INTERNATIONAL MULTIDISCIPLINARY JOURNAL FOR RESEARCH & DEVELOPMENT
SJIF 2019: 5.222 2020: 5.552 2021: 5.637 2022:5.479 2023:6.563 2024: 7,805
eISSN :2394-6334 https://www.ijmrd.in/index.php/imjrd Volume 11, issue 09 (2024)

THE IMPORTANCE OF RETRACTION OF BLOOD CLOT IN DIAGNOSING THROMBOCYTOPENIC PURPURA IN WOMEN OF CHILDBEARING AGE

Abdiev Kattabek Makhmatovich,
PhD, Associate Professor of the Department of Hematology, SamSMU.
Surkhanova Shahlo Olimjon qizi,
student of group 401, Faculty of Medical Biology, SamSMU.
Rajabova Khilola Bakhtiyor qizi, student of group 401, Faculty of Medical Biology, SamSMU.
Uraimjanov Rahmatillo Olimjon ugli
student of group 401, Faculty of Medical Biology, SamSMU.

Abstract: Thrombocytopenic purpura is a hematological disorder characterized by a low platelet count, leading to increased bleeding risks. This article explores the importance of blood clot retraction in diagnosing thrombocytopenic purpura, particularly in women of childbearing age, who may be at higher risk due to pregnancy and related complications. Understanding clot retraction can provide valuable insights into the underlying pathology of thrombocytopenic purpura and guide clinical management.

Key words: Thrombocytopenic purpura, blood clot retraction, diagnosis, platelet function, women of childbearing age, immune thrombocytopenic purpura, hemostasis, bleeding risks, pregnancy complications, platelet count, clinical management, pathophysiology, hematological disorders, secondary thrombocytopenia, obstetric risks.

Introduction

Thrombocytopenic purpura is a hematological disorder characterized by an abnormally low platelet count, leading to an increased risk of bleeding and bruising. This condition can significantly affect the quality of life and may pose serious health risks, particularly in women of childbearing age. The prevalence of thrombocytopenia in this demographic is concerning, as it can arise from various etiologies, including immune-mediated destruction of platelets, infections, medications, and bone marrow disorders. The accurate diagnosis of thrombocytopenic purpura is crucial for determining appropriate treatment strategies and ensuring patient safety, especially during pregnancy and childbirth. One critical aspect of this diagnostic process is the assessment of blood clot retraction, a physiological mechanism that reflects platelet functionality. Blood clot retraction involves the contraction of platelets within a fibrin matrix, leading to the stabilization and consolidation of the clot. Understanding the importance of clot retraction can provide valuable insights into the underlying mechanisms of thrombocytopenic purpura, helping clinicians differentiate between various types and guiding management approaches. This is particularly relevant for women of childbearing age, who face unique physiological changes and potential complications during pregnancy that can exacerbate the risks associated with thrombocytopenia.

This article explores the significance of blood clot retraction in diagnosing thrombocytopenic purpura, emphasizing its clinical implications and the need for thorough evaluation in women of reproductive age to optimize patient outcomes and minimize complications.

Materials and Methods

Study Design: This cross-sectional study was conducted over a period of 12 months at a tertiary care hospital. The study aimed to evaluate the relationship between blood clot retraction and the diagnosis of thrombocytopenic purpura in women of childbearing age.

Participants: The study included 100 women aged 18 to 45 years who presented with symptoms of thrombocytopenic purpura. Participants were recruited from the hematology clinic and were diagnosed based on clinical examination and laboratory tests. Exclusion criteria included:
- Recent blood transfusion (within the last 3 months)
- History of hematologic malignancies
- Chronic liver or kidney disease
- Use of anticoagulant medications

Sample Size: The sample size was determined based on a preliminary study that estimated a thrombocytopenic prevalence of 5% in women of childbearing age. Using a confidence level of 95% and a margin of error of 5%, a total of 100 participants were deemed sufficient.

Laboratory Methods

Platelet Count: A complete blood count (CBC) was performed for each participant using an automated hematology analyzer. Platelet counts were categorized into three groups:
- Mild thrombocytopenia: 100,000 – 150,000/µL
- Moderate thrombocytopenia: 50,000 – 99,000/µL
- Severe thrombocytopenia: <50,000/µL

Clot Retraction Assessment:
- Blood samples (5 mL) were collected in citrated tubes and were allowed to clot at room temperature for 1 hour.
- After clot formation, the samples were centrifuged at 2000 RPM for 10 minutes to separate serum and the clot.
- Clot retraction was evaluated visually and categorized into three levels:
  - Normal retraction (≥50%)
  - Reduced retraction (25% - 49%)
  - Absent retraction (<25%)

Bleeding Time Measurement: The bleeding time was measured using a standardized method. A small incision was made on the forearm, and the time taken for bleeding to stop was recorded. Values exceeding 10 minutes were considered prolonged.

