Original Article

EVALUATION OF CORRELATION BETWEEN COMPLICATIONS AND PLATELET INDICES IN PATIENTS WITH DENGUE FEVER: A PROSPECTIVE OBSERVATIONAL STUDY

Dr. Shailja Khansili[1], Dr. Amit Verma[2]

[1] Assistant professor, Department of General Medicine, Shri Guru Ram Rai Institute of Medical and Health Sciences, Dehradun, Uttarakhand, India

[2] Professor, Department of General Medicine, Shri Guru Ram Rai Institute of Medical and Health Sciences, Dehradun, Uttarakhand, India

🔓 OPEN ACCESS

Corresponding Author:

Dr. Shailja Khansili

Assistant professor, Department of General Medicine, Shri Guru Ram Rai Institute of Medical and Health Sciences, Dehradun, Uttarakhand, India

A B S T R A C T

Background: Dengue fever is one of the major mosquito-borne viral illnesses. It is associated with significant morbidity due to plasma leakage and hemorrhagic complications. For predicting disease severity, platelet indices have been suggested as a surrogate marker.

Objective: To evaluate the correlation between platelet indices and clinical complications in patients with dengue fever.

Materials and Methods: In this prospective study, we included 200 patients admitted with clinically suspected and serologically confirmed dengue fever to a tertiary care hospital in Dehradun, Uttarakhand, India, between the time period of August 2020 and August 2021. Platelet indices including platelet count, mean platelet volume (MPV), platelet distribution with (PDW), and plateletcrit (PCT) were analyzed using an automated hematology analyzer. Patients were assessed for complications such as ascites, pleural effusion, and hemorrhagic manifestations. Data were analyzed descriptively to assess correlations.

Results: Out of 200 patients, hemorrhagic complications were observed in 53 patients. Complications such as ascites and pleural effusion were noted in 11 and 7 patients, respectively. In patients with MPV between 9-12.95 fL, PDW >14 fL, platelet count <50,000/cu mm, and plateletcrit <0.20%, a higher frequency of complications was noted. Petechiae were noted in 38 cases and melena was noted in 21 cases, they were the most common hemorrhagic manifestations.

Conclusion: Platelet indices demonstrate a meaningful association with complications in dengue fever and may serve as accessible markers for early risk stratification in clinical practice.

Keywords: Dengue fever; Platelet indices; Platelet distribution width; Mean platelet volume; Hemorrhagic complications.

INTRODUCTION

Dengue fever is one of the major mosquito-borne viral infections caused by the dengue virus and represents a significant public health challenge in tropical and subtropical countries. Dengue's clinical spectrum ranges from a self-limiting febrile illness to severe dengue characterized by plasma leakage, hemorrhagic manifestations, and organ dysfunction.[1]

One of the hallmark laboratory abnormality in dengue infection is thrombocytopenia; however, platelet count alone does not reliably predict disease severity or bleeding risk.[2] In the recent times, interest has focused on platelet indices such as mean platelet volume (MPV), platelet distribution width (PDW), and plateletcrit (PCT), which reflect platelet activation, size variability, and circulating platelet mass.[3-5] These indices are readily available from automated hematology analyzers and may provide significant additional prognostic information.

Dr. Shailja Khansili *et al.* Evaluation of Correlation Between Complications and Platelet Indices in Patients with Dengue Fever: A Prospective Observational Study. *Int. J Med. Pharm. Res., 7 (1): 911-913, 2026*

911

The present study was done to evaluate the correlation between platelet indices and clinical complications in patients with dengue fever admitted to a tertiary care hospital in northern India.

Materials and Methods

Study design and setting
This was a prospective observational study conducted in the Department of General Medicine, Shri Guru Ram Rai Institute of Medical and Health Sciences, Shri Mahant Indiresh Hospital, Dehradun, Uttarakhand, India.

Study population
A total of 200 patients admitted between August 2020, and August 2021 were included in the study.

Inclusion criteria
- Patients with clinical features suggestive of dengue fever as per WHO definition.
- Serologically confirmed patients of dengue fever by NS1 antigen and/or IgM antibody to dengue virus by ELISA.
- Age ≥ 18 years.

Exclusion criteria
- Patients with known hematological disorders.
- Patients already on antiplatelet or anticoagulant therapy.
- Co-existing infections known to affect platelet parameters.

Data collection
Detailed clinical evaluation of all patients were performed. Complication like Ascites, Pleural effusion, hemorrhagic manifestations (petechiae, gum bleeding, melena, menorrhagia, hemoptysis, hematemesis) were included.
Platelet indices such as platelet count, MPV, PDW, and plateletcrit were measured using an automated hematology analyzer at the time of admission and during hospital stay.

Statistical Analysis
Data interpreted was entered in Microsoft Excel and was analyzed using appropriate statistical methods. Categorical variables were expressed as frequencies and percentages. Associations between platelet indices and complications were assessed using descriptive and comparative analysis. A p-value of <0.05 was considered statistically significant.

