

Original Research Article

Clinical profile of dengue fever in children presented at a tertiary care hospital

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ABSTRACT

Background: Dengue fever is a benign syndrome caused by an arthropod-borne virus and is characterized by Biphasic fever, myalgia, and arthralgia, rash, leucopenia, and lymphadenopathy. Dengue hemorrhagic fever and dengue shock syndrome are a severe, often fatal febrile disease caused by 1 of 4 dengue virus. It is characterized by increased capillary permeability, abnormalities of hemostasis and protein-losing shock syndrome. The aim of this study was to assess the clinical profile, complications and outcome of dengue infection in children.

Methods: All children attending the hospital with symptoms and signs suggestive of dengue fever were tested for NS1 antigen and IgM/ IgG dengue antibody serology (depending on the day of fever) by enzyme-linked immunosorbent assay (ELISA) technique.

Results: Of the 174-dengue serology positive children, fever was the most common major symptom (97.7%) followed by vomiting (85.6%), loss of appetite (81.6%), abdominal pain (77%), body pain/leg pain (62.6%). Severe dengue as per WHO criteria was seen in 29 (16.7%) children. Thrombocytopenia (platelet count less 1,00,000) was observed in 82 children (47%), Platelet count less than 20,000 in 8 children (4.5%). Dengue shock syndrome was seen in 26 children (15%). Mortality was nil.

Conclusions: In children, if symptoms like fever, vomiting, loss of appetite, abdominal pain and body pain are present, a strong possibility of dengue fever is present especially in an epidemic setting. Early suspicion and effective management can reduce the severity.

Keywords: Bleeding tendencies, Dengue haemorrhagic fever, Dengue shock syndrome, Increased capillary permeability, Thrombocytopenia

INTRODUCTION

Dengue fever is a systemic and dynamic disease caused by single-stranded RNA-virus of the genus flavivirus and transmitted to human through the bite of infected *Aedes* mosquito, principally *Aedes aegypti*.¹ While most patients recover following a self-limiting non-severe clinical course, small proportion progress to severe disease, mostly characterized by plasma leakage with or without hemorrhage. Intravenous rehydration is the

therapy of choice. This intervention can reduce the case fatality to less than 1% of severe cases.² In Tamil Nadu, there was a steady decline in the number of dengue cases from 2012 to 2016 along with a decrease in the mortality.³ The year 2017 witnessed a bigger outbreak of dengue fever in Tamil Nadu with more than 20,000 cases reported and 65 deaths.⁴ The WHO estimates that presently about two fifths of the world population is at risk for this viral infection.¹ Dengue fever was first reported by Benjamin Rush et al, in 1780 as “break bone

fever.” It is a mosquito borne viral infection with four serotypes causing dengue without warning signs, and dengue with warning signs and severe dengue.² It is estimated that worldwide nearly 2.5 billion people continue to live at risk of contracting the infection while 50 million cases and 24,000 deaths tend to occur in 100 endemic countries and reported to be around 1 million annually from tropical and subtropical countries. The aim of the study was to assess the clinical profile, complications and outcome of dengue infection in children.

METHODS

The study was conducted at Department of Pediatrics, Government medical college and hospital, Pudukkottai. A prospective descriptive study was conducted for a period of 3 months from October 2017 to December 2017.

Inclusion criteria

- All the probable cases suspected with clinical signs and symptoms of dengue fever were admitted in the pediatric ward were included.

Exclusion criteria

- Patients age more than 18 years were excluded.

Patients were examined for various clinical signs like pallor, icterus, cyanosis, lymphadenopathy, edema feet, edema face, and signs of dehydration like weak and thready pulse, sunken eyes etc., conjunctival congestion, and detailed examination of pharynx, toxic look, and presence of rashes over the body.

All children attending the hospital with symptoms and signs suggestive of dengue fever were tested for NS1 antigen and IgM/ IgG dengue antibody serology (depending on the day of fever) by enzyme-linked immunosorbent assay ELISA technique.

All dengue serology positive children were admitted in a 40 bedded Pediatrics fever ward and were enrolled in a structured protocol which included symptoms, signs, diagnosis, complication, relevant investigations, treatment, duration of stay and outcome. The diagnosis of dengue fever was based on the WHO criteria.⁵ Prior approval from the hospital ethics committee was obtained. All this data was recorded and entered in the predesigned, pre-tested, and semi structured questionnaire.

RESULTS

During the study period of 3 months, 174 dengue serology positive children were admitted, among which 93 were male children (53.5%), and 81 were female children (46.5%).

The age of the children ranged from 11 months to 12 years, with a mean age of 86 months (7 years four months).

Table 1: Common presenting symptoms.

| Symptom | No. of children | % |
|------------------------------|-----------------|------|
| Fever | 170 | 97.7 |
| Vomiting | 149 | 85.6 |
| Loss of appetite | 142 | 81.6 |
| Abdominal pain | 134 | 77 |
| Body pain/ leg pain | 109 | 62.6 |
| Headache/ retro orbital pain | 92 | 52 |
| Abdominal distension | 62 | 35.6 |
| Skin rash | 55 | 31.6 |
| Bleeding tendencies | 36 | 20.7 |
| Convulsion | 5 | 2.9 |

Based on the symptoms, fever was the most common symptom observed is 170 out of the 174 children (97.7%) (Table 1). The remaining four children were afebrile on admission but had a history of fever 2-5 days before admission. The time interval between the onset of fever and the day of admission varied from less than 24 hours to 8 days. The mean duration of fever on admission was three days in present study.