Clinical Evaluation: Participants were assessed for clinical manifestations of thrombocytopenic purpura, including:
- Bruising Episodes: Number of bruising episodes experienced in the last month.
- Petechiae: Presence or absence of petechial rash.
- Postpartum Hemorrhage: Documented in pregnant participants.

Statistical Analysis: Data were analyzed using SPSS version 25.0. Descriptive statistics, including means and standard deviations, were calculated for continuous variables, while categorical variables were expressed as frequencies and percentages. The Pearson correlation coefficient was used to assess the relationship between platelet count and clot retraction. A p-value of <0.05 was considered statistically significant.

Ethical Considerations: The study protocol was approved by the Institutional Review Board of the hospital. Informed consent was obtained from all participants prior to inclusion in the study. Data confidentiality was maintained throughout the study.

Results and Discussion

Results

Participant Characteristics: A total of 100 women of childbearing age were included in the study. The mean age of the participants was 30.5 years, with a range from 18 to 45 years. The mean platelet count across the cohort was 85.4 × 10^3/µL, with a standard deviation of 25.3. Among the participants, 30% had platelet counts less than 50,000/µL, 25% had counts between 50,000 and 100,000/µL, and 45% had counts between 100,000 and 150,000/µL.

Clot Retraction Findings: Clot retraction was categorized as follows: 40% of the participants exhibited normal retraction, 35% showed reduced retraction, and 25% had absent retraction. A significant negative correlation was observed between platelet count and the degree of clot retraction, with a Pearson's correlation coefficient of -0.65 ($p < 0.001$).

Clinical Outcomes: The clinical manifestations of thrombocytopenic purpura varied based on the clot retraction status. Participants with normal retraction experienced an average of 1.5 bruising episodes, while those with reduced retraction had an average of 3.8 episodes, and those with absent retraction reported an average of 5.6 episodes. Furthermore, the incidence of petechiae was noted, with 5 cases in the normal retraction group, 15 in the reduced retraction group, and 20 in the absent retraction group. Participants with absent or reduced clot retraction also experienced significantly longer bleeding times compared to those with normal retraction ($p < 0.05$).

Pregnancy-Related Findings: Among the 30 participants who were pregnant or had recently given birth, 70% exhibited absent or reduced clot retraction during the third trimester, while 60% of those who were recently postpartum demonstrated similar results. The incidence of postpartum hemorrhage was significantly higher in this group, with 5 cases reported among pregnant women with impaired clot retraction and 4 cases among recently postpartum women. The difference in postpartum hemorrhage incidence was statistically significant ($p < 0.01$).

Discussion

Role of Clot Retraction in Thrombocytopenic Purpura Diagnosis: The findings of this study underscore the significant relationship between platelet count and blood clot retraction, indicating that clot retraction is a valuable diagnostic marker for assessing the severity of thrombocytopenic purpura. The observed correlation, with a Pearson's coefficient of -0.65, confirms that lower platelet counts are associated with impaired clot retraction.

Implications for Women of Childbearing Age: For women of childbearing age, these results carry critical implications, particularly in the context of pregnancy. The higher incidence of bruising, petechiae, and prolonged bleeding times among participants with reduced or absent clot retraction emphasizes the importance of incorporating clot retraction assessment into routine clinical practice. Women with impaired clot retraction face increased risks of bleeding complications during pregnancy and childbirth, highlighting the need for early detection and management of thrombocytopenic conditions.

Clinical Utility and Future Directions: This study advocates for the routine use of clot retraction testing in women suspected of having thrombocytopenic purpura. The trends observed suggest that reduced or absent clot retraction correlates with a higher likelihood of clinical complications, indicating the necessity for more vigilant monitoring and potentially more aggressive treatment approaches.

Future research should focus on elucidating the relationship between clot retraction and the underlying causes of thrombocytopenia, as well as evaluating its prognostic value in predicting adverse outcomes in pregnant women. This could enhance our understanding of thrombocytopenia management and improve patient outcomes in this vulnerable population.

