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Prevalence of gestational thrombocytopenia and its effect on maternal and fetal outcome

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Abstract:

BACKGROUND: Gestational thrombocytopenia (GT) is considered as the most common cause of thrombocytopenia in pregnancy and accounts for about 75% of cases.

OBJECTIVES: The objectives of the study are (1) to estimate the prevalence of GT among antenatal patients at Vardhman Mahavir Medical College (VMMC) and Safdarjung Hospital in New Delhi, India, and (2) to study the fetomaternal outcome in mild, moderate, and severe GT.

MATERIALS AND METHODS: This is a prospective observational study done in the Department of Obstetrics and Gynaecology, VMMC and Safdarjung hospital in New Delhi, India, for a period of 6 months. All antenatal women underwent complete hemogram with manual platelet count in the third trimester. Those with platelet count 150×10^{9} /L were included and divided into three groups on the basis of platelet count. Maternal and fetal outcome was observed. Cord blood was sent for neonatal platelet count. Follow-up was done in these cases till 6 weeks postpartum.

RESULTS: The prevalence of GT was 12.82%. Fetomaternal outcome was favorable. A total of five (2.5%) patients suffered from abruption. Postpartum hemorrhage was present in about 7 cases (3.5%). Blood transfusion including platelet transfusion was needed in around 13 cases (6.5%). There was no maternal mortality. Only 6 (3%) neonates were having thrombocytopenia (platelet count < 150×10^{9} /L) regardless of degree of maternal thrombocytopenia. Twenty-six (13%) neonates were admitted in nursery for monitoring; among these, 11 (5.5%) neonates' ventilation was needed. There was no neonatal death.

CONCLUSION: Better fetomaternal outcome is seen in GT, so a vigilant and careful monitoring can prevent any adverse event.

Keywords:

Gestational thrombocytopenia, mild, moderate, platelets, severe

Introduction

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Submission: 31-07-2018 Accepted: 02-10-2018 The nonnucleated cellular fragments of megakaryocytes are coined as platelets and they play a critical role in hemostasis.^[1] In pregnant women, thrombocytopenia is defined when platelet count is less than 150×10^{9} /L and it occurs in approximately 6.6%–11.6% of pregnant women.^[2-4]

Gestational thrombocytopenia (GT) is considered as the most common cause

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of thrombocytopenia in pregnancy and accounts for about 75% of cases.^[2,5-7] In this condition, the platelet count usually does not fall below 70×10^{9} /L, especially during the third trimester, and the count returns to normal within 2–12 weeks of delivery.^[3,8] The etiology of GT is unknown, but it is presumed that it may be due to the physiological changes of pregnancy leading to relative hemodilution, amplified by the capture or destruction of platelets in the placenta.^[9,10]

Other causes of thrombocytopenia in pregnancy include hypertensive disorders

How to cite this article: Zutshi V, Gupta N, Arora R, Dhanker S. Prevalence of gestational thrombocytopenia and its effect on maternal and fetal outcome. Iraqi J Hematol 2019;8:21-4. (such as eclampsia), 15%–20%; immune causes (such as systemic lupus erythematosus, antiphospholipid syndrome, and primary immune thrombocytopenia), 3%–4%; and other rare causes (such as constitutional thrombocytopenia, infections, and malignancies), 1%–2%.^[1]

As per the literature, it is observed that the GT is not extensively studied, however, when present is a cause of alarming distress to the attending obstetricians.^[1]

Objectives of the study

- 1. To estimate the prevalence of GT among antenatal patients at Vardhman Mahavir Medical College (VMMC) and Safdarjung Hospital in New Delhi, India
- 2. To study the fetomaternal outcome in mild, moderate, and severe GT.

Materials and Methods

This is a prospective observational study done in the Department of Obstetrics and Gynaecology, VMMC and Safdarjung Hospital in New Delhi, India, for a period of 6 months. All antenatal patients underwent a routine complete hemogram with manual platelet count in the third trimester. Those with platelet count $<150 \times 10^9$ /L were included and categorized into three groups on the basis of the level platelet count. After taking a written informed consent, a total of 200 women in the third trimester of pregnancy with platelet count $<150 \times 10^9$ /L having normal blood pressure and without any medical disorder were selected. The outcomes of mild $(100 \times 10^9/L-150 \times 10^9/L)$, moderate (50 \times 10⁹/L-100 \times 10⁹/L), and severe thrombocytopenia ($<50 \times 10^9$ /L) were studied. Coagulation profile (PT/aPTT) along with other routine investigations was done.

