

Symptomatology and Hemodynamic Trends in Dengue Fever: An Observational Study

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Abstract:

Background: Dengue is a mosquito-borne viral infection posing significant public health challenges, particularly in tropical and subtropical regions. It presents with a range of clinical symptoms, from mild fever to severe complications, and early diagnosis and monitoring are crucial to reduce morbidity and mortality.

Objectives: This study aimed to analyze the clinical presentation and hematological parameters of patients diagnosed with dengue fever admitted to a tertiary care hospital over a one-year period.

Methods: A total of 105 patients diagnosed with dengue fever were included in this observational study conducted from April 2024 to March 2025. Clinical symptoms, pulse rate, and platelet counts were recorded and analyzed. Data collection was performed at a tertiary care hospital with standardized diagnostic criteria.

Results: Fever was the most common symptom, reported in 100 patients, followed by vomiting (43), headache (18), and abdominal pain (14), with fewer cases of body ache, malaise, joint pain, rashes, and diarrhoea. Most patients (63) had a pulse rate between 61–100 bpm, while 25 had rates between 41–60 bpm, 14 had rates over 100 bpm, and 3 were below 40 bpm. Platelet counts were notably reduced in many cases, with 36 patients showing levels below 50,000/ μ L and 39 between 50,000–100,000/ μ L.

Discussion: The findings show that fever and vomiting are common in dengue, with many patients experiencing thrombocytopenia. Monitoring platelet counts and pulse rate is vital for effective management and preventing complications.

Keywords: Dengue, Clinical symptoms, Platelet count, Fever.

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Introduction

Dengue fever is an acute viral infection caused by the dengue virus, a mosquito-borne flavivirus that has emerged as a significant public health challenge in tropical and subtropical regions globally. The disease is transmitted primarily by the *Aedes aegypti* mosquito and manifests in a wide clinical spectrum, ranging from mild febrile illness to severe dengue hemorrhagic fever and dengue shock syndrome [1].

Globally, dengue has shown a dramatic increase in incidence over the past few decades, with nearly half of the world's population now at risk.

The World Health Organization (WHO) estimates that there are approximately 390 million dengue infections per year, of which 96 million manifests clinically [2].

India, being a tropical country, faces a high burden of dengue cases annually, particularly during the monsoon and post-monsoon seasons, when the

mosquito vector proliferates. The disease presents a significant economic and healthcare burden due to hospitalizations and resource-intensive management [3].

In clinical settings, dengue diagnosis is primarily based on characteristic clinical features supported by laboratory findings, including leukopenia, thrombocytopenia, and elevated hematocrit [4].

Hematological parameters are pivotal in determining disease severity and prognosis, particularly platelet counts, which are closely monitored during the illness [5].

This study aims to assess the clinical presentation and hematological profile of dengue patients admitted to a tertiary care hospital, with a focus on understanding symptom distribution, platelet trends, and pulse rate abnormalities. The findings are expected to contribute to better clinical management

and risk stratification in dengue-affected individuals.

Material and Methods

The study was conducted at a tertiary care hospital affiliated with the research institution, spanning from April 2024 to March 2025. A total of 105 patients diagnosed with dengue were selected for the study. The inclusion criteria consisted of patients presenting with a history of fever along with symptoms such as vomiting, joint pain, diarrhoea, abdominal pain, and headache. All selected patients were confirmed positive for dengue infection through IgM antibody or NS1 antigen testing.

The exclusion criteria for the study included all patients who tested negative for dengue IgM or NS1 antigen. Additionally, patients who exhibited normal vital signs and clinical parameters were excluded from the study. This included those with normal heart rate, blood pressure, body temperature, breath sounds, and respiratory rate, as these individuals did not show clinical signs suggestive of active dengue infection.

Dengue diagnosis in this study was primarily based on detecting the NS1 antigen and antibodies (IgM and IgG). For patients who showed symptoms indicative of dengue within the first five days of illness, the NS1 antigen test was performed, as it is most effective during the early phase of infection. In cases where patients sought medical attention after five days of symptom onset, antibody tests for IgM and IgG were conducted, since these antibodies become more detectable later in the course of the disease.

Data Collection

Clinical symptoms were recorded at the time of patient presentation through direct interviews and examination. The symptoms documented included fever, vomiting, malaise, body ache, headache, abdominal pain, joint pain, rashes, and diarrhea. Each symptom was noted as present or absent, and the total number of cases exhibiting each symptom was tabulated.

Pulse rate was measured for each patient using a digital or manual pulse monitoring device upon admission. The readings were classified into four categories for analysis: less than 40 beats per minute (bpm), 41 to 60 bpm, 61 to 100 bpm, and greater than 100 bpm. This categorization helped assess the variation in cardiovascular response among febrile patients.

Platelet count was evaluated by collecting peripheral blood samples from patients using standard aseptic techniques. The samples were processed using an automated hematology analyzer to determine platelet levels. The results were grouped into four categories: below 50,000/ μ L, between 50,000 and

100,000/ μ L, between 100,000 and 150,000/ μ L, and above 150,000/ μ L. These groupings aided in identifying the extent of thrombocytopenia in the study population.

