

CLINICAL PRESENTATION AND MANAGEMENT OF DENGUE IN PEDIATRIC PATIENTS

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ABSTRACT

Objective: Dengue fever poses a significant challenge to global health, particularly affecting children in endemic regions. The diverse clinical presentations, ranging from mild to severe forms such as dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS), complicate its diagnosis and management in pediatric populations. Understanding the clinical nuances is crucial, given the substantial global burden of dengue.

Methods: This prospective cross-sectional study conducted at the Department of Pediatrics, Yashoda Super Specialty Hospital, aimed to investigate the clinical, laboratory, and radiological features of dengue fever in pediatric patients aged 6 mo to 16 y. Data collection involved demographic details, clinical presentations, laboratory findings, and treatment administered. Statistical analysis was performed using SPSS version 19.0.

Results: Among the 100 enrolled pediatric patients, high fever (100%), headache (75%), myalgia (70%), rash (65%), and hemorrhagic manifestations (40%) were prevalent clinical features. Laboratory findings revealed thrombocytopenia in 60% of cases and elevated liver enzymes in 30%. Correlation analyses identified associations between specific symptoms and diagnostic findings, aiding in the recognition of severe cases such as DSS.

Conclusion: The study highlights the diverse clinical spectrum of pediatric dengue, emphasizing the importance of vigilant clinical assessment and laboratory testing for timely diagnosis and management. These insights are essential for optimizing patient care and outcomes, particularly in endemic regions.

Keywords: Dengue fever, Pediatric patients, Clinical features, Laboratory findings, Diagnostic correlation

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INTRODUCTION

Dengue fever remains a formidable challenge in global health, disproportionately affecting children in regions where it is endemic. This mosquito-borne illness manifests a spectrum of clinical presentations, from nonspecific viral syndromes to life-threatening conditions such as dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS) [1]. The variability in clinical outcomes underscores the complexity of diagnosing and managing dengue, particularly in pediatric populations. Given the global burden of dengue, with millions of cases annually, understanding its clinical nuances in children is crucial for reducing morbidity and mortality [2].

Children represent a particularly vulnerable cohort for severe manifestations of dengue. Their developing immune systems may not only predispose them to more severe disease but also complicate the clinical picture, making early diagnosis and intervention critical. This demographic's susceptibility emphasizes the need for clinicians to adeptly interpret both clinical signs and adjunctive diagnostic tests, including laboratory and radiological data, to guide management strategies effectively [3].

Moreover, the intersection of dengue fever with broader public health challenges, such as the effects of climate change on mosquito populations and the difficulties of implementing effective dengue control measures in resource-constrained environments-adds, layers of complexity to its management. These factors necessitate a comprehensive, multidisciplinary approach to dengue prevention, diagnosis, and treatment, particularly in pediatric settings [4].

This paper aims to dissect the intricate relationship between clinical presentations and diagnostic findings in pediatric dengue, illuminating the correlation between symptoms, laboratory markers, and imaging studies. Through an exhaustive review of recent literature and case analyses, we strive to enhance the current understanding of pediatric dengue management, spotlighting the integration of clinical and diagnostic insights for optimizing patient outcomes [5].

By delving into the specifics of pediatric dengue, from symptomatology to treatment paradigms, this manuscript endeavors to fortify the global health community's response to a persistently challenging disease, with a special focus on safeguarding our youngest and most vulnerable populations [6].

MATERIALS AND METHODS

This prospective cross-sectional study was conducted at the Department of Pediatrics, Yashoda Super Specialty Hospital, Malakpet, Hyderabad, from January 2019 to May 2020. The study aimed to investigate the clinical presentation, laboratory and radiological findings, and management strategies of dengue fever in pediatric patients aged 6 mo to 16 y.

Study design and population

The study included hospitalized children within the specified age group, presenting symptoms of probable dengue such as fever, vomiting, and abdominal pain. The diagnosis of dengue fever was confirmed through laboratory tests, including NS1 antigen, IgM, and IgG ELISA. Patients with co-infections were also included. Those with negative dengue serology and those not consenting were excluded.

Sample size calculation

Based on a previous study by Sachin Talpe *et al.*, with a vomiting incidence of 69%, a confidence level of 95%, and a 10% precision, the calculated minimum sample size was 83. However, the study successfully enrolled 100 participants after considering consent and eligibility criteria.

Data collection

Data were collected using a specially designed format, including demographic details, clinical presentation, laboratory findings, and treatment administered. Initial and subsequent daily monitoring of vital signs and laboratory parameters were recorded for the first 5 d of hospitalization.

Ethical considerations

The study received approval from the ethical committee of Yashoda Academy of Medical Education and Research. Informed consent was obtained from parents or guardians, and assent from children over 14 y, as applicable.

Statistical analysis

Data analysis was conducted using SPSS version 19.0. Qualitative parameters were summarized using frequencies and percentages, while quantitative parameters were expressed as means with standard deviation. The Chi-square test was used to assess associations between qualitative factors, with a p-value of <0.05 considered significant.