Results

Distribution of complications according to platelet indices

Mean platelet volume (MPV)
Patients having MPV between 9-12.95 fL form the majority of cases (149 cases). Ascites was there in 9 cases, pleural effusion in 6 cases, and hemorrhagic complications in 43 cases, these were most frequently observed in this group. Patients with MPV >12.95 fL also showed hemorrhagic manifestations, though they were very few in numbers.

Platelet distribution width (PDW)
A higher number of complications were observed in patients having PDW values > 14 fL
Hemorrhagic complications were seen in 34 patients in this group, compared to 19 patients with PDW values between 9-14 fL.

Platelet count
Hemorrhagic complications were the most observed complications in patients with platelet counts below 50,000/cu mm. petechiae and melena were the predominant manifestations. With the increment of platelet counts, the frequency and severity of hemorrhagic manifestations decreased significantly.

Plateletcrit (PCT)
All hemorrhagic complications were observed in patients with plateletcrit <0.20%. With plateletcrit ≥0.20%, there were no complications.

Pattern of hemorrhagic manifestations
Among 53 patients with hemorrhagic complications: - Petechiae (38 cases), Gum bleeding (12 cases), Melena (21 cases), Menorrhagia (3 cases), Hemoptysis (2 cases), hematemesis (1 case).
Petechiae and melena were the most common hemorrhagic manifestations among all platelet indices categories.

Discussion
This prospective observational study evaluated the association between platelet indices and clinical complications in dengue fever. Most frequent complication was hemorrhagic manifestations, followed by ascites and pleural effusion.

A higher incidence of complications was observed in patients with elevated MPV and PDW values. Increased MPV values reflect enhanced platelet turnover and release of younger, immature, larger platelets from the bone marrow in response to peripheral destruction, which has been associated with severe dengue in previous studies.[6-8]Likewise, elevated PDW indicates increased heterogeneity in platelet size and has been linked to platelet activation and consumption.

Plateletcrit emerged as a strong marker of hemorrhagic risk in the present study, with all bleeding manifestations occurring in patient with PCT<0.20%. This finding underscores the importance of total circulating platelet mass rather than platelet count alone in predicting bleeding complications.[9-10]

The results of this study showed the utility of platelet indices as simple, cost-effective parameters that can assist clinicians in early identification of patients at risk of developing complications.

Conclusion
Platelet indices including MPV, PDW, platelet count, and plateletcrit show a clear association with complications in dengue fever. These readily available hematological parameters may aid in early risk stratification and guide closer monitoring of patients with dengue viral infection.

Limitations
This study was done at a single center, which may limit the generalizability of the findings. Inferential statistical analysis was not performed, and serial monitoring of platelet indices was not uniformly available for all patients.

Recommendations
Further multicentric studies with larger sample sizes and serial monitoring of platelet indices are recommended to validate their prognostic utility in dengue fever.

REFERENCES
1. World Health Organization. *Dengue: Guidelines for Diagnosis, Treatment, Prevention and Control*. WHO Press; 2009.
2. Kalayanarooj S, Vaughn DW, Nimmannitya S, et al. Early clinical and laboratory indicators of acute dengue illness. *J Infect Dis*. 1997;176(2):313–321.
3. Bashir AB, Saeed OK, Mohammed BA, Ageep AK. Role of platelet indices in patients with dengue infection. *Int J Lab Hematol*. 2015;37(3):e45–e48.
4. Mammen EF. Platelet indices in health and disease. *Clin Lab Med*. 1993;13(2):361–372.
5. Katti TV, Mhetre SC, Annigeri C. Mean platelet volume and platelet distribution width in patients with dengue fever: A prospective study. *Int J Adv Med*. 2016;3(3):579–582.
6. Wiwanitkit V. Mean platelet volume in the patients with dengue hemorrhagic fever. *Platelets*. 2004;15(3):185.
7. Dewi R, Tjitra E, Sudjana P, et al. Platelet indices as severity markers in dengue infection. *Southeast Asian J Trop Med Public Health*. 2013;44(2):215–223.
8. Navya BN, Patil S, Kariappa TM. Platelet indices in dengue fever: A clinical study. *J Evid Based Med Healthc*. 2017;4(83):4891–4895.
9. Banerjee A, Chatterjee S. Plateletcrit as a prognostic marker in dengue fever. *J Assoc Physicians India*. 2018;66(6):52–56.
10. Chaudhary R, Khetan D, Sinha S, et al. Transfusion support in dengue fever. *Asian J Transfus Sci*. 2010;4(1):8–13.

Dr. Shailja Khansili *et al.* Evaluation of Correlation Between Complications and Platelet Indices in Patients with Dengue Fever: A Prospective Observational Study. *Int. J Med. Pharm. Res., 7 (1): 911-913, 2026*

913