The other common complaints were vomiting 84.6% (149/174), decreased appetite 81.6% (142/174), abdominal pain 77% (134/174), body pain and leg pain 62.6% (109/179). Other less common symptoms included a headache and retro-orbital pain in 52.9%, abdominal distension in 35.6%, skin rash (Both transient macular, generalized rash that blanches on pressure and/or generalized morbilliform macula popular rash) was observed in 31.6%.⁵

Bleeding tendencies which included petechiae, purpura, epistaxis, and Malena were present in 35.6%. Five children (2.9%) presented with convulsion on admission but none were dengue encephalitis/ encephalopathy.² children developed bradycardia during the clinical course, but echocardiogram was normal.

Table 2: WHO classification.

| Classification of fever | No. of children | Percentage |
|-------------------------|-----------------|------------|
| Undifferentiated fever | 67 | 38.5 |
| Dengue fever | 78 | 44.8 |
| Severe dengue | 29 | 16.7 |

Out of the total 174 children, 145 children were cases of non-severe dengue (undifferentiated fever, dengue fever with or without warning signs). Twenty-nine children were severe dengue, of which 26 children had dengue circulatory shock, and 3 had major severe bleeding (Table 2).

Table 3: Thrombocytopenia.

| Minimum platelet count | No. of children | % |
|------------------------|-----------------|------|
| 1,00,000-50,000 | 51 | 29.3 |
| 50,000-20,000 | 23 | 13 |
| Less than 20,000 | 8 | 4.5 |
| Total | 82 | 47 |

Thrombocytopenia (Platelet count less than 1,00,000) was observed in 82 children (47%). In most of the children, thrombocytopenia was observed between 3rd day and 8th day of fever. However rarely (in 2 children) platelet count fall was observed even before 48 hours after onset of fever. In 4 children thrombocytopenia persisted for more than 15 days. During serial follow up of platelet count, the minimum platelet count was between 50,000-1,00,000 in 51 children (29.3%), between 20,000-50,000 in 23 children (13.2%) and less than 20,000 in 8 children (4.5%) (Table 3).

Dengue shock syndrome was considered if the pulse Pressure (difference between the systolic and diastolic pressure) was ≤ 20 mm of Hg and had signs of poor capillary perfusion (cold extremities, delayed capillary refill and rapid pulse rate). The circulatory shock was present in 26 out of 174 dengue serology positive children (15%). Three children received a whole blood transfusion for shock management, and the rest of the children were managed with crystalloid intravenous fluids. There was nil death in present study.

DISCUSSION

Dengue is the most rapidly spreading mosquito-borne viral disease in the world. In the last 50 years, incidence has increased 30-fold with increasing geographic expansion to new countries and in the present decade from urban to a rural setting.²

Dengue virus infection is often inapparent but can lead to a wide range of clinical manifestations, from mild fever to plasma leakage and the potentially fatal dengue shock syndrome.^{6,7} The clinical manifestations of dengue in infants differ, with a greater frequency of plasma leakage and shock compared with dengue in older children. Dengue disease was originally classified by the WHO into dengue fever, dengue hemorrhagic fever and dengue shock syndrome. However, as dengue spread worldwide, it became evident that this classification was not universally applicable for clinical management.^{8,9}

In our study, there were 174 children with dengue serology positivity. Among the age and sex ratio, the majority of children were in the older age group more than six years and male to female ratio of 1.2:1. A similar pattern was seen in most studies and may be due to the increasing outdoor activity of older children and male children making them more prone to the Aedes mosquito bite.

Among the symptoms, fever was the most commonly observed in 97.7% of children. Tamilselvam et al. In a similar study have quoted fever as the most common symptoms in more the 90%.¹⁰ The other common symptoms were vomiting 85.6%, loss of appetite 81.6%, abdominal pain 77% and body pain/leg pain 62.6%.

Based on the WHO TDR 2009 Dengue guidelines, out of the total 174 children, 67 (38.5%) were undifferentiated fever, and 78 (44.8%) were Dengue fever with and without warning signs. Severe dengue was present in 29 (16.7%) children. Shubhankar Mishra et al, reported a similar percentage of 31.9% and 54.6% of undifferentiated fever and dengue fever (with and without warning sign). Severe dengue was diagnosed in 13.4% in the above study.¹¹

Thrombocytopenia (platelet count less than 1,00,000) was observed in 82 children (47%) in our study. Shubhankar Mishra et al, study reported 27.85% with thrombocytopenia where as Deshwal R et al.⁷ Study reported 69.51% with thrombocytopenia.¹² Present study value was in between the two other studies.

Dengue shock syndrome was observed in 26 (15%) children who were in concordance with Tamilselvan et al. study which reported 18.6% with shock.^{10,6}

CONCLUSION

Dengue fever is a self-limiting viral infection with a small proportion going in for severe disease. Symptoms like fever, vomiting, loss of appetite, abdominal pain, body pain/leg pain, and rash should prompt a clinician on the possibility of dengue infection. Early diagnosis, careful monitoring, and proper fluid management go a long way in reducing the mortality due to dengue hemorrhagic fever and shock syndrome.

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