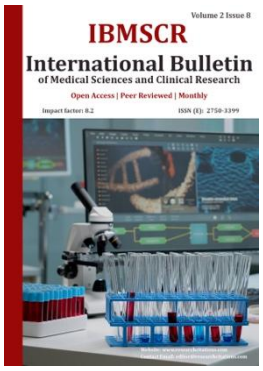

THE ROLE OF THROMBOCYTOPENIA IN POSTPARTUM HEMORRHAGE: CLINICAL IMPLICATIONS

Poziljonova Dilnozakhon Uktamjon qizi
Assistant,
Andijan State Medical Institute
poziljonovadilnozahon@gmail.com
91-618-21-31
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Annotation:

This review highlights the role of thrombocytopenia in postpartum hemorrhage (PPH), a leading cause of maternal mortality. It explains how reduced platelet counts—caused by gestational, hypertensive, immune, or coagulation disorders—impair hemostasis and increase bleeding risk during delivery. The paper emphasizes early diagnosis, continuous platelet monitoring, and multidisciplinary management to improve maternal outcomes.

Keywords:

Thrombocytopenia, postpartum hemorrhage, pregnancy, platelets, maternal health, hemostasis, monitoring.

Abstract

Postpartum hemorrhage (PPH) remains one of the leading causes of maternal morbidity and mortality worldwide. While uterine atony and trauma are primary contributors, hematological disorders, particularly thrombocytopenia, play a critical role in exacerbating bleeding risk during labor and delivery. Thrombocytopenia, defined as a platelet count below 150×10^9/L, can arise from gestational physiological changes, hypertensive disorders such as preeclampsia, immune-mediated mechanisms, or disseminated intravascular coagulation (DIC). This review discusses the pathophysiology of thrombocytopenia in pregnancy, its impact on hemostasis, clinical consequences in the context of PPH, and current management strategies to improve maternal outcomes.

Introduction

Postpartum hemorrhage is defined as blood loss exceeding 500 mL following vaginal delivery or 1000 mL after cesarean section. It accounts for a significant proportion of preventable maternal deaths. The multifactorial etiology includes uterine atony, birth canal trauma, retained placental tissue, and coagulation abnormalities. Among coagulation disorders, thrombocytopenia is particularly important, as platelets are central to primary hemostasis. Understanding the relationship between low platelet counts and PPH is crucial for timely diagnosis and effective management.

Role of Platelets in Hemostasis During Pregnancy and Labor

Platelets maintain vascular integrity and initiate clot formation at sites of endothelial injury. During pregnancy, hemostatic balance shifts toward a prothrombotic state to prevent excessive bleeding at delivery. Platelets adhere to damaged vascular surfaces, aggregate, and recruit coagulation factors to form a stable clot. In thrombocytopenia, this process is impaired, resulting in prolonged bleeding and higher risk of hemorrhage.

Pathophysiology of Thrombocytopenia in Pregnancy

Several mechanisms underlie thrombocytopenia in pregnant women:
- "Gestational thrombocytopenia": A benign condition occurring in 5–10% of pregnancies, usually mild and asymptomatic.
- "Hypertensive disorders (preeclampsia, HELLP syndrome)": Platelet consumption due to endothelial dysfunction and microangiopathy.
- "Immune thrombocytopenia (ITP)": Autoantibody-mediated platelet destruction, which may worsen during pregnancy.
- "Disseminated intravascular coagulation (DIC)": A severe complication of obstetric emergencies, leading to rapid platelet consumption.

Each of these conditions has unique clinical implications for labor and delivery.

Clinical Impact of Thrombocytopenia on Postpartum Hemorrhage

Thrombocytopenia significantly increases the risk of uncontrolled bleeding during and after delivery. Women with platelet counts below 100×10^9/L have impaired clot formation, and severe thrombocytopenia ($<50 \times 10^9$/L) is strongly associated with major PPH. Clinical outcomes include:
- Increased transfusion requirements.
- Higher risk of surgical interventions such as hysterectomy.
- Prolonged maternal recovery and increased morbidity.
- In severe cases, maternal mortality.

Diagnostic and Monitoring Strategies

Early detection of thrombocytopenia is critical. Diagnostic approaches include:
- Complete blood count (CBC) with platelet count.
- Peripheral smear for morphological assessment.
- Coagulation profile to detect associated coagulopathies.
- Monitoring in high-risk pregnancies (preeclampsia, ITP, HELLP syndrome).

Close surveillance of platelet trends throughout pregnancy allows for timely intervention during delivery.

Management ApproachesManagement of thrombocytopenia in the context of PPH involves:
- "Prophylactic planning": Identifying women at risk during antenatal care.
- "Pharmacological therapy": Corticosteroids or intravenous immunoglobulin (IVIG) in ITP.
- "Platelet transfusion": Recommended when platelet counts fall below 50×10^9/L prior to cesarean section or active bleeding.
- "Correction of underlying conditions": Managing preeclampsia, HELLP syndrome, or sepsis.
- "Multidisciplinary approach": Collaboration between obstetricians, hematologists, and anesthesiologists.

Discussion

Thrombocytopenia remains a significant risk factor for postpartum hemorrhage. Although gestational thrombocytopenia is often benign, other causes such as ITP and DIC present major challenges. Emerging evidence suggests that functional platelet defects, in addition to low counts, contribute to hemorrhagic risk. Further research is needed to establish

standardized guidelines for monitoring and intervention in pregnant women with thrombocytopenia to reduce maternal morbidity and mortality.

Conclusion

Thrombocytopenia is an important hematological factor influencing postpartum hemorrhage. Recognition of its pathophysiological mechanisms and clinical implications is essential for effective management. Early diagnosis, risk stratification, and prompt intervention can significantly improve maternal outcomes. Future studies should focus on refining monitoring protocols and optimizing therapeutic strategies.

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