)

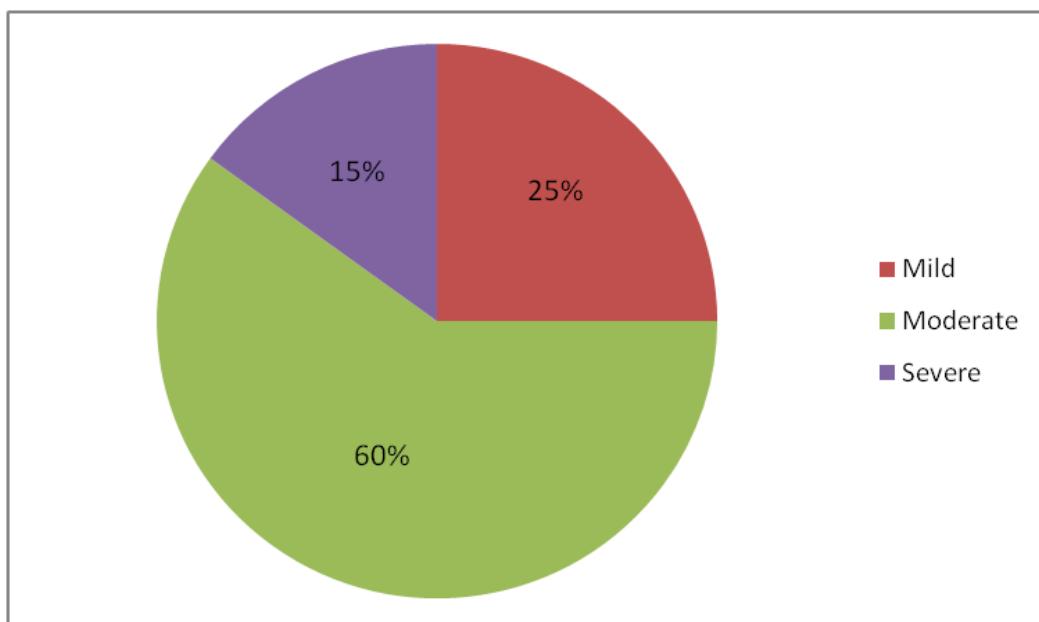
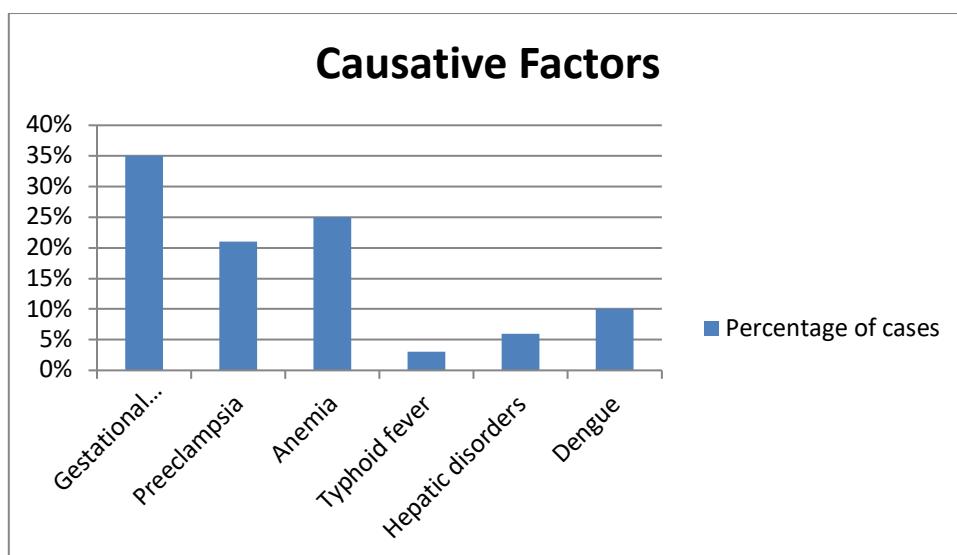


Figure 1: Severity of Thrombocytopenia

Various causative factors responsible for thrombocytopenia were gestational thrombocytopenia (35%), nutritional anemia (25%), preeclampsia/eclampsia (21%), Dengue fever (10%), Hepatic disorders (6%), Typhoid fever (3%)

(Figure 2). Highest platelet count was noted in gestational thrombocytopenia ($1,40,000/\mu\text{L}$) & lowest in nutritional anaemias ($15000/\mu\text{L}$) (Fig 2). 33% patients had a C section delivery while rest 67% were vaginal deliveries.

