



CLINICAL MANIFESTATIONS OF DENGUE FEVER IN PEDIATRIC PATIENTS AND THEIR ASSOCIATION WITH COAGULATION PARAMETERS AND PLATELET COUNT: AN ORIGINAL STUDY

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ABSTRACT

Background: Dengue fever is a major mosquito-borne viral illness in children with a wide clinical spectrum ranging from mild febrile illness to severe dengue hemorrhagic fever and dengue shock syndrome. Early identification of severe disease using clinical and laboratory parameters such as platelet count and coagulation profile is essential to reduce morbidity and mortality.

Methodology: This hospital-based observational study was conducted in the Department of paediatrics Sree Mookambika Institute of Medical Sciences, Kulasekaram, from May 2025 to February 2026. Children aged 0–18 years with confirmed dengue infection (NS1 antigen/IgM/IgG positive) were included. Detailed clinical history, examination findings, complete blood count, and coagulation profile were recorded. Data were analyzed using SPSS version 17.0, and statistical significance was assessed using Chi-square test, Fisher's exact test, unpaired t-test, and Mann–Whitney U test.

Results: A total of 50 pediatric patients were studied. Most cases were observed in children >10 years (36%) with male predominance (56%). Fever was the most common symptom (98%), followed by nausea (62%) and headache (42%). Thrombocytopenia was present in 66% of patients, while leukocyte abnormalities were seen in 88%. PT and INR derangements were observed in 8% and 6% of cases respectively.

Conclusion: Dengue in children presents with varied clinical manifestations, with thrombocytopenia showing a strong association with disease severity. Early monitoring of platelet count and coagulation profile is essential for timely identification of severe dengue and improved outcomes.

Keywords: Dengue Fever, Children, Thrombocytopenia, Coagulation Profile, Dengue Hemorrhagic Fever, Platelet Count.

INTRODUCTION

Dengue fever is a mosquito-borne viral illness caused by the dengue virus (DENV), transmitted primarily by *Aedes aegypti*, a day-biting mosquito that feeds on humans predominantly during daylight hours, thereby facilitating rapid urban transmission cycles. The global burden of dengue has increased dramatically over recent decades, with significant morbidity affecting children in tropical and subtropical regions, particularly in South Asia. The clinical manifestations of dengue vary widely depending on host immunity, viral serotype, and age, ranging from asymptomatic infection to severe and life-threatening disease forms.

Clinically, dengue infection presents as a broad spectrum of illness, including (1) inapparent infection, (2) nonspecific febrile illness, (3) classic dengue fever, (4) dengue hemorrhagic fever (DHF), (5) dengue shock syndrome (DSS), and in rare cases, (6) neurological manifestations such as encephalopathy and fulminant hepatic failure [1]. Classic dengue fever is typically characterized by abrupt onset high-grade fever, retro-orbital pain, severe myalgia, arthralgia, headache, and maculopapular rash. However, disease progression in a subset of patients can lead to severe plasma leakage, coagulopathy, and hemorrhagic manifestations.

Guzman et al. reported that the majority of dengue cases present as uncomplicated dengue fever, while a smaller proportion progresses to severe forms such as DHF and DSS [2]. These severe manifestations are primarily driven by increased vascular permeability, leading to plasma leakage, hemoconcentration, hypotension, and ultimately



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hypovolemic shock. DSS is associated with significant mortality, with case fatality rates reaching up to 5% even in healthcare settings [3].

Early recognition of patients at risk of severe dengue is crucial for reducing mortality, which can be reduced to less than 1% with timely supportive management [3]. Clinical warning signs such as petechiae, persistent vomiting, mucosal bleeding, abdominal pain, lethargy, and hepatomegaly, along with laboratory abnormalities including thrombocytopenia (platelet count $\leq 100,000$ cells/mm³), elevated hematocrit, and prolonged coagulation parameters, are valuable in predicting disease severity [4]. Among these, thrombocytopenia and coagulation profile abnormalities have been widely studied as potential early indicators of progression to severe dengue.

Treated DHF/DSS has a mortality rate of approximately 3%, whereas untreated cases may have mortality rates as high as 20% [3,4]. This highlights the importance of early identification and prompt intervention in suspected severe cases. Despite advances in supportive care, no specific antiviral therapy is currently available, and dengue vaccines remain limited in availability and use in many endemic regions.

