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BMH Med. J. 2023;10(1):4-8. **Research Article**

Clinical Profile Of Dengue Fever in Children During an Outbreak in Rural Parts of Kozhikode in 2018-2019

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Abstract

Objective: To study the clinical profile and outcome of dengue fever in children at a tertiary care hospital during an outbreak in Kozhikode.

Methods: A prospective observational study was conducted with a sample size of 120 children. The diagnosis of dengue fever was confirmed as per the standards, the data was analyzed, and summarized by descriptive statistics.

Results: Severe dengue was seen in 8.5% cases. The mean age was 7.5 years and the male to female ratio was 1.2:1. The most common clinical manifestations were fever (99.5%), rash (57%), vomiting (52.5%), and bicytopenia (60%). None of the participants in the study died.

Conclusion: Identifying and treating patients at high risk of severe dengue requires a clinical assessment and close monitoring, especially in Indian settings with limited resources. It is also necessary to focus on anti-vector measures during rainy seasons and public awareness.

Keywords: Dengue, Rural, Platelet counts, Complications, No deaths

Introduction

The dengue virus, which is transmitted by mosquitoes, is rapidly spreading throughout the globe. Typical mosquito species that transmit the Dengue virus are Aedes aegypti and Aedes albopictus. Dengue is a serious disease that causes a range of complications and may even lead to death [1].

The first severe outbreaks of dengue in the Philippines and Thailand occurred in the 1950s. Across Asia and Latin America, severe dengue is now as common as malaria, causing hospitalizations and deaths among children and adults [2].

A person infected with this disease can experience symptoms ranging from subclinical disease (not even realizing they are infected) to severe flu-like symptoms. Some people are particularly susceptible to severe dengue, which has the potential to cause severe bleeding, organ impairment, and/or plasma leakage. The bleeding and capillary permeability of capillaries in people who were previously infected with one subspecies of the dengue virus become more pronounced if they are exposed to another subspecies. This is referred to as dengue hemorrhagic fever [1,3].

Over the last two decades, WHO has reported over a million dengue cases, up from a mere 505,430 cases in 2000, to more than 2.4 million cases in 2010 and 5.2 million cases in 2019. Modeling estimates suggest 390 million dengue virus infections annually, of which 96 million become clinically evident. Another study on the prevalence of dengue estimates that 3.9 billion people are at risk of infection with dengue viruses. Although infection risks exist in 129 countries, 70% of the threat originates from Asia [2].

Materials and Methods

A prospective observational study was carried out during 2018-2019. All children who had a high-grade fever, headache, retro-orbital pain, extreme tiredness, abdominal pain, vomiting, and bleeding manifestations were initially admitted. Children with positive dengue test NS1 Ag, IgM, IgG antibody, and rapid serological test kit for ELISA were recruited into the study group. The whole number of patients during the outbreak was 200, but the children included in the study were 120 (who were admitted and were on follow-up under one Unit to maintain uniformity of data). These patients were constantly observed for worsening clinical symptoms or signs with hematological correlation. Other investigations like ultrasonogram, liver function tests, and other appropriate ones were carried out depending on clinical status. The patients were treated with oral paracetamol, IV fluids, blood products, and inotropes as per the recent WHO dengue guidelines [4]. The frequency of various signs and symptoms and the laboratory tests were compared, and the results were correlated. The outcomes were recorded.

Results

Of the total number of children admitted, there were 66 males (55%) and 54 females (45%). There were a total of 41 cases (34.1%) in the age group of 10 to 15 years. The mean age of hospitalized patients was 7.5 years. Of the 120 children, 5 (4.1%) were infants. Most cases were admitted during the monsoon season and the months following it - between June and August. Among the 97 children, 88.8% were from Kozhikode district, 18 (15%) from Malappuram, three (2.5%) from Kannur district, and 2 were from other parts of Kerala (1.6%).

Symptomatic presentation of the patient population has been presented in **Figure 1**.