**Figure 2: Causative Factors of Thrombocytopenia**

In 11% patients .maternal complications were observed as HELLP, ICU admission, postpartum hemorrhage (PPH) and P. sepsis. The patients having severe thrombocytopenia experienced more maternal complications (35.76%).

Foetal complications were seen in the form of low Apgar score (15%), NICU admissions (13%) and Intra Uterine death (IUD) 5% (Table 1).

Table 1: Fetal Outcomes

Fetal complications	No of patients	Mild thrombocytopenia	Moderate thrombocytopenia	Severe thrombocytopenia	Sig
Low Apgar Score <1 min	15	4	6	5	p>0.05
NICU admission	13	3	6	4	p>0.05
Intrauterine Deaths	5	1	1	3	p>0.05

Discussion

The present prospective observational study was undertaken on 100 antenatal women with thrombocytopenia.

In the present study, gestational thrombocytopenia was the commonest cause (35%). This was followed by Nutritional anaemia (25%) & preeclampsia / eclampsia(21%). This was in accordance to the studies done by Sahiwal et al 2021 [11] , Vishwekar PS et al 2017. [12]

Other causes were Dengue fever (10%) which is endemic in our area. Hepatic disorders (6%), Typhoid fever (3%) account for the rest. Sahiwal et al study,

reported Dengue fever (12%), Hepatic disorders (5%), Typhoid fever (2%) and drug induced in 1% as various other etiologies for thrombocytopenia. [11]

In the present study, 25% patients had mild, 60% had moderate & 15% had severe thrombocytopenia. Perepu U and Rosenstein L in 2013 stated that in spite of thrombocytopenia being common during pregnancy, it was occasionally severe. This was in accordance with the present study results. [13] Mishra et al observed consistent findings with majority of females having mild thrombocytopenia (70.71%). [14]

The prevalence of thrombocytopenia was reported 6% in population based study by Burrows and Kelton 1993 [3], 7.3% by Sainio et al. [15] & 8.78% by Vishwekar et al. 2017 [12]. The prevalence is somewhat similar to global population (5–12%). [15]

Highest platelet count was noted in gestational thrombocytopenia (1,40,000/ μ L) & lowest in nutritional anaemias (15000/ μ L). Sahiwal et al reported increased complications in subjects in severe cases of thrombocytopenia (44.44%). [11] The findings were consistent to study by Vishwekar PS et al [12], but in contrast to study conducted by Anita H et al. [16] which stated thrombocytopenia to not directly related to maternal outcome.

In the present study, 33% patients had a caesarian sections delivery while rest 67% were vaginal deliveries.

Thrombocytopenia does not seem to affect mode of delivery, normal vaginal delivery were more common. In a study by Sahiwal et al 37% caesarian sections & 63% vaginal delivery were reported . Caesarian sections were conducted for obstetric purposes rather than for thrombocytopenia eg foetal distress, failed induction etc. [11] Our findings are similar to those of Nisha S et al., [17] and Vishwekar PS et al [12]. These results are in agreement with studies by Vishwekar et al., [12] Chauhan et al. [18] The caesarean sections done were only for obstetrical indication. In contrast Gernsheimer et al 2013 observed a statistically significantly higher rate of C section delivery in thrombocytopenic women. This may be as neonates may experience intracranial hemorrhage during vaginal deliveries. [19]

In the present study, maternal complications were noted as 11% as HELLP, ICU admission, PPH and puerperal sepsis. The patients having severe thrombocytopenia experienced more maternal complications (35.76%). [20] Similarly, Misra et al 2020 in a cross

sectional study noted maternal complications like postpartum hemorrhage (27.14%), puerperal sepsis (9.28%), placental abruption (5%), need for transfusion (20%). [14]

In the present study, neonatal complications were seen in the form of low Apgar score, NICU admissions and Intra Uterine death (IUD). 15% neonates had low Apgar Score <1 min, 13% had NICU admissions & 5% intrauterine deaths were noted. Consistent with the findings of present study Gernsheimer et al 19 reported neonatal complications like jaundice, birth asphyxia and neonatal thrombocytopenia and low Apgar score .Mishra et al 2020 observed neonatal jaundice (20%), NICU admission (12.14%), neonatal thrombocytopenia (12.14%), low Apgar (37.14%), birth asphyxia (12.86%), need for resuscitation (30%) as perinatal complications . [14]

Conclusion

Thrombocytopenia has a high prevalence in pregnant females with gestational week of more than 36 weeks. It is the second most common hematological complication after anemia which often goes undiagnosed. An accurate differential diagnosis should be made to identify the various etiologies associated with Thrombocytopenia. This could prevent & adequately treat the complications associated leading to favourable maternal & neonatal outcomes.