Therefore, identifying reliable biomarkers that can predict progression from uncomplicated dengue to severe disease remains a clinical priority. Hematological parameters, particularly platelet count and coagulation profile abnormalities, may serve as useful prognostic indicators for early stratification of disease severity in pediatric patients. This study aims to evaluate the clinical spectrum of dengue in children and assess its correlation with coagulation parameters and platelet count to aid early prediction of severe disease and improve clinical outcomes.

Aim and Objectives

Aim

To study the clinical spectrum of dengue fever in children and evaluate the correlation between disease severity, platelet count, and coagulation profile.

Objectives

1. To describe the various clinical manifestations of dengue infection in the pediatric population.
2. To assess hematological parameters, particularly platelet count, in children with dengue fever.

3. To evaluate coagulation profile abnormalities in pediatric dengue cases.

METHODOLOGY

The present study was conducted in the Department of Paediatrics, Sree Mookambika Institute of Medical Sciences, Kulasekharam, during the study period from May 2025 to February 2026. Children aged between 0 and 18 years with a confirmed diagnosis of dengue fever were included in the study. Confirmation of dengue infection was based on positive laboratory tests including NS1 antigen, IgM dengue, or IgG dengue depending on the duration of illness at presentation. Patients who tested negative for dengue serology and those presenting with fever of more than two weeks duration were excluded from the study.

All eligible patients were admitted and managed as inpatients. A detailed clinical history was obtained from each patient, followed by a comprehensive physical examination. Vital parameters including temperature, pulse rate, respiratory rate, and blood pressure were recorded at the time of admission and monitored regularly until discharge. Laboratory evaluation included complete blood count and dengue serological testing (NS1 antigen/IgM/IgG), while additional investigations were performed as per individual clinical indications.

All collected data were entered into a pre-designed structured study proforma. The data were analyzed using appropriate statistical methods. Qualitative variables were expressed in terms of frequency and percentage, and associations between categorical variables were assessed using the Chi-square test. Fisher's exact test was applied when expected cell counts were small in 2x2 contingency tables. Quantitative variables were summarized as mean \pm standard deviation (SD) or median with interquartile range (IQR) based on data distribution. Normality of data was assessed prior to analysis, and comparisons between groups were performed using the unpaired Student's t-test for normally distributed variables, while the Mann-Whitney U test was used for non-normally distributed variables. A p-value of less than 0.05 was considered statistically significant. Statistical analysis was performed using SPSS version 17.0, and graphical representations were prepared using Microsoft Excel 2010.

RESULT

Table no 1: Age and sex distribution of dengue cases

Demographic characters	Subgroups	Frequency	Percent %
Age group	Less than 1 year	3	6
	1 to 5 years	12	24
	6 to 10 years	17	34

	more than 10 years	18	36
Sex	Male	28	56
	Female	22	44

Table no 2: Clinical Presentation of Dengue

Clinical Features	Frequency	Percent
Fever	49	98
Retro orbital pain	17	34
Headache	21	42
Sore throat	4	8
Petechiae	6	12
Rash	8	16
Anorexia	8	16
Arthralgia	8	16
Hematemesis	2	4
Melaena	1	2
Itching/purities	17	34
Difficulty in breathing	4	8
Vomiting	6	12
Abdominal distension	8	16
Peri orbital puffiness	8	15
Anasarca	6	12
Altered sensorium	4	8
Decreased urine output	7	14
Nausea	31	62
Hepatomegaly	4	8

Table no 3: General Examination

General examination	Frequency	Percent %
High grade fever	24	48
Low grade fever	26	52
Pallor	4	8
Tachycardia	18	36

Table No 4: TLC deranged

TLC deranged	Frequency	Percent %
Yes	44	88
No	6	12
Total	50	100

Table no 5: Platelet count (lakhs/cu.mm)

Platelet count (lakhs/cu.mm)	Frequency	Percent %
< 1.5 lakh	33	66
> 1.5 lakh	17	34
Total	50	100

Table no 6: Coagulation Profile (PT/ INR, PTT)

