

Research Article

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

Syed Mahmood Shahidul Islam^{1*} 

¹Health, Safety and Well-Being Lead/Head - Asia, SMEC International Pvt Ltd., Bangladesh

*Correspondence author: Syed Mahmood Shahidul Islam, Health, Safety and Well-Being Lead/Head - Asia, SMEC International Pvt Ltd., Bangladesh;
Email: mahmoodshahidul@gmail.com

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Abstract

Dengue fever, an arboviral infection transmitted by Aedes mosquitoes, remains a significant public health challenge in urban Bangladesh, especially in densely populated areas like Dhaka. This retrospective study investigates atypical clinical manifestations and platelet count dynamics among dengue patients, analyzing the association between thrombocytopenia and disease severity. Twenty patients treated in Dhaka were analyzed for clinical and hematological markers, with a specific focus on atypical presentations and platelet-hematocrit correlations. The findings highlight that while thrombocytopenia is a well-established indicator of dengue severity, several patients with critically low platelet counts did not exhibit typical warning signs, necessitating a more nuanced clinical approach.

Keywords: Dengue Fever; Bangladesh; Thrombocytopenia; Platelet Count; Atypical Presentation; Hematocrit

Introduction

Dengue fever, caused by the dengue virus and primarily transmitted by Aedes aegypti and Aedes albopictus, is endemic in over 100 countries, with a substantial disease burden in Southeast Asia, including Bangladesh. Dengue manifests in a spectrum of symptoms ranging from mild febrile illness to severe forms such as Dengue Hemorrhagic Fever (DHF) and Dengue Shock Syndrome (DSS), both of which are associated with plasma leakage, hemorrhage and organ dysfunction [1]. The World Health Organization (WHO) categorizes severe dengue as a life-threatening condition requiring immediate medical intervention [2].

In Bangladesh, the rapid urbanization and inadequate mosquito control have exacerbated dengue outbreaks, particularly in cities like Dhaka [3]. The hallmark of severe dengue is a critical drop in platelet count, often accompanied by rising hematocrit due to plasma leakage. However, not all patients with thrombocytopenia show classic warning signs, complicating diagnosis and management [4].

This study aims to analyze platelet count dynamics and hematocrit levels among dengue patients in Dhaka, emphasizing atypical presentations that do not follow traditional clinical progression. By exploring these atypical cases, we seek to improve diagnostic and treatment strategies for dengue in urban settings.

Ethical Statement

The project did not meet the definition of human subject research under the purview of the IRB according to federal regulations and therefore was exempt.

Methods

Study Design and Population

This retrospective study analyzed anonymized data from 20 dengue patients treated at a healthcare facility in Dhaka, Bangladesh. The dataset included demographic information, platelet counts, hematocrit levels and whether the patient was on the 6th day of fever, which is considered a critical period in the disease's progression [5].

Data Analysis

The clinical data were subjected to statistical analysis using Microsoft Excel and SPSS software. Descriptive statistics summarized patient demographics and clinical characteristics, while inferential tests such as T-tests and ANOVA were employed to compare platelet counts across various groups. Pearson's correlation coefficient was used to assess the relationship between platelet counts and hematocrit levels. A significant level of $p < 0.05$ was applied.

Visual Representation

Three graphs were generated (Fig. 1, Table 1):

1. Platelet Count Distribution: Boxplot of platelet counts for mild, moderate and severe cases
2. Age vs. Platelet Count: Scatter plot showing age against platelet counts
3. Correlation Plot: Platelet count versus hematocrit to visualize correlation