References

1. Sullivan CA, Martin JN Jr. Management of the obstetric patient with thrombocytopenia. Clin Obstet Gynecol 1995; 38(3):521-34.
2. Kam PC, Thompson SA, Liew AC. Thrombocytopenia in the parturient. Anaesthesia 2004; 59(3):255-64.
3. Burrows RF, Kelton JG. Fetal thrombocytopenia and its relation to maternal thrombocytopenia. N Engl J Med 1993; 329(20):1463-6.

4. Fay RA, Hughes AO, Farron NT. Platelets in pregnancy: hyperdestruction in pregnancy. *Obstet Gynecol* 1983; 61(2):238-40.
5. Fay RA, Hughes AO, Farron NT. Platelets in pregnancy: hyperdestruction in pregnancy. *Obstet Gynecol*. 1983; 61:238-40.
6. Ahmed Y, van Iddekinge B, Paul C, Sullivan MHF, Elder MG. Retrospective analysis of platelet numbers and volumes in normal pregnancy and pre-eclampsia. *Br J Obstet Gynecol*. 1993; 100:216-20.
7. Shehata N, Burrows RF, Kelton JG. Gestational thrombocytopenia. *Clin Obstet Gynecol*. 1999;42:327-34
8. ACOG practice bulletin: Thrombocytopenia in pregnancy. Number 6, September 1999. Clinical management guidelines for Obstetricians and Gynecologists. American College of Obstetricians and Gynecologists. *Int J Gynaecol Obstet* 1999; 67(2):117-128.
9. Cunningham FG, Gant NF, Leveno KJ, Gilstrap III LC, Hauth JC, Wenstrom KD. Williams obstetrics, 21st edn. McGraw-Hill, Hematological disorders; 2001, p.1307–38 [Chapter 49]
10. Khellaf M, Loustau V, Bierling P, Michel M, Godeau B. Thrombocytopenia and pregnancy. *Rev Med Intern*. 2012 Aug;33(8):446-52.
11. Sahiwal H, Kaur P, Garg R, Kaur M. Thrombocytopenia during pregnancy and its outcome- A prospective study. *Indian J Obstet Gynecol Res* 2021;8(2):212-216.
12. Vishwekar PS, Yadav RK, Gohel CB. Thrombocytopenia during Pregnancy and Its Outcome – A Prospective Study JKIMSU 2017; 6(1), 82-89
13. Perepu U, Rosenstein L. Maternal thrombocytopenia in pregnancy. *Proc Obstet Gynecol* 2013; 3(1): 6.
14. Misra D, Faruqi M. Fetomaternal outcome in pregnancy with gestational thrombocytopenia: a cross sectional study. *Int J Reprod Contracept Obstet Gynecol* 2020; 9:2751-8.
15. Sainio S, Kekomäki R, Riikonen S, Teramo K. Maternal thrombocytopenia at term: a populationbased study. *Acta Obstet Gynecol Scand* 2000;79(9):744-9.
16. Anita H, Reddy A, Vanaja S, Anupama H. Thrombocytopenia in Pregnancy. *Indian J Obstet Gynecol Res*. 2016;3 (1):7.
17. Nisha S, Amita D, Uma S, Tripathi AK, Pushplata S. Prevalence and Characterization of Thrombocytopenia in Pregnancy in Indian Women. *Indian J Hematol Blood Transfus*. 2012;28(2):77–81.
18. Chauhan V, Gupta A, Mahajan N, Vij A, Kumar R, Chadda A. Maternal and fetal outcome among pregnant women presenting with thrombocytopenia. *Int J Reprod Contracept Obstet Gynecol*. 2016; 5:2736-43.
19. Gernsheimer T, James AH, Stasi R. How I treat thrombocytopenia in pregnancy. *Blood* 2013; 121:38-47.
20. Atbib Y., Essad A., Zhar H., Tadlaoui, Yasmina, Ait El Cadi, M., & Bousliman Y. Impact de l'immunothérapie dans la prise en charge du cancer du poumon. Etude rétrospective menée à l'Hôpital Militaire d'Instruction Mohammed V-Rabat. *Journal of Medical Research and Health Sciences*, 2022;5(9): 2221–2243.