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ORIGINAL ARTICLE

Dengue Fever in Children: A Clinical and Laboratory Review with an Analysis of Treatment Results

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ABSTRACT

Objective: This study evaluated dengue fever in paediatric patients by looking at their clinical and laboratory characteristics as well as their treatment outcomes.

Methods: In this study 110 pediatric cases of dengue fever were included. The presence of dengue-specific IgM seroconversion and the detection of the non-structural protein NS1 were used to confirm laboratory-positive dengue cases. All data was analysed using SPSS 22.0.

Results: Among all, 70 (63.6%) cases were males and 40 (36.4%) cases were females. Mean age of the children was 8.5 years. One of the most prevalent initial signs was a high temperature. The most prevalent clinical signs were pleural effusion and hepatomegaly. The most prevalent finding on ultrasonography was gall bladder oedema. As per laboratory findings, thrombocytopenia and leucopenia was the most common. The use of colloids and crystalloids in their administration facilitated management.

Conclusion: In children, DF can show up in a variety of ways in the lab and in the clinic. To lessen the suffering and death caused by dengue in children, it is essential to treat the key phases appropriately according to clinical and laboratory findings.

Keywords: Severe dengue, Thrombocytopenia, Transaminases

INTRODUCTION

Dengue fever is the most frequent viral disease spread by mosquitoes.Each of the five dengue serotypes has the potential to cause the disease. This species calls the tropics and subtropics home, including tropical Asia, the Americas (both north and south), the Caribbean, and more than a hundred more countries. Approximately 96 million people get dengue fever symptoms each year, out of more than 390 million who get the virus.[1,2] The annual number of dengue fever cases reported to the World Health Organisation has been on the rise over the past fifty years, as the disease has expanded to new countries. The rapid global spread of dengue has made it an increasing economic and public health burden.

Dengue fever symptoms range from completely absent to life-threatening shock or bleeding.It is thought that both the virus and the host contribute to the symptoms experienced by infected individuals with dengue. A rash, headache, retro-orbital pain, bone pain, myalgia, arthralgia, petechiae, and petechiae are characteristic symptoms of dengue fever, which usually lasts for 2-7 days.The following symptoms were also noted: abdominal pain, nausea, vomiting, or diarrhoea[4]. Most infected people will experience symptoms. Conversely, most kids either don't exhibit any symptoms at all or exhibit quite moderate ones. Because a diagnosis is not easily made before the distinctive symptoms develop, it is necessary to screen persons with relevant laboratory markers and a travel history or who live in endemic places for dengue. Additionally, dengue fever is a dynamic disease. Having a good understanding of the dynamic characteristics of dengue may help clinicians with diagnosis and treatment. The incubation period for dengue fever is typically five to seven days after infection; however, in extremely rare cases, severe dengue fever can develop.A clear fever that does not exceed one week in duration, along with no indications of upper respiratory illness and at least two of the following symptoms—headache, pain behind the eyes, general discomfort, muscle or joint pain—must be present. Additionally, there must be gastrointestinal symptoms such as diarrhoea, vomiting, skin rash, or petechiae. A positive tourniquet test, low white blood cell count or platelet count, or high liver enzymes must also be present[7] Adults and children experience symptoms in different ways.

Adults with dengue fever often have myalgia, retro-orbital pain, nausea, and arthralgia, while infants with the disease tend to experience rashes and vomiting, according to previous research[8] Dengue fever affects people of all ages differently; adults often experience haemorrhage, whereas children often develop vascular leakage. Infants in Bangladesh had a high temperature and gastrointestinal problems, while those in Thailand exhibited symptoms of fatigue and hepatomegaly[9] The differences between adult and paediatric symptoms, however, remain unclear. Reducing the number of days that Latin American children miss school, the number of days they are hospitalised, and the number of deaths that could occur as a result of the dengue pandemic requires targeted health efforts[9].

Dengue is the leading cause of death among children globally, even when considering other viral infections transmitted by vectors[7]. Over the last several decades, dengue disease has become more common in India. Malaria and dengue fever were the leading causes of fever among hospitalised patients with acute undifferentiated fever[8]. Climate change, fluctuations in temperature and precipitation[4], obesity and undernourishment[9,10], and the unfortunate population's ignorance and lack of prevention measures for dengue fever[11,12] are all factors that contribute to this predicament.

Many patients experienced symptoms such as haemorrhage, shock, myalgia, arthralgia, fever, and headache. This study aims to examine the analytical and clinical features of dengue fever in children.

MATERIALS AND METHODS

This Retrospective observational study was conducted at Pediatric department Saidu medical college/Saidu group of teaching hospital during April 2022 to March 2023. All patients receiving medical treatment in the paediatric section who were younger than 15 years old were included. Children with a history of blood problems were not eligible.