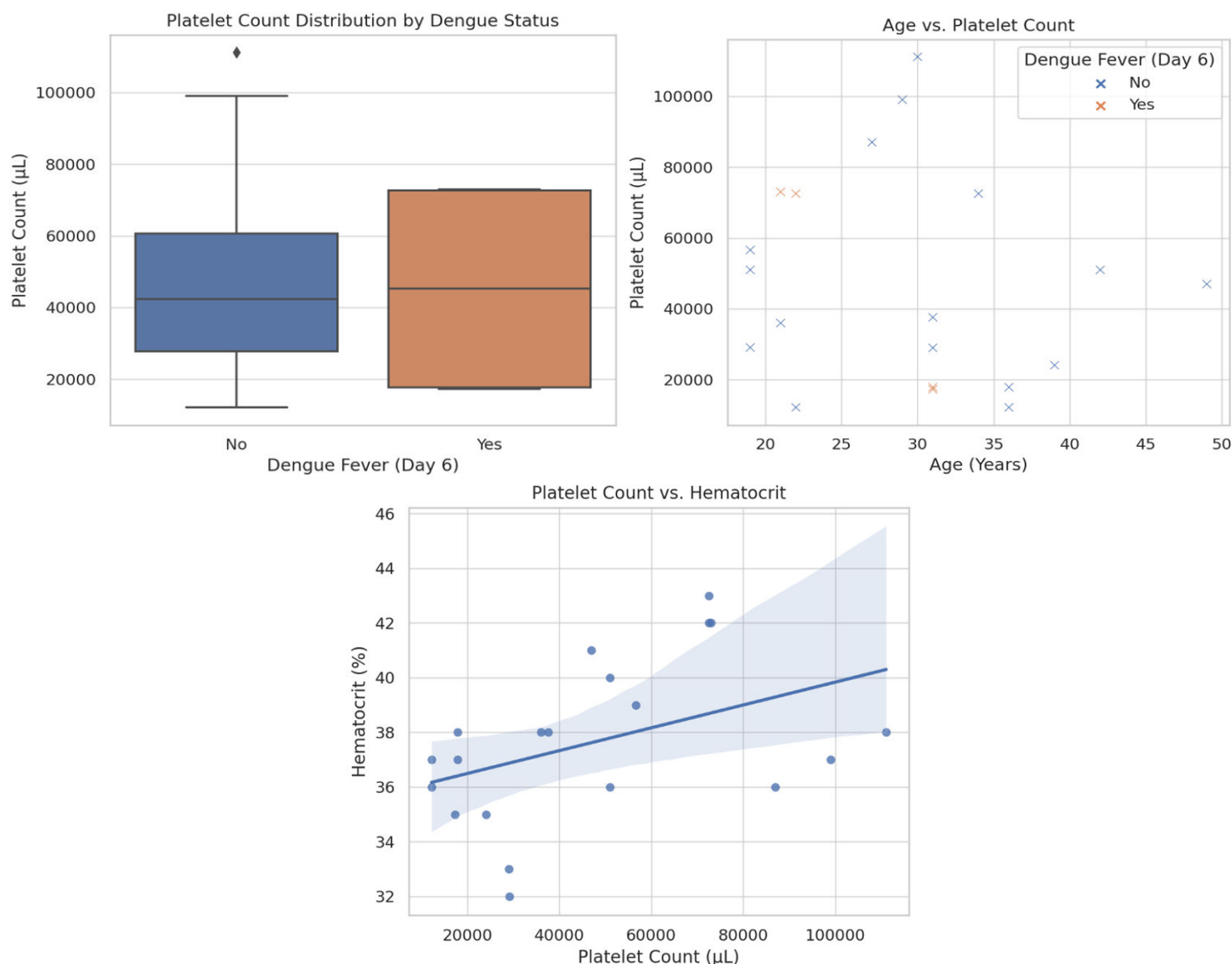


Figure 1: Visual representation of clinical data.

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

Table 1: Patients details explain platelet count distribution.

Results

Demographic and Clinical Characteristics

Among the 20 patients analyzed, 60% were male ($n=12$) and 40% were female ($n=8$), with a mean age of 30.4 years (range: 19–49 years). Four patients (20%) were recorded as being on the 6th day of fever. The mean platelet count across all patients was 46,285 cells/ μL and the mean hematocrit was 37.7%.

Atypical Presentations

Six patients exhibited platelet counts below 25,000 cells/ μL without the typical warning signs of severe dengue, such as hemorrhage or plasma leakage. The lowest recorded platelet count was 12,200 cells/ μL in two patients, neither of whom presented with significant warning signs.

Statistical Analysis

T-Test: The average platelet count among males (47,264 cells/ μL) was not significantly different from females (44,025 cells/ μL), with a p-value of 0.72, indicating no gender-based differences.

ANOVA: Significant differences were observed in platelet counts across disease severity levels ($p = 0.045$). Patients in more severe stages exhibited consistently lower platelet counts.

Pearson's Correlation: A moderate inverse correlation ($r = -0.42$) between platelet counts and hematocrit levels was observed, suggesting that as platelet counts drop, hematocrit levels rise slightly. However, this correlation was not statistically significant ($p = 0.15$).

Discussion

Dengue fever remains a critical public health concern in urban Bangladesh, particularly in Dhaka where dense populations and inadequate vector control facilitate transmission [6]. The findings of this study underscore the importance of vigilant monitoring of platelet counts during the course of dengue infection, particularly around the critical phase on day 6 of illness.

Several patients with severe thrombocytopenia (platelet counts below 25,000 cells/ μ L) did not exhibit typical warning signs such as bleeding, which highlights the complexity of dengue pathophysiology and the challenge in predicting disease [6]. Similar findings have been reported in other dengue-endemic regions, suggesting that atypical presentations may be more common than previously understood [1]. These cases complicate the clinical decision-making process, as the absence of warning signs may lead to delays in appropriate medical intervention.

The moderate inverse correlation between platelet count and hematocrit levels supports the hypothesis that plasma leakage, which leads to hemoconcentration, may not always be accompanied by dramatic changes in clinical symptoms [7]. Hematocrit monitoring, in conjunction with platelet count, may provide a more reliable indicator of disease progression in these atypical cases.

Conclusion

This study has contributed to a better understanding of the dynamics of platelet count and hematocrit levels in dengue fever patients, particularly in the context of atypical presentations. While platelet count remains a critical marker of disease severity, this research suggests that clinicians should be cautious in relying solely on this parameter, as severe thrombocytopenia can occur without typical warning signs.

Benefits and Recommendations

The findings of this study highlight the need for a multifaceted approach to dengue diagnosis and management. Incorporating regular monitoring of hematocrit levels alongside platelet counts may help clinicians better predict disease severity, even in the absence of typical clinical signs. Further research with larger sample sizes is recommended to validate these findings and refine diagnostic protocols for atypical dengue presentations. Public health strategies should also focus on improved vector control and education to mitigate the rising dengue burden in urban Bangladesh.

Conflict of Interests

The authors have no competing interests that are relevant to the content of this article to declare.

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Statements and Declarations

All authors had access to the data and a role in writing the manuscript, with no disclaimers and patient consent was obtained.

Financial Disclosure

No funding was not involved in the manuscript writing, editing, approval or decision to publish.

Data Availability

Data Availability Statement: All data generated or analyzed in this study are included in this article. Access to data is possible with permission from the responsible author.

Consent for Publication

Informed consent was obtained from the patient for publication of this case report and is stated in the manuscript.

Authors Contribution

All authors contributed equally to this paper.

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