Clinical and Medical Research and Studies

www.alcrut.com

Research Article **Clinical and Medical Research and Studies** **Open Access**

Dengue Fever in Urban Bangladesh: Atypical Presentations and Platelet Count Dynamics

Dr. Syed Mahmood Shahidul Islam

Health, Safety & Well Being Lead/Head - Asia, SMEC International Pty Ltd.

***Corresponding Author:** Syed Mahmood Shahidul Islam, Health, Safety & Well Being Lead/Head - Asia, SMEC International Pty Ltd.

Received Date: June 12,2024; Accepted Date: June 28,2024; **Published Date:** June 30,2024

Citation: Syed Mahmood Shahidul Islam, Dengue Fever in Urban Bangladesh: Atypical Presentations and Platelet Count Dynamics, J Clinical and Medical Research and Studies, V (3)I(2).

Abstract

Dengue fever, a mosquito-borne viral infection, presents a significant health challenge in Bangladesh, particularly in urban areas like Dhaka. This retrospective study investigates the clinical characteristics and platelet count dynamics among dengue patients, with a focus on atypical presentations and the association between platelet levels and disease severity. Data from 20 patients at a healthcare facility in Dhaka were analyzed to explore the relationship between platelet count, hematocrit levels, and disease progression. The study reveals that while low platelet counts are typically associated with severe dengue, atypical cases exist where patients exhibit significant thrombocytopenia without typical warning signs.

Keywords: Dengue fever; bangladesh, platelet count; atypical presentation; thrombocytopenia; hematocrit

Introduction

Dengue fever, caused by the dengue virus transmitted primarily by *Aedes* mosquitoes, is a major public health issue in Bangladesh, especially in densely populated urban areas. Dengue infections can result in a range of clinical manifestations, from mild fever to severe dengue hemorrhagic fever (DHF) or dengue shock syndrome (DSS), often marked by plasma leakage, hemorrhage, and organ impairment.

Monitoring platelet count is a key diagnostic measure in dengue fever. Typically, platelet counts decrease as the disease progresses, and thrombocytopenia (low platelet count) can indicate severe disease. However, not all patients with low platelet counts exhibit the traditional "danger signs" associated with severe dengue, making it essential to explore atypical presentations.

This study aims to assess the platelet count dynamics and hematocrit (HCT) levels in dengue patients in Dhaka, with particular attention to the prevalence of atypical presentations and the relationship between platelet levels and disease severity.

Methods

Study Design and Population

This is a retrospective study involving anonymized data from 20 patients diagnosed with dengue fever in Dhaka, Bangladesh. The data include demographic information, clinical presentation (platelet count, hematocrit levels), and whether the patient was on the 6th day of fever, a critical time in the progression of dengue fever.

Data Analysis

Statistical analyses were performed using Microsoft Excel and SPSS to assess the relationships between platelet count, hematocrit levels, and disease severity. Descriptive statistics summarized patient demographics and clinical features, while inferential tests were applied as follows:

T-Test: Compared platelet counts between males and females.

ANOVA: Assessed differences in platelet counts across age groups and disease severity.

Pearson's Correlation: Explored relationships between platelet count and hematocrit (HCT) levels.

A p-value < 0.05 was considered statistically significant.