In asymptomatic cases, only the availability of blood products was assured for an emergency. In cases of coagulopathy, appropriate interventions were done such as platelet transfusion or other blood product transfusion. Cord blood of all infants was collected to perform platelet count.

Maternal outcome was observed in terms of antepartum hemorrhage (abruption), mode of delivery, third stage complications such as postpartum hemorrhage (PPH), hematoma formation, and need of blood product transfusion. Infants will also be evaluated clinically for hemostatic events (bruises, ecchymosis, etc.), Apgar score, ventilation after initial resuscitation, and stay in nursery ICU if required. Follow-up was done in these cases till 6 weeks postpartum, and repeat platelet count was done at follow-up visit. Appropriate statistical analysis was done.

Results

Total antenatal women screened were 1560 during this 6-month period. Out of which, 200 women were included after assessing the exclusion criteria that were having thrombocytopenia making the prevalence 12.82%. Women mostly were young in the age group of 21–25 years (99, 49.5%) followed by 63 women (31.5%) in the age group of 26–30 years. The mean age in our study is 24.5 years. Majority of the women in this study were from Hindu community (142, 71%) followed by Muslim community (54, 27%).

Most of the women were from low socioeconomic strata (156, 78%). In this study, 113 (56.5%) are primigravida patients, followed by 66 (33%) second gravida and 21 (10.5%) multigravida patients. Around 181 (90.5%) patients delivered at term (period of gestation >37 weeks of pregnancy), and the remaining 19 patients (9.5%) delivered prematurely (the period of gestation <37 weeks of pregnancy).

On the basis of the platelet count of these women, we have found that 62% (124) are having milder forms of thrombocytopenia, 31% (62) are in moderate thrombocytopenia group, and 7% (14) are with severe thrombocytopenia [Table 1].

It has been found that around 188 (94%) patients delivered vaginally; among these, 9 patients had instrumental delivery (forceps/vacuum). Irrespective of the platelet count, lower segment cesarean section (LSCS) has been done for the obstetrical indication. In severe cases, platelet products have been arranged beforehand. All patients with severe thrombocytopenia had been delivered vaginally except one who underwent LSCS under general anesthesia in view of abruption. A patient has been transfused one unit of packed red cells, eight units of pooled platelets products, and four units of fresh-frozen plasma.

All the patients observed for any complications in antenatal period, intraoperative/intranatal period, and postoperative/postnatal period. A total of five patients suffered from abruption, out of which four had been delivered vaginally and one LSCS was done. Intraoperatively, generalized oozing was present in around six cases and one hematoma developed at incision site. PPH was present in about seven cases. Among these PPH cases, one case had mild thrombocytopenia,

Table 1: Degree of thrombocytopenia

Platelet count (×10 ⁹ /L)	n (%)
100-150 (mild)	124 (62)
50-100 (moderate)	62 (31)
<50 (severe)	14 (7)

Zutshi, et al.: Prevalence and outcome of gestational thrombocytopenia

one case had moderate thrombocytopenia, and five cases had severe thrombocytopenia. There are two cases in which hematoma was present at episiotomy site, and one case developed spontaneous hematoma away from episiotomy site. Blood product transfusion including platelet transfusion was needed in around 13 cases [Table 2].

There was no maternal mortality. Immediately, after delivery of the neonate, cord blood was taken and sent for neonatal platelet count. Only 6 (3%) neonates had thrombocytopenia (platelet count <150 × 10⁹/L) regardless of degree of maternal thrombocytopenia. Neonatal outcome was favorable. Twenty-six (13%) neonates were admitted in nursery for monitoring. Among these, 11 (5.5%) neonates were in need for ventilation. There was no neonatal death and no episode of neonatal bleeding or any other hemostatic event [Table 3].

All the patients discharged in a stable condition along with their neonates. Follow-up was arranged after 6 weeks. On follow-up, platelet count was repeated which is found to be normal in all the cases. Those women who were not having normal platelet count at follow-up visit were already excluded and were not included in the sample size.

Discussion

Due to the increased number of antenatal booking and institutional deliveries, there is an increased recognition or diagnosis of thrombocytopenia which has also resulted in controversies regarding management as these conditions are less studied. GT – among the diagnosis of thrombocytopenia – is a diagnosis of exclusion.^[1]

The following characteristics make GT the most likely diagnosis.