Conclusion

In conclusion, this study highlights the critical importance of blood clot retraction in diagnosing thrombocytopenic purpura in women of childbearing age. The findings demonstrate a significant negative correlation between platelet count and the degree of clot retraction, indicating that impaired clot retraction is associated with more severe clinical manifestations, including increased bruising, petechiae, and prolonged bleeding times. The results underscore the necessity for healthcare providers to incorporate clot retraction assessments into routine evaluations for women suspected of having thrombocytopenic purpura. Given the heightened risks associated with

pregnancy, including postpartum hemorrhage, early identification and management of thrombocytopenic conditions are paramount for improving maternal health outcomes. Clot retraction serves as a valuable diagnostic and prognostic tool in the management of thrombocytopenic purpura, highlighting the need for further research to explore its implications in various clinical contexts, particularly for women during pregnancy and childbirth.

References:

1. Bacigalupo. A., Van Lint, M. T. (2019). Thrombocytopenia in pregnancy: Epidemiology and management. *Hematology Reviews*, 1(1), 25-34.
2. Friedman. M., Mahr. M. (2017). Thrombocytopenic purpura: Clinical and laboratory findings. *American Journal of Hematology*, 92(2), 154-158.
3. Heit. J. A., Cohen. A. T. (2018). The role of thrombosis in pregnancy: A critical review. *Thrombosis Research*, 171, 144-150.
4. Lindgren.A., Olsson. M. L. (2020). The relationship between platelet function and bleeding tendency in thrombocytopenia. *Journal of Thrombosis and Haemostasis*, 18(4), 924-930.
5. Mehta. S. R., Whisnant. J. P. (2016). Assessing the clinical significance of clot retraction in thrombocytopenic patients. *British Journal of Haematology*, 173(5), 812-818.
6. Narang. I., Jain. M. (2019). Pregnancy-related thrombocytopenia: A comprehensive review. *Indian Journal of Hematology and Blood Transfusion*, 35(1), 15-20.
7. Parker. S. M., McKenzie. A. C. (2021). Thrombocytopenia in women of reproductive age: Clinical implications. *International Journal of Women's Health*, 13, 299-308.
8. Raza. A., Majeed. A. (2020). Evaluation of platelet function tests in the diagnosis of thrombocytopenic purpura. *Journal of Clinical Pathology*, 73(5), 279-284.
9. Tzeng. S. H., Chen. Y. J. (2022). The significance of clot retraction testing in the management of thrombocytopenia: A review. *Journal of Blood Medicine*, 13, 217-224.
10. Zhou. H., Liu. Y. (2018). Thrombocytopenia and pregnancy: The role of clinical assessment and management strategies. *Journal of Maternal-Fetal & Neonatal Medicine*, 31(10), 1390-1395. Doi:10.1080/14767058.2017.1333869.
11. Абдиев, К., Махмонов, Л., Мадашева, А., & Маматкулова, Ф. (2021). Business games in teaching hematology. Общество и инновации, 2(6), 208-214
12. Abdiev, K. M., Makhmonov, L. S., Madasheva, O. G., & Berdiyarova, M. B. The main causes of anemia in patients with diseases of the colon. Scientist Of The XXI Century, 12;
13. Abdiev K.M, et al. Modern methods of treatment of hemorrhagic syndrome at an early stage in patients with idiopathic thrombocytopenic purpura // Ученый XXI века — 2021, — № 1- 1—P.41–44 (72);
14. Мадашева, А. Г., & Махмудова, А. Д. (2021). Биохимические показатели у больных гемофилией с мышечными патологиями до и после лечения. Форум молодых ученых, (4 (56)), 233-238.
15. Gazkhanovna, M. A., Makhmatovich, A. K., & Utkirovich, D. U. (2022). Clinical efficacy of extracorporeal and intravascular hemocorrection methods in psoriasis. ACADEMICIA: An International Multidisciplinary Research Journal, 12(2), 313-318.
16. Мадашева, А. Г. (2022). Коррекция диффузной алопеции при железодефицитной анемии. Science and Education, 3(12), 231-236.
17. Мадашева, А. Г. (2022). Клинико-неврологические изменения у больных гемофилией с мышечными патологиями. Science and Education, 3(12), 175-181.
18. Мадашева, А. Г., & Жураева, М. З. (2019). Биохимические показатели и комплексное лечение больных псориазом с лечебным плазмаферезом. Достижения науки и образования, (10 (51)), 78-82.

19. Махмудова АН. Правовая защита пациентов в сфере здравоохраения в новом Узбекистане. Academic research in educational sciences. 2022(1):102-7.
20. Махмудова АН, Махмудова С. Гуманитаризация медицинского образования как фактор повышения качества обучения в вузе. Science and Education. 2022;3(6):709-18.]
21. O'tayev ST, Mahmudova AN. O'zbekiston Respublikasining sog'liqni saqlash tizimida hozirgi kunda neyroxirurgiya yutuqlari. Science and Education. 2023;4(2):190-4