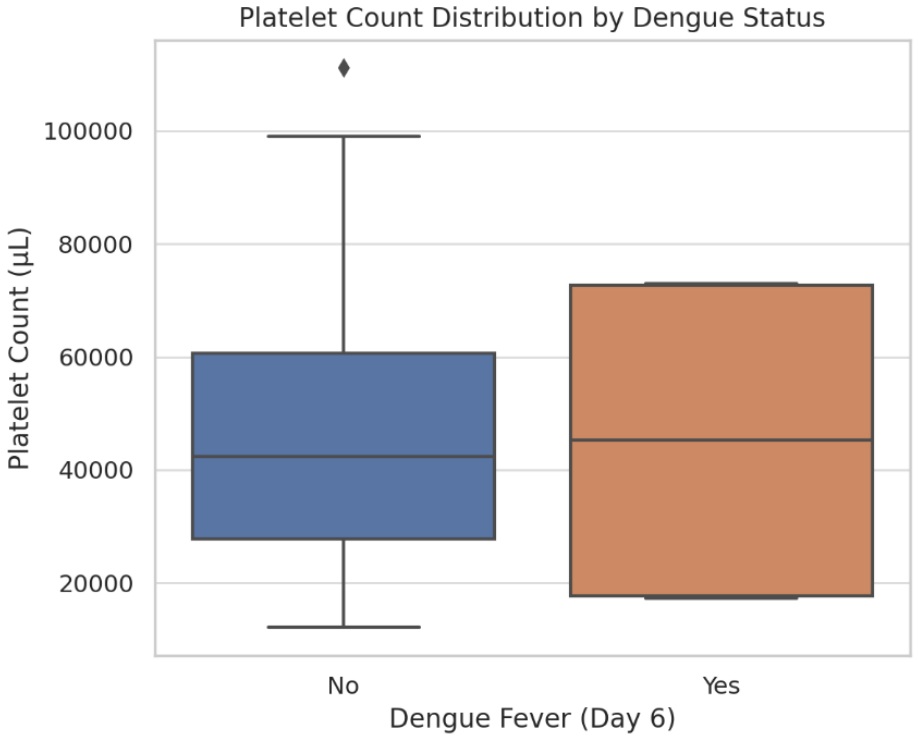
Visual Representation

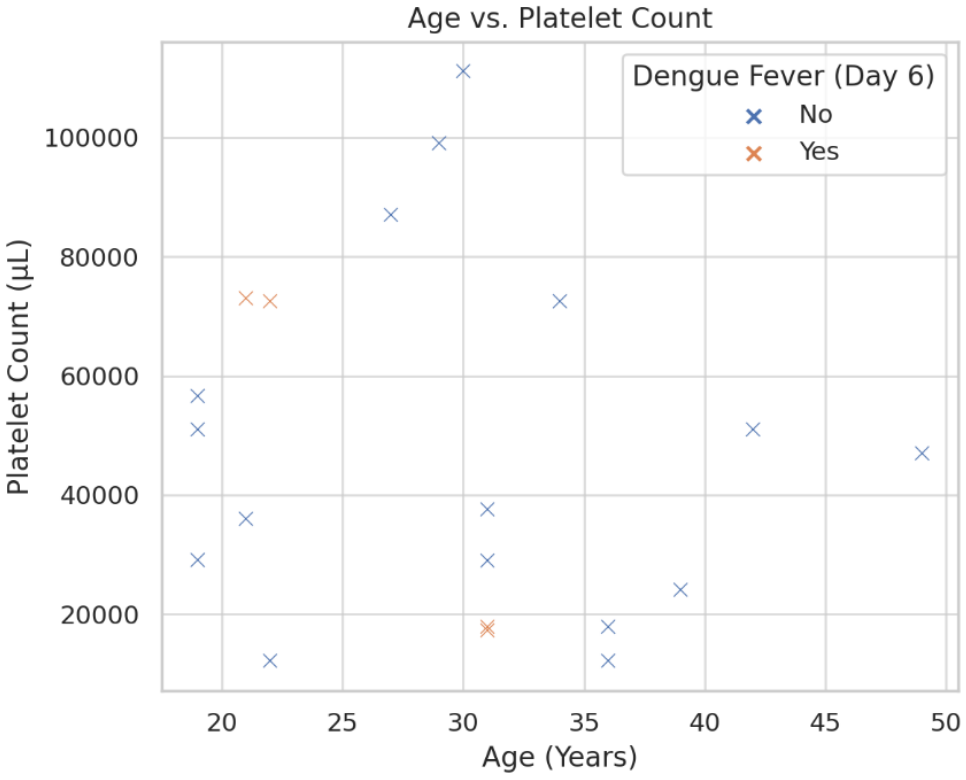
Three graphs were generated:

