CLINICAL PROFILE OF DENGUE FEVER IN CHILDREN- A STUDY FROM CALICUT, KERALA
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ABSTRACT

BACKGROUND
Dengue is a major health concern prevalent mainly in tropical and sub-tropical countries. Over the last decade, Kerala has seen several epidemics of this disease. The present study is to document the clinical profile of children who suffered from this potentially fatal illness.

MATERIALS AND METHODS
The study was undertaken as a hospital-based descriptive study with prospective data collection. The aim was to assess the clinical features of children with confirmed dengue fever who were admitted to a tertiary care hospital during a 6-month period from July to December 2015.

RESULTS
Forty three children who were suspected to have dengue fever and had seropositivity were included. Majority were males, (52%). The most common presentation was fever (100%), with 33% presenting with fever of more than 6 days duration. This was followed by nausea and vomiting (67%), abdominal pain (43%), malaise (40%), headache (33%), myalgia (26%), and loose stools (23%). Haemorrhagic manifestations were rare (7%). 33% had dengue fever, 48% had dengue fever with warning signs and 19% had severe dengue. Complications seen were seizure, ascites, pleural effusion and myocarditis. There were no deaths reported.

CONCLUSION
Early diagnosis and treatment are the keys to management while community measures need to be addressed in order to stop the spread of dengue fever and reduce the increasing burden of health care due to dengue in Kerala.

KEYWORDS
Dengue Fever, Bleeding, Thrombocytopenia.

HOW TO CITE THIS ARTICLE: Chakkalackal JJ, Akkarakaran VJ. Clinical profile of dengue fever in children- A study from Calicut, Kerala. J. Evid. Based Med. Healthc. 2017; 4(16), 947-950. DOI: 10.18410/jebmh/2017/184

BACKGROUND
Dengue fever is caused by the dengue virus (DEN), a small single-stranded RNA virus comprising four distinct serotypes (DEN-1 to -4) belonging to the genus FlaviVirus. The virus is transmitted to humans through the bites of infected Aedes mosquitoes, principally Aedes aegypti. 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 rural settings. Reported case fatality rates for the region are approximately 1%, but in India, Indonesia and Myanmar, focal outbreaks away from the urban areas have reported case-fatality rates of 3-5%.
For a disease that is complex in its manifestations, management is relatively simple, inexpensive and very effective in saving lives so long as correct and timely interventions are instituted. The key is early recognition and understanding of the clinical problems during the different phases of the disease, leading to a rational approach to case management and a good clinical outcome. “Dengue is one disease entity with different clinical presentations and often with unpredictable clinical evolution and outcome”.

AIMS AND OBJECTIVES

• To assess the clinical profile of children less than 12 years admitted with dengue fever in the department of pediatrics.
• To try to draw conclusions from the data obtained to detect any changing patterns in clinical presentation from the current epidemic.

MATERIALS AND METHODS
The study was undertaken as a hospital-based descriptive study with prospective data collection.

Inclusion Criteria
All children with clinical features suggestive of dengue fever along with a positive NS1 antigen who were admitted to a
tertiary care hospital during a 6-month period from July to December 2015 were selected for this study.

**Exclusion Criteria**

Anyone who refused consent to be a part of the study was excluded.

The information was collected using a questionnaire developed and based on a review of literature. Detailed history was elicited and meticulous examination done. NS1 antigen and IgM dengue antibody were estimated using capture ELISA. Other routine and specific investigations were also done depending on the situation and the children were serially monitored till improvement. Diagnosis of dengue fever, dengue fever with warning signs and severe dengue was based on the WHO guidelines.²

**RESULTS**

Our study included 42 children between the age group of 1 to 12. The mean age of presentation was 7.7 years. Fever was the most common symptom occurring in all cases. This was followed by nausea and vomiting (67%), abdominal pain (43%), malaise (40%), headache (33%) myalgia (26%), and loose stools (23%). Hemorrhagic manifestations were rare (7%) and included 2 cases of skin bleeds and 1 case of epistaxis. The other symptoms recorded were facial puffiness (14%), rash (12%), sore throat (5%) and retro orbital pain (5%). 74% of cases reported of having family members affected with the disease.

Hepatomegaly was seen in 29% of cases. Hess test was positive in 26% of cases.

Important complications that were noted were seizure, ascites, pleural effusion and myocarditis in one case each. Hypotension was seen in 19% of cases and hence these were classified as severe dengue.

33% had dengue fever, 48% had dengue fever with warning signs and 19% had severe dengue.

Lab investigations showed leucopenia in 75% cases, thrombocytopenia in 43% and raised HCT (>40%) in 19% of cases. All cases were positive for NS1 antigen, while 14.2% had Ig M positivity. None of the cases were positive for Ig G.

Intravenous fluids were used in 93%, with Normal Saline being the most preferred fluid, being used in 93% of cases. 16% of children required continued use of IV fluids beyond 96 hours of admission. ORS was used in 12% of children, mainly in mild cases and following improvement. None of the cases required colloids or blood transfusions.

Concomitant use of antibiotics was seen in 84% of cases, which included 38% receiving intravenous antibiotics and 46% oral antibiotics.

**DISCUSSION**

Kerala has been now seeing several epidemics of dengue over the last decade. Children are now being affected more than ever before. A study conducted in Kerala in 2003 showed that adults more than 20 years were more likely to suffer from dengue infections mainly because of exposure to mosquitoes in their workplace.