PT Deranged	Frequency	Percent %
No	46	92
Yes	4	8
Total	50	100

Table no.7: INR

INR deranged	Frequency	Percent %
No	47	94

Yes	3	6
Total	50	100

DISCUSSION

In the present study, dengue infection was observed predominantly in the older pediatric age group, with the highest proportion (36%) seen in children aged more than 10 years, followed by 6–10 years (34%) and 1–5 years (24%). This age distribution is comparable to findings reported in several tropical studies where school-aged children and adolescents are more frequently affected due to increased outdoor exposure and greater vector contact. A slight male predominance was noted (56%), which may be attributed to higher exposure of male children to mosquito breeding environments, consistent with observations in similar epidemiological studies [5].

Fever was the most consistent clinical presentation, observed in 98% of cases, reaffirming its role as the cardinal symptom of dengue infection. Other common manifestations included nausea (62%), headache (42%), retro-orbital pain (34%), and vomiting (12%), which are classical features of dengue viral illness as described in WHO guidelines [6]. Hemorrhagic manifestations such as petechiae (12%), hematemesis (4%), and melena (2%) were less frequent but clinically significant, indicating progression towards severe disease in a subset of patients. These findings are consistent with the clinical spectrum described by Simmons et al., who emphasized that while most dengue cases remain uncomplicated, a proportion may progress to hemorrhagic manifestations and plasma leakage syndromes [7].

General examination findings revealed low-grade fever in 52% and high-grade fever in 48%, indicating variability in clinical severity at presentation. Tachycardia was observed in 36% of patients, which may be associated with fever, dehydration, or early circulatory compromise. Pallor was noted in 8% of cases, possibly reflecting associated anemia or plasma leakage.

Hematological analysis showed leukocyte abnormalities in 88% of patients, indicating significant bone marrow suppression, a well-documented feature of dengue infection. Thrombocytopenia was prominent, with 66% of patients having platelet counts below 1.5 lakh/cu.mm. This finding strongly supports the known pathophysiology of dengue-induced bone marrow suppression and peripheral platelet destruction. Similar correlations between thrombocytopenia and disease severity have been reported in multiple studies, highlighting platelet count as an important prognostic marker [8].

Coagulation profile abnormalities were relatively less frequent in this study, with PT derangement observed in 8% and INR abnormalities in 6% of cases. However, even mild coagulation disturbances in dengue infection may reflect early coagulopathy and endothelial dysfunction. WHO has emphasized that coagulation abnormalities, when associated with thrombocytopenia, increase the risk of progression to dengue hemorrhagic fever and dengue shock syndrome [6].

Overall, the findings of this study highlight that while most pediatric dengue cases present with uncomplicated febrile illness, a subset demonstrates hematological and coagulation abnormalities that may indicate risk of severe disease. Early identification of thrombocytopenia and coagulation derangements is essential for timely intervention and prevention of complications. Close monitoring of platelet trends and coagulation parameters, along with clinical assessment, remains crucial in managing pediatric dengue patients effectively.

CONCLUSION

The present study highlights that dengue fever in children predominantly affects the older pediatric age group with a slight male preponderance. Fever remains the most consistent clinical presentation, while symptoms such as headache, retro-orbital pain, nausea, and vomiting are commonly associated. Although most cases present as uncomplicated dengue illness, a subset of patients demonstrate hemorrhagic manifestations and warning signs suggestive of disease progression.

Hematological abnormalities, particularly leukocyte derangement and thrombocytopenia, were frequently observed, indicating significant bone marrow suppression and peripheral platelet destruction. A majority of patients had reduced platelet counts, emphasizing its importance as a key laboratory marker in dengue infection. Coagulation profile abnormalities, though less common, were present in a small proportion of patients and may indicate early coagulopathy in severe disease.

Overall, the study demonstrates a significant association between clinical severity of dengue and hematological parameters, especially platelet count. Early recognition of thrombocytopenia and monitoring of coagulation parameters can aid in predicting disease progression and improving clinical outcomes in pediatric dengue patients. Prompt diagnosis, close monitoring, and supportive management remain the cornerstone in reducing morbidity and preventing complications associated with severe dengue.

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