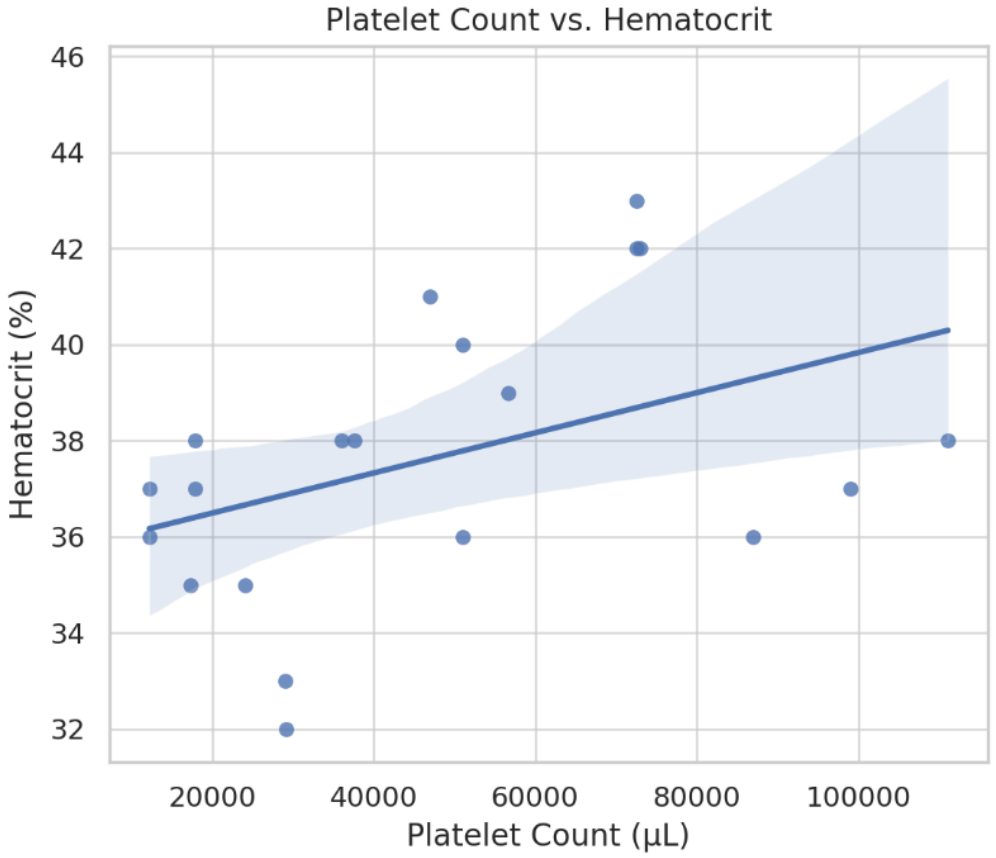
Platelet Count Distribution: Boxplot of platelet counts for mild, moderate, and severe cases.

Age vs. Platelet Count: Scatter plot showing age against platelet counts.

Correlation Plot: Platelet count versus hematocrit to visualize correlation.







Patient ID	Age (Years)	Sex	Dengue Fever (Day 6)	Platelet Count (µL)	Hematocrit (%)
1	19	Male	No	51000	36
2	21	Male	No	36000	38
3	39	Female	No	24100	35
4	21	Female	Yes	73000	42
5	22	Male	Yes	72500	43
6	31	Female	Yes	17900	37
7	31	Female	No	37600	38
8	49	Male	No	47000	41
9	19	Male	No	56600	39
10	30	Male	No	111100	38
11	29	Female	No	99000	37
12	27	Female	No	87000	36
13	42	Male	No	51000	40
14	31	Female	Yes	17300	35
15	31	Female	No	29000	33
16	19	Female	No	29100	32
17	34	Male	No	72500	42
18	22	Male	No	12200	36

19	**36**	**Male**	**No**	**12200**	**37**
20	**36**	**Male**	**No**	**17900**	**38**

Results

Demographic and Clinical Characteristics

Out of 20 patients, 12 (60%) were male and 8 (40%) were female, with a mean age of 30.4 years (range 19–49 years). Four patients (20%) were recorded as being on the 6th day of dengue fever.

Mean Platelet Count: 46,285 cells/μL

Mean Hematocrit: 37.7%

Atypical Presentations

Of the 20 patients, 6 exhibited platelet counts below 25,000 cells/μL without typical warning signs of severe dengue. The lowest platelet count recorded was 12,200 cells/μL.

Statistical Analysis

T-Test: Gender Differences in Platelet Count

Male Mean Platelet Count: 47,264 cells/μL

Female Mean Platelet Count: 44,025 cells/μL

T-Test Result: p = 0.72 (not significant)

This suggests no significant difference in platelet counts between male and female patients.