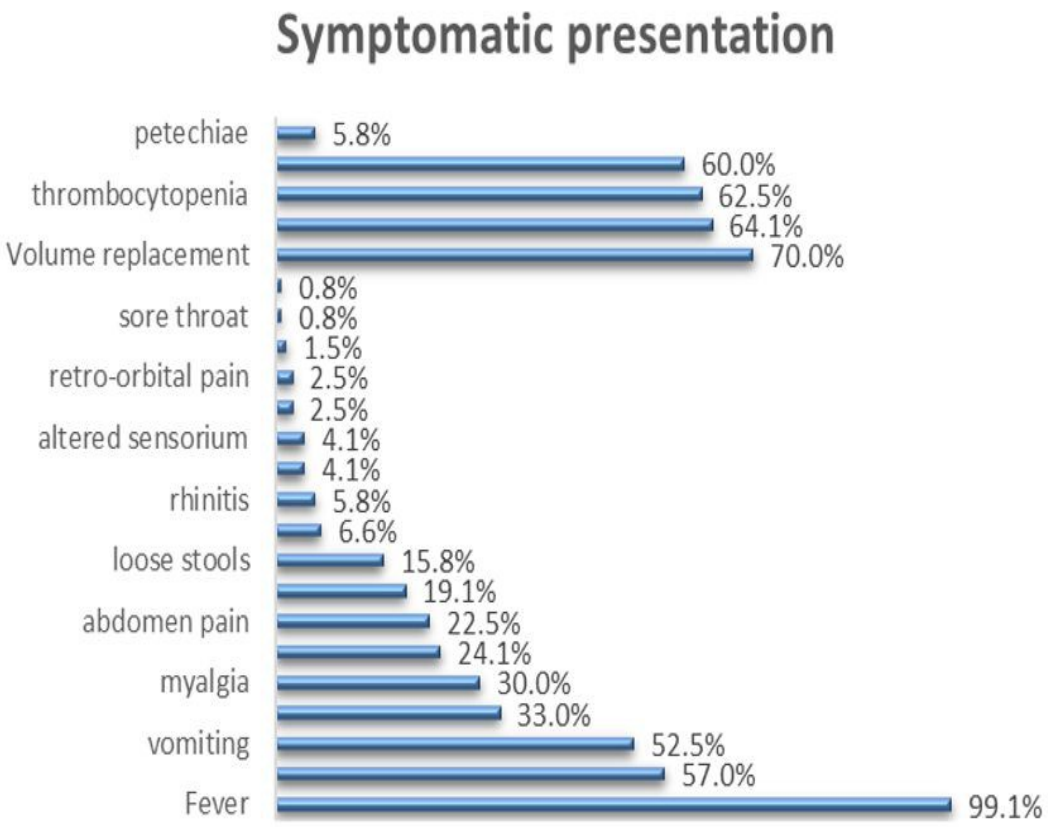

Figure 1: Clinical manifestation of the trial population

Other common symptoms including lethargy, poor feeding, poor activity, giddiness, pedal edema, facial puffiness, periorbital edema, petechiae, subconjunctival bleed, nausea, constipation, conjunctival congestion, abdominal distension, hemoptysis, peripheral cyanosis, hematuria, and epistaxis were less common.

Of all 120 children, 20 children (16.6%) developed hypotension, 15 children (12.5%) responded to fluid resuscitation whereas 5 children (4.1%) required ionotropic support.

Platelet count started improving on day 8 of illness in 37 children (31%). The mean day of illness in which platelet count was raised was 8.39 days. Only one child required platelet transfusion.

Dengue NS1 was positive in 114 children (95%) and Dengue IgM positive in 20 children (16.6%). 14 children (11.6%) had both Dengue NS1 and IgM positivity. One child (0.8%) was Dengue IgG positive as well (refer **Table 1**).

Table 1: Dengue Serology and the percentage of cases

Dengue Serology	Freq N=120	Percentage
Dengue NS1 Ag positive	114	95.0
IgM Dengue positive	20	16.6
Dengue NS1 and IgM positive	14	11.6
IgG positive	1	0.8

These 120 children were classified according to the case definition based on the National Guidelines for Clinical Management of Dengue fever published in the year 2015. Among all, 20 children (17%) had mild dengue fever, 90 children (75%) had moderate dengue fever and 10 (8%) had severe dengue fever.

Complications as shown in **Table 2** were present in 14 (11.6%) children in this study, they include Cardiac arrhythmias in 10 children (8.3%) and ARDS in 2. Children (1.6%), myositis in 1 child (0.8%) and glomerulonephritis in one child (0.8%). None of the children expired in the study.

Table 2: Table showing complications in children with Dengue infection

Complications	Number of patients with complications (14)	Percent (11.6%)
Myositis	1	0.8
Glomerulonephritis	1	0.8
Cardiac Arrhythmias	10	8.3
ARDS	2	1.6

Discussion

In the study, there was crowding of cases in the rainy and post-monsoon period. Of 120 children, 97 (81%) children were from Kozhikode district. No similar studies were done from here previously. There was no significant difference between boys and girls in this study which was similar to studies done by George T et.al. [5], and Singh AA et al. [6].

In the present study, the diagnosis was mainly clinical with corroborative evidence of hematological, serological, and radiological parameters. The major clinical symptoms were fever, rash, vomiting, headache, myalgia, pruritus, abdomen pain, cough, loose stools, melaena, rhinitis, seizures, altered sensorium, gum bleeding, retro-orbital pain, hematemesis, sore throat, arthralgia and syncope which was similar to a study done by Ramabhatta S et.al [7].

In these children, the incidence of gastrointestinal bleeding in the form of melaena and haematemesis was 8%. But Shubhankar et al [8] have reported a much higher incidence of 76.9%. The most common bleeding manifestation was petechiae, as seen in a study done by de Souza [9] et al. None of the patients had serious bleeding manifestations even when the platelet count was below 20, 000. In a study done by Shubhankar et.al [8], there was found to be no significant correlation between platelet count and bleeding manifestations. The mean day of illness in which platelet count rose was 8.39 days which was comparable with the data from National guidelines [4].

Out of 120 children, 14 children (11.6%) developed complications, out of which the most common was cardiac arrhythmias in 10 children (8.3%), followed by ARDS in 2 children (1.6%), peripheral cyanosis and myositis in 1 child each (0.8%) and glomerulonephritis in one child (0.8%). In a study done by Srinivas et.al [10], ARDS was the most common complication followed by pleural effusion.

By the end of the study, it was found that 100% of patients recovered completely and there was no death from the disease.

Conclusion

The present study highlights the importance of dengue fever to clinicians in the areas of

epidemiology, manifestations, complications, and outcome of the disease. Early detection and access to proper medical care can lower the fatality rates to below 1%. Revised WHO criteria help in categorizing patients and management effectively. It is more important to diagnose patients at risk for severe dengue illness and closely monitor them to avoid complications and death, especially in India, where health care resources are scarce. The importance of effective anti-vector measures should also be placed on public awareness, particularly during the rainy season.

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