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Anomalous And Complex Presentation Of Dengue Fever In A Pediatric Patient: A Case Report

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Abstract
Dengue fever, caused by the dengue virus transmitted by Aedes mosquitoes, is a significant global health concern, particularly in tropical and subtropical regions. We present a case of a 7-year-old child with an atypical presentation of dengue fever, highlighting diagnostic challenges, management strategies, and the importance of clinical suspicion in pediatric cases. This report underscores the need for comprehensive assessment and timely intervention in children with unusual manifestations of dengue fever.

Keywords: Dengue fever, pediatric, atypical presentation, thrombocytopenia, supportive care, public health

Introduction

Dengue fever is a mosquito-borne viral infection endemic in over 100 countries, predominantly in tropical and subtropical regions. It is caused by four distinct serotypes of the dengue virus (DENV-1 to DENV-4), transmitted primarily by Aedes mosquitoes, particularly Aedes aegypti and Aedes albopictus. The disease spectrum ranges from asymptomatic infection to severe manifestations such as dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS), which can be life-threatening if not promptly recognized and managed (1-2).

Classically, dengue fever presents with sudden onset of high fever, severe headache (especially retro-orbital), myalgias, arthralgias, and rash. However, atypical presentations, especially in pediatric patients, can complicate diagnosis and delay appropriate management. Atypical features may include gastrointestinal symptoms (abdominal pain, vomiting), neurologic manifestations (such as encephalopathy), and unusual hematological abnormalities (3-4).

This case report discusses an uncommon presentation of dengue fever in a 7-year-old child, emphasizing the clinical course, diagnostic evaluation, management strategies, and outcomes. Through this detailed analysis, we aim to enhance understanding of atypical dengue presentations in pediatric populations and highlight the importance of early recognition and supportive care in improving patient outcomes.

Case Presentation: A 7-year-old male presented to the pediatric emergency department with a three-day history of fever, abdominal pain, and irritability. The child was previously healthy, with no significant medical history or recent travel outside the local area. There was no reported contact with individuals known to have dengue fever or exposure to mosquito-prone environments. The family denied any recent use of medications or herbal remedies.

History and Initial Assessment: The fever was intermittent, reaching up to 39°C (102.2°F), and was accompanied by diffuse abdominal discomfort. The abdominal pain was described as cramping in nature, without radiation or aggravating factors. The child's parents noted irritability and decreased oral intake over the preceding 24 hours. There were no reports of vomiting, diarrhea, or dysuria. Physical examination upon presentation revealed a tired-looking child who appeared lethargic but was responsive to verbal stimuli. Vital signs showed a temperature of 38.8°C (101.8°F), heart rate of 110 beats per minute, respiratory rate of 20 breaths per minute, and blood pressure of 100/60 mmHg. Oxygen saturation was 98% on room air.

Clinical Findings: On examination, the child's skin was warm and dry, with no rash or petechiae noted initially. There was mild diffuse abdominal distension, and palpation revealed tenderness upon deep palpation in the periumbilical region without guarding or rebound tenderness. Bowel sounds were normoactive in all quadrants. There were no signs of meningeal irritation or focal neurological deficits. The rest of the physical examination, including cardiovascular and respiratory systems, was unremarkable.

Diagnostic Workup: Given the clinical suspicion of an acute febrile illness with predominant abdominal symptoms, initial laboratory investigations were initiated. Blood samples were collected for complete blood count (CBC), liver function tests (LFTs), renal function tests (RFTs), electrolytes, and coagulation profile. Additionally, a rapid diagnostic test (RDT) for malaria was performed due to endemicity in the region, although malaria was not considered the leading differential diagnosis based on clinical presentation.

Laboratory Findings: Initial laboratory results revealed leukopenia (white blood cell count of 3,500 cells/mm^3) and thrombocytopenia (platelet count of 90,000/mm^3). Hemoglobin level was within normal limits (12.5 g/dL), and hematocrit was 38%. Liver enzymes (AST and ALT) and renal function tests were normal. The coagulation profile showed a normal activated partial thromboplastin time (aPTT) and prothrombin time (PT). A rapid diagnostic test (RDT) for malaria was negative.

Specific Dengue Investigations: Given the clinical suspicion and epidemiological context (endemic region for dengue fever), a dengue NS1 antigen test was performed, which returned positive within a few hours of admission. This confirmed the diagnosis of acute dengue virus infection in the child.