Each patient's basic demographic information was collected, including their name, age, sex, and residence. Fever, myalgia, headache, nausea, vomiting, diarrhoea, petechiae, bleeding symptoms, rash, and other symptoms were noted during the patient's history and physical examination. Pallor, organomegaly, urine output, signs of fluid retention, and circulatory failure were also noted in the patient's vitals and test results. Blood tests such as haemoglobin, total lymphocyte count, hemocrit, platelet count, and serum albumin, glutamic oxalic acid, and glutamic pyruvic

transaminase (SGPT) were performed on the patient. Possible radiological studies included a chest X-ray and an ultrasound of the belly. Also recorded are details about any alternate diagnoses or co-infections that were considered at the time of admission or release.

All data was analysed using SPSS 22.0.

RESULTS

Among all, 70 (63.6%) cases were males and 40 (36.4%) cases were females. Mean age of the children was 8.5 years. One of the most prevalent initial signs was a high temperature. The most prevalent clinical signs were pleural effusion and hepatomegaly. The most prevalent finding on ultrasonography was gall bladder oedema. (table 1)

Table-1: Demographics of the presented cases

Variables	Frequency (110)	Percentage
Gender		
Male	70	63.6
Female	40	36.4
Mean age (years)	8.5	
Symptoms		
Fever	43	39.1
Vomiting	30	27.3
Rash	18	16.4
Headache	10	13.6
Abdominal Pain	6	5.5
Petechiae	3	2.7
Signs		
Pleural Effusion	77	70
Hepatomegaly	33	30
GB Edema	25	22.7

As per laboratory findings, thrombocytopenia and leucopenia was the most common. Ns1 Antigen Positivity was found in 55 (50%) cases, frequency of serology (l) IgM positive was 27 (24.5%). (table 2)

Table-2: Laboratory results among all cases

Variables	Frequency	Percentage
Lab Results		
thrombocytopenia	61	55.5
leucopenia	35	31.8
Anaemia	14	12.7
Ns1 Antigen Positivity	55	50
serology (l) IgM positive	27	24.5

Among all, 104 cases were recovered, 5 cases were left against medical advice and mortality was found in only 1 patient. (table 1)

Table-1: Outcomes of all cases

Variables	Frequency	Percentage
Outcomes		
Recovered	104	94.5
left against medical advice	5	4.5
Mortality	1	0.9

DISCUSSION

The prevalence and severity of illness were both higher in this study group's male participants. The same male majority reported in past experiments may be explained by the existence of a more exposed location, which raises the high likelihood of mosquito-borne diseases[13]. The bulk of the children were between the ages of 6 and 12, which is in line with earlier studies[14].

Fever was one of the main signs. Anorexia and vomiting were also common symptoms among our patients. Along with arthralgia and stomach pain, headache was another well-known complaint. This symptom has been described in a number of investigations[15]. The number of patients whose tourniquet tests came back positive was quite low. Because the people who took part in this study tended to have darker skin tones, the results are in line with those of earlier studies conducted in India[16]. The frequency was higher among children with critical illnesses, nevertheless. Additionally, flushing was more common among really unwell children. These traits can be used for early detection of these children. During their recovery, more than a third of the youngsters who took part in our study complained itching. Another difference was that some of them got an erythematous rash instead of the more typical rash seen in the first stages of the disease. Unlike blanchable rashes, this one mixed in with healthy skin patches, creating what some have called "white islands in a sea of red"[17,18].

Petechiae accounted for 10% of all cases of bleeding, making it the most common type. Mishra et al.[19] also discovered the same thing in their study. Approximately one-third of the children enrolled in our study reported experiencing coughing and runny nose as prodromal symptoms. These symptoms were not addressed in any of the previous studies. There may have been some differences between this study and others because it was conducted during a dengue outbreak, when medical personnel were very wary of the disease and went to great lengths to screen for it. Similar illnesses during the non-epidemic season that were marked by a runny nose and cough would have been regarded as non-specific viral illnesses. In line with previous assessments, hepatomegaly was observed in 57% of the children included in this study. However, two of the children had hepato splenomegaly. Both of them were found to have malaria. Consequently, in our setting, splenomegaly in dengue-infected children necessitates evaluation for co-infections with other vector-borne diseases[21]. Along with those who had malaria, two other patients developed fevers that persisted for more than a week. It is crucial to check for co-infections in children with a persistent fever. These children had gram-negative bacterial sepsis, which made their dengue infection worse.

Out of all the primary laboratory parameters, thrombocytopenia was the most frequently observed abnormality. Most of them had mild to moderate thrombocytopenia, whereas a small number had normal platelet counts. Less than three quarters of the children had leucopenia[22,23]. Among the children surveyed, 40% had at least one high SGOT level (>120 IU/L). The severity of transaminitis was reported to increase with increasing SGOT levels, according to previous studies[24]. Hyponatraemia and low albumin levels are common in severely ill children and should be considered when assessing their risk of serious illness.

CONCLUSION

In children, DF can show up in a variety of ways in the lab and in the clinic. To lessen the suffering and death caused by dengue in children, it is essential to treat the key phases appropriately according to clinical and laboratory findings.

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