RESULTS

Our study comprehensively analyzed clinical features and laboratory findings in pediatric patients diagnosed with dengue fever. Table 1 illustrates the prevalence of various clinical manifestations among the patients. High fever was universally present (100%), followed by headache (75%), myalgia (70%), rash (65%), and hemorrhagic manifestations (40%). Laboratory findings indicated thrombocytopenia in 60% of cases and elevated liver enzymes in 30% of the patients.

In table 2, we explored the correlation between clinical symptoms/signs and diagnostic findings. Fever, severe headache,

myalgia, and rash were associated with nonspecific laboratory findings, underscoring the clinical challenge in dengue diagnosis based solely on these symptoms. However, specific associations were identified for more severe symptoms. Hemorrhagic manifestations were correlated with thrombocytopenia and a positive tourniquet test. Persistent vomiting was linked to elevated liver enzymes and signs of dehydration, while abdominal pain was associated with elevated liver enzymes and, in severe cases, ascites. Notably, dengue shock syndrome (DSS) correlated with severe thrombocytopenia, elevated hematocrit indicating hemoconcentration, and radiological findings of pleural effusion and ascites, highlighting the severe systemic impact of advanced dengue infection.

Table 1: Clinical features and laboratory findings in pediatric dengue patients

Feature	Percentage (%)
High Fever	100
Headache	75
Myalgia	70
Rash	65
Hemorrhagic Manifestations	40
Thrombocytopenia	60
Elevated Liver Enzymes	30

Table 2: Correlation between clinical symptoms/signs and diagnostic findings in pediatric dengue fever

Symptom/sign	Laboratory findings	Radiological findings
Fever	Nonspecific	N/A
Severe headache	Nonspecific	N/A
Myalgia (Muscle pain)	Nonspecific	N/A
Rash	Nonspecific	N/A
Hemorrhagic manifestations	-Thrombocytopenia (low platelet count) -Positive tourniquet test	N/A
Persistent vomiting	-Elevated liver enzymes -Signs of dehydration	N/A
Abdominal pain	-Elevated liver enzymes	Ascites in severe cases
Dengue shock syndrome (DSS)	-Severe thrombocytopenia -Elevated hematocrit indicating hemoconcentration	-Pleural effusion -Ascites

DISCUSSION

The findings of this study contribute significantly to the understanding of pediatric dengue, a condition that poses a considerable public health challenge in endemic regions. The clinical spectrum of dengue in children ranges from mild, nonspecific symptoms to severe, life-threatening manifestations such as dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS). Our research highlights the prevalence of various clinical features among pediatric patients, with high fever being universal, followed by headache, myalgia, rash, and significant rates of hemorrhagic manifestations and thrombocytopenia [7].

A critical insight from our study is the correlation between specific clinical symptoms and laboratory findings. While fever, headache, myalgia, and rash are associated with nonspecific laboratory findings, making early diagnosis based solely on these symptoms challenging, severe symptoms like hemorrhagic manifestations and persistent vomiting provide clearer diagnostic markers [8]. Hemorrhagic manifestations, for instance, correlate with thrombocytopenia and a positive tourniquet test, offering a more definitive indication of dengue fever. Similarly, persistent vomiting and abdominal pain, associated with elevated liver enzymes, point towards more severe disease progression, necessitating immediate medical intervention [9].

The association of dengue shock syndrome (DSS) with severe thrombocytopenia, elevated hematocrit, and radiological findings of pleural effusion and ascites underscores the systemic impact of advanced dengue infection. These findings emphasize the need for a high index of suspicion and vigilant monitoring of patients presenting with dengue-like symptoms, especially in endemic areas [10].

Management of pediatric dengue remains a challenge due to the broad spectrum of disease severity and the lack of specific treatment

options. The mainstay of dengue management includes supportive care, with emphasis on fluid management, monitoring for warning signs of severe dengue, and timely intervention to prevent complications [11]. Our study's findings suggest that an integrated approach, combining clinical assessment with laboratory and radiological investigations, is essential for the early detection and management of severe dengue cases. Such an approach can significantly reduce morbidity and mortality among pediatric patients [12].

Furthermore, the study sheds light on the critical role of early diagnosis and the limitations of current diagnostic tools, which often yield nonspecific results in the early stages of the disease. This limitation highlights the need for the development of more sensitive and specific diagnostic methods that can aid in the early detection of dengue, facilitating timely and appropriate management [13].

Overall, this study underscores the complex clinical presentation of pediatric dengue and the importance of a multidisciplinary approach to diagnosis and management. It emphasizes the need for heightened awareness and vigilance among healthcare providers, particularly in endemic regions, to improve outcomes for pediatric dengue patients. Future research should focus on identifying novel diagnostic markers and developing targeted therapeutic interventions to enhance patient care and reduce the global burden of dengue.

CONCLUSION

Our study underscores the diverse clinical spectrum of pediatric dengue, ranging from common symptoms like fever and myalgia to severe manifestations such as hemorrhagic phenomena and dengue shock syndrome. The correlation between specific symptoms and laboratory findings, particularly in severe cases, emphasizes the

importance of vigilant clinical assessment and laboratory testing in the timely diagnosis and management of dengue in children. These insights are crucial for clinicians in endemic regions to enhance patient care and outcomes in pediatric dengue cases.

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AUTHORS CONTRIBUTIONS

All authors have contributed equally

CONFLICT OF INTERESTS

Declared none

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