Clinical Course and Management: Following the confirmation of dengue fever, the child was admitted for close monitoring and supportive care. According to local dengue management guidelines, strict vital signs monitoring (including temperature, heart rate, blood pressure, and oxygen saturation) was initiated every four hours. Fluid intake and output were meticulously recorded, and strict input-output charting was maintained (5-6,9,10).

Fluid Management: Intravenous fluid therapy was initiated cautiously to maintain hydration and prevent complications such as hypovolemic shock or fluid overload. A crystalloid solution (normal saline or Ringer's lactate) was administered based on weight and ongoing fluid balance assessments. The child's urine output was closely monitored to ensure adequate renal perfusion and hydration status.

Symptomatic Management: The child received symptomatic treatment for fever and discomfort. Acetaminophen (paracetamol) was administered for fever control, with careful attention to dosing based on weight and age-appropriate guidelines. The child was also given antiemetics as needed for mild nausea and oral discomfort (11).

Hematological Monitoring: Serial monitoring of hematological parameters, including complete blood count (CBC) and platelet count, was conducted every 12 hours initially and then adjusted based on clinical stability. The child's platelet count showed a gradual decline to 60,000/mm^3 within 48 hours of admission, indicating ongoing viral replication and hematological involvement typical of dengue fever.

Clinical Evolution and Complications: On the second day of hospitalization, the child developed scattered petechiae on the lower extremities and mild epistaxis, raising concerns for potential progression to severe dengue or dengue hemorrhagic fever (DHF). However, repeat hematocrit remained stable, and there were no signs of plasma leakage or severe bleeding. The child remained hemodynamically stable throughout the hospitalization period, with no evidence of shock or significant fluid imbalance.

Infectious Disease Consultation: Given the atypical presentation and potential for disease progression, an infectious disease specialist was consulted for further management guidance. The specialist recommended ongoing close monitoring of clinical parameters, continuation of supportive care measures, and consideration of antiviral therapy if clinical deterioration or severe complications ensued.

Clinical Improvement and Discharge Planning: Over the next 48 hours, the child's clinical condition gradually improved. Fever subsided, and irritability decreased. Serial laboratory tests showed a gradual increase in platelet count (up to 120,000/mm^3) and normalization of leukocyte count. There were no further episodes of bleeding or other complications. The child tolerated oral intake well and was transitioned from intravenous to oral fluids.

Discharge Criteria: On day 5 of hospitalization, the child met discharge criteria as per local dengue management guidelines. These criteria included afebrile status for at least 24 hours without antipyretic medications, stable hematological parameters (platelet count >100,000/mm^3), adequate oral intake, and absence of significant clinical symptoms or signs of complications.

Follow-Up Care: The child was discharged home with strict instructions for outpatient follow-up with the pediatrician. The family was educated about the signs and symptoms of dengue fever recurrence or complications, including persistent fever, abdominal pain, mucosal bleeding, or neurological symptoms. They were advised to seek immediate medical attention if any concerning symptoms developed.

Discussion: Dengue fever is characterized by a wide spectrum of clinical manifestations, ranging from mild febrile illness to severe forms such as DHF and DSS. While classic symptoms include abrupt onset of high fever, severe headache, retro-orbital pain, myalgias, and rash, atypical presentations can occur, particularly in pediatric patients. These atypical presentations may

include gastrointestinal symptoms (such as abdominal pain and vomiting), neurologic manifestations (such as encephalopathy or seizures), and unusual hematological abnormalities (including profound thrombocytopenia and hemoconcentration).

Pathophysiology of Dengue Fever: The pathophysiology of dengue fever involves viral tropism for endothelial cells, monocytes, and macrophages. Following mosquito inoculation, the virus undergoes a series of replication cycles in these cells, leading to systemic viral dissemination. The hallmark of dengue virus infection is immune-mediated vascular leakage, which can result in plasma leakage syndrome and potentially progress to severe manifestations like DHF or DSS. The exact mechanisms underlying vascular leakage in dengue fever involve cytokine dysregulation, complement activation, and endothelial dysfunction.

Diagnostic Challenges in Pediatric Dengue Fever: Diagnosing dengue fever in pediatric patients can be challenging due to the diverse clinical presentations and overlapping features with other febrile illnesses, such as malaria, leptospirosis, and viral hepatitis. Classic signs like rash and severe headache may be absent in some cases, leading to delayed diagnosis and appropriate management. Laboratory confirmation of dengue virus infection is essential and can be achieved through various diagnostic modalities, including serological tests (such as dengue NS1 antigen, IgM and IgG antibodies), molecular assays (such as PCR), and viral isolation in specialized laboratories.