- 1. The platelet count usually did not fall below $70 \times 10^9/L$ (usually mild-to-moderate degree of thrombocytopenia)^[2]
- 2. Patients had normal platelet count in interconceptional, preconceptional, and early gestation period with no history of bleeding. The early gestation or preconception platelet count becomes extremely important when differentiating this disorder from primary immune thrombocytopenia, with which it is commonly confused^[11]
- 3. The platelet count returns to normal within 2–12 weeks postpartum^[3-5]
- 4. Usually, the newborn baby will have normal platelet count in cases of GT.

If the newborn baby developed thrombocytopenia or any bleeding manifestations, it can be of two types depending

Table 2: Distribution of patients according to complication

complication		
Complications	n	Total number
Antepartum		
Abruption		
Mild	2	5
Moderate	1	
Severe	2	
Intraoperative		
Generalized oozing		
Mild	3	6
Moderate	2	
Severe	1	
Hematoma at incision site		
Mild	0	1
Moderate	0	
Severe	1	
Postpartum/postoperative		
PPH		
Mild	1	7
Moderate	1	
Severe	5	
Hematoma at episiotomy site		
Mild	1	2
Moderate	1	
Severe	0	
Spontaneous hematoma away from episiotomy site		
Mild	0	1
Moderate	0	
Severe	1	
Need of blood transfusion		
Mild	4	13
Moderate	1	
Severe	8	

PPH=Postpartum hemorrhage

Table 3: Neonatal outcome

Condition of newborn	n (%)
NICU admission	26 (13)
Ventilation/resuscitation	11 (5.5)
Neonatal hemostatic events/bleeding	0
Neonatal death	0

NICU=Neonatal intensive care unit

upon the time at which it appears. Early neonatal thrombocytopenia (first 72 h of life) is less dangerous and usually secondary to placental insufficiency and caused by reduced platelet production; fortunately, most episodes are mild or moderate and resolve spontaneously. Mostly, GT cases are of this type with good prognosis of newborn. Late thrombocytopenia (after 72 h of age) is usually more aggressive and secondary to sepsis or necrotizing enterocolitis and is usually more severe and prolonged.^[12,13]

In this study, we have found a substantial number of cases (7%) with severe thrombocytopenia in which

Zutshi, et al.: Prevalence and outcome of gestational thrombocytopenia

platelet count fall below 50×10^{9} . Any bleeding complication or hematomas are not significantly associated with the degree of fall in the level platelet counts. Around 3% of neonates had thrombocytopenia but not having any complication of it. All the neonates had mild thrombocytopenia.

A prospective cohort study done by Burrows and Kelton of 756 women with a diagnosis of GT showed that none of the mothers and only one infant, which had congenital bone marrow dysfunction diagnosed later, had any bleeding complication.^[5]

In another study by Nagey *et al.* of 730 pregnancies with platelet counts of $<150 \times 10^{9}$ /L, no neonate had a platelet count of $<100 \times 10^{9}$ /L, and no bleeding complications were observed. Thus, it seems that mildly to moderately depressed platelet counts in case of GT are not associated with any adverse effects to the fetus, neonate, or mother, and no management is necessary other than periodic monitoring.^[14]

The prevalence of GT in this study was 12.8%. This figure was consistent with the figures of 11.6% reported by Boehlen in 2006^[15] but higher than the figure 7.2% reported by Sainio *et al.* in 2000.^[16] Olayemi and Akuffo who conducted a study in 2012 reported a much higher prevalence of GT (15.3%).^[2]

Vyas et al. in 2014 conducted a cross-sectional, case-control study in a tertiary care hospital. They recruited a total of 378 women in their study, out of which 266 women were taken as control group who had platelet count between $100 \times 10^9/L$ and $150 \times 10^9/L$ and classified as mild thrombocytopenia and 112 women who had platelet count $<100 \times 109/L$ were taken as study group. GT was the most common etiology in both groups and associated with very few adverse fetomaternal outcomes in their study.^[3] Parnas et al. observed incidence of GT of 59.3% in their study group. Platelet counts normalize within 2–12 weeks following delivery.^[8] Burrows and Kelton reported that all women with GT had normal or normalizing platelet counts in postpartum period.^[5] In this study, platelet counts normalize on follow-up visit at 6 weeks.

Conclusion

GT is usually mild or moderate, but we have found

a significant number of severe cases also. Severe thrombocytopenia should be investigated to exclude other causes of thrombocytopenia in pregnancy such as preeclampsia. Care should be taken during delivery of women with thrombocytopenia, especially if severe to avoid bleeding complications.

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Conflicts of interest

There are no conflicts of interest.

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