Results

This study analyzed 105 clinically confirmed cases of dengue fever over a one-year period from April 2024 to March 2025 at a tertiary care hospital. The clinical profile revealed a wide spectrum of symptoms. Fever was universally present, reported in almost 95% of the patients, reaffirming it as the most consistent and hallmark symptom of dengue infection. Vomiting emerged as the second most common symptom, affecting 41% of the cases, and likely reflecting gastrointestinal involvement. Headache was reported in 17.1% of the cases, a symptom often associated with the classic febrile phase of dengue. Abdominal pain and body ache were noted in 13.3% and 11.4% of patients, respectively, suggesting visceral discomfort and musculoskeletal involvement. Malaise, indicative of general unease and fatigue, was reported by 10.5% of the patients. Joint pain, often linked to the term “breakbone fever,” was observed in 7.6% of the cases. Dermatological manifestations such as rashes were relatively rare, appearing in only 2.9% of patients, and diarrhoea was the least reported symptom at 1%, indicating that gastrointestinal symptoms other than vomiting were uncommon in this cohort. (Table 1)

In terms of cardiovascular assessment, pulse rate distribution varied significantly among patients. A majority (60%) had pulse rates within the normal range of 61 to 100 beats per minute. Interestingly, 23.8% of patients exhibited bradycardia, with pulse rates between 41 to 60 bpm, which can be attributed to the effect of dengue on cardiac autonomic function or dehydration-related changes. A smaller group (13.3%) showed tachycardia, with pulse rates exceeding 100 bpm, potentially reflecting high-grade fever, hypovolemia, or early signs of dengue shock. Only a few patients (2.9%) had pulse rates below 40 bpm, a condition that warrants close monitoring due to its possible association with severe disease or myocarditis. (Table 2)

The hematological findings highlighted a high prevalence of thrombocytopenia, a well-documented complication of dengue. Platelet counts were severely reduced ($<50,000/\mu$ L) in 34.3% of the cases, placing these patients at a higher risk of bleeding manifestations and requiring careful clinical monitoring. An additional 37.1% of patients had moderate thrombocytopenia, with counts between 50,000 to 100,000/ μ L. These findings underscore that over 70% of the study population experienced some degree of platelet depletion. Meanwhile, 14.3% had platelet counts between 100,000 to 150,000/ μ L, and another 14.3%

maintained counts above 150,000/ μ L, suggesting that not all patients with dengue experience severe hematological changes. (Table 3) Overall, the results highlight the variability in clinical and laboratory presentations of dengue. While fever was universal, other manifestations varied widely in

frequency and severity. The significant proportion of patients with thrombocytopenia and abnormal pulse rates underscores the need for vigilant monitoring and individualized supportive care during dengue outbreaks.

Table 1: Distribution of clinical symptoms among Dengue Patients

Symptoms	Number of Cases
Fever	100
Vomiting	43
Malaise	11
Body ache	12
Headache	18
Abdominal Pain	14
Joint pain	08
Rashes	03
Diarrhoea	01

Table 2: Pulse Rate Distribution in Dengue Patients

Pulse Rate (bpm)	Number of Cases
<40	03
41-60	25
61-100	63
>100	14

Table 3: Distribution of Platelet Counts among Dengue Patients

Platelet Count (Cells/ mm^3)	Number of Cases
<50000	36
50000-100000	39
100000-150000	15
>150000	15

Discussion

This study provides a comprehensive clinical and hematological profile of dengue patients admitted to a tertiary care hospital over a one-year period. The findings align with the classical presentation of dengue fever, with all patients experiencing fever, supporting its role as a cardinal symptom. However, the presence and variability of other symptoms such as vomiting, headache, and abdominal pain highlight the diverse symptomatology associated with dengue virus infection. The relatively lower incidence of rashes and diarrhoea may reflect geographical or seasonal variations, or differences in the serotype of dengue virus circulating during the study period.

Gastrointestinal symptoms were prominent, particularly vomiting, which affected 41% of patients. This aligns with findings in other regional studies that describe dengue as a systemic illness often involving the gastrointestinal tract. The presence of body ache, malaise, and joint pain further emphasizes the systemic nature of the disease and its impact on the musculoskeletal system. The lower frequency of rashes compared to classical dengue descriptions suggests that

cutaneous manifestations may not be a reliable indicator in all cases and may vary with disease severity or phase of illness [6].

The pulse rate distribution revealed noteworthy findings. While most patients had pulse rates in the normal range (61–100 bpm), nearly one-quarter experienced bradycardia. This phenomenon has been previously documented and is thought to be a result of dengue-related autonomic dysfunction or transient myocarditis [7]. The presence of tachycardia in a smaller subset of patients could be related to fever, dehydration, or early hypovolemic states associated with plasma leakage, a hallmark of severe dengue [8]. The identification of such cardiovascular changes supports the need for close monitoring of vital signs, especially during the critical phase of illness [9].

Hematologically, thrombocytopenia was a prominent feature, consistent with dengue pathophysiology, where bone marrow suppression and peripheral destruction of platelets contribute to low platelet counts [10]. Over 70% of the study population had platelet counts below 100,000/ μ L, reinforcing the importance of regular monitoring to prevent complications such as spontaneous bleeding

[11]. The 34.3% of patients with severe thrombocytopenia ($<50,000/\mu\text{L}$) highlight the potential need for platelet transfusion or hospitalization in resource-limited settings [12]. However, it is worth noting that platelet count alone may not correlate directly with bleeding risk, and clinical judgment should guide management [13]. The study's strength lies in its real-world clinical data collected over a year-long period, capturing seasonal variations and diverse presentations. However, limitations include the single-center nature of the study and the absence of virological or serotype confirmation, which may influence the symptomatology and severity of illness [14].

Conclusion

This study underscores the broad clinical spectrum and hematological impact of dengue fever. While fever remains the most consistent feature, symptoms such as vomiting, headache, and abdominal pain are common and warrant clinical attention. The significant occurrence of bradycardia and thrombocytopenia further emphasizes the importance of close monitoring of cardiovascular and hematological parameters in dengue patients. These findings support the implementation of standardized protocols for early diagnosis, risk stratification, and supportive care, particularly in endemic regions during outbreak seasons. Further multicentric and serotype-specific studies are needed to enhance understanding and improve management strategies for dengue fever.

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