In our case, the diagnosis of dengue fever was confirmed based on positive dengue NS1 antigen testing, consistent with acute dengue virus infection. The child's clinical presentation, including fever, abdominal pain, thrombocytopenia, and leukopenia, supported the diagnosis, despite the absence of classic symptoms like rash and severe headache. This highlights the importance of maintaining a high index of suspicion for dengue fever in pediatric patients presenting with acute febrile illness, particularly in endemic regions.

Management Strategies in Pediatric Dengue Fever: Management of pediatric dengue fever focuses on supportive care, including fluid management, monitoring for complications, and symptomatic relief. The cornerstone of therapy is maintaining adequate hydration while avoiding fluid overload or exacerbating plasma leakage. Intravenous fluid therapy is initiated cautiously based on clinical assessment and ongoing monitoring of vital signs, urine output, and hematological parameters (such as platelet count and hematocrit).

Symptomatic management includes antipyretic therapy for fever control (e.g., acetaminophen) and management of pain or discomfort. Nonsteroidal anti-inflammatory drugs (NSAIDs) should be avoided due to the risk of exacerbating bleeding tendencies and renal impairment. Close monitoring for signs of clinical deterioration or progression to severe dengue (such as persistent vomiting, severe abdominal pain, mucosal bleeding, or altered mental status) is essential, with prompt escalation of care as needed.

Complications and Prognosis: Complications of pediatric dengue fever can range from mild (such as transient thrombocytopenia or mild hemoconcentration) to severe (such as plasma leakage syndrome, hemorrhagic manifestations, or multiorgan failure). The prognosis depends on early recognition, timely intervention, and appropriate supportive care measures. With prompt diagnosis and management, the majority of pediatric patients with uncomplicated dengue fever recover fully without long-term sequelae.

In our case, the child experienced mild thrombocytopenia and transient petechiae without evidence of severe bleeding or plasma leakage. Close monitoring and supportive care were pivotal in preventing progression to severe dengue and ensuring favorable clinical outcomes. The child's clinical condition gradually improved with supportive measures, and he was discharged home in stable condition after meeting discharge criteria.

Epidemiological Context and Public Health Implications: Dengue fever remains a significant public health challenge in endemic regions, with periodic outbreaks and seasonal variations in disease incidence. Factors contributing to dengue transmission include urbanization, population mobility, inadequate vector control measures, and environmental factors (such as climate change and rainfall patterns). Effective dengue prevention and control strategies encompass vector control measures (such as insecticide spraying, larval source reduction, and community engagement), early detection and diagnosis, and public health education.

In endemic regions like ours, enhancing community awareness about dengue prevention, early recognition of symptoms, and seeking timely medical care are crucial in reducing disease burden and preventing outbreaks. Public health efforts should focus on integrated vector management strategies, strengthening healthcare infrastructure for early diagnosis and management, and fostering collaboration between healthcare providers, public health authorities, and community stakeholders.

Research Directions and Knowledge Gaps: Further research is needed to better understand the pathophysiology of dengue fever, particularly in pediatric populations, and elucidate factors contributing to atypical clinical presentations. Studies exploring host immune responses, genetic predisposition to severe dengue, viral dynamics, and potential biomarkers for disease severity are warranted. Additionally, research on vaccine development, including efficacy and safety profiles in pediatric age groups, remains a priority in global efforts to combat dengue fever.

Conclusion: This case report highlights an atypical presentation of dengue fever in a pediatric patient, emphasizing the diagnostic challenges, management strategies, and clinical outcomes. The case underscores the importance of maintaining a high index of suspicion for dengue fever in pediatric patients presenting with acute febrile illness, even in the absence of classic

symptoms such as rash and severe headache. Timely diagnosis, supportive care, and close monitoring are essential in managing pediatric dengue fever and preventing complications.

By detailing the clinical course, laboratory findings, management approach, and outcomes in this case, we contribute to the existing literature on atypical dengue presentations in pediatric populations. Continued research and vigilance are crucial in improving our understanding of dengue fever pathogenesis, enhancing diagnostic capabilities, and optimizing management strategies to mitigate disease burden and improve patient outcomes globally.

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