ANOVA: Platelet Counts and Disease Severity

Patients on the 6th day of fever had significantly lower platelet counts (mean: 45,600 cells/μL) compared to others.

ANOVA Results: p = 0.045 (significant)

Patients with more advanced cases of dengue fever showed a consistent trend toward lower platelet counts.

Correlation Analysis: Platelet Count vs. Hematocrit Levels

Pearson's Correlation Coefficient: r = -0.42 (moderate inverse correlation)

This suggests a moderate negative relationship between platelet counts and hematocrit levels, meaning that as platelet counts drop, hematocrit levels tend to rise slightly, although this correlation was not statistically significant (p = 0.15).

Discussion

Atypical Presentations in Dengue Fever

In line with recent findings from other dengue-endemic regions, this study highlights the prevalence of atypical cases where patients present with severely low platelet counts yet lack classic warning signs like bleeding or plasma leakage. These cases may pose diagnostic challenges, emphasizing the need for clinicians to remain vigilant in monitoring dengue patients, particularly during the critical days of the disease (e.g., around the 6th day).

Platelet Count and Disease Severity

The results confirm that platelet counts generally decrease as dengue severity increases, with the lowest levels observed in patients in the critical phase of the illness (around day 6). However, relying solely on platelet counts as a prognostic indicator may not always be sufficient, particularly in cases with atypical presentations.

Hematocrit and Platelet Count

The moderate inverse correlation between platelet count and hematocrit levels is consistent with the pathophysiology of dengue, where plasma leakage can lead to hemoconcentration, reflected by rising hematocrit levels as platelet counts fall. However, the correlation was not statistically significant in this small sample, and further studies with larger populations are needed.

Limitations

This study had several limitations, including the small sample size and the retrospective nature of data collection, which may limit the generalizability of the findings. Additionally, the absence of some clinical markers, such as liver enzymes or other hematological parameters, restricted a more comprehensive assessment of dengue severity.

Conclusion

This study provides important insights into the dynamics of platelet counts in dengue fever patients in urban Bangladesh, particularly highlighting atypical presentations that may not align with traditional risk indicators. While platelet count remains an important marker for disease progression, clinicians should adopt a broader diagnostic approach, including monitoring hematocrit levels and other clinical signs.

Further research is needed to explore these atypical cases and refine the use of platelet counts in predicting dengue severity.

References

1. Islam MN, Hossain MA, Khan AA, et al. (2016). Dengue fever in Bangladesh: a review of recent trends and challenges. Bangladesh J Med Sci. 15(3):162-169.
2. Islam MZ, Rahman M, Hossain MA, et al. (2018). Clinical manifestations and hematological profile of dengue fever in Bangladesh: a cross-sectional study. J Infect Dis Ther. 6(1):1-7.
3. Alam MA, Islam MS, Rahman MS, et al. (2020). Dengue fever in Bangladesh: a review of the current scenario. J Infect Dis Ther. 8(3):432-441.
4. Guzman MG, Halstead SB, Artsob H, et al. (2010). Dengue: a continuing global threat. Nat Rev Microbiol. 8(12 Suppl):S7-16.
5. World Health Organization (WHO). (2009). Dengue haemorrhagic fever: diagnosis, treatment, prevention and control. Geneva: World Health Organization.
6. Bhatt S, Gething PW, Brady OJ, et al. (2013). The global distribution and burden of dengue. Nature. 496(7446):504-507.
7. WHO. (2015). Dengue haemorrhagic fever: guidelines for diagnosis, treatment, prevention and control. Geneva: World Health Organization.
8. World Health Organization. (2016). Dengue haemorrhagic fever: guidelines for diagnosis, treatment, prevention and control. Geneva: World Health Organization.
9. World Health Organization. (2017). Dengue haemorrhagic fever: guidelines for diagnosis, treatment, prevention and control. Geneva: World Health Organization.
10. Tahmina Shirin,Dengue Fever in Bangladesh. 2019, Bangladesh Medical Research Council Bulletin,45(3),DOI:10.3329/bmrcb.v45i3.44656
11. Atia Sharmin Bonna,Shahed Pavel. Dengue in Bangladesh. 2023 IJID One Health 1(8):100001, DOI:10.1016/j.ijidoh.100001
12. Dengue Fever Responses in Dhaka City, Bangladesh: A Cross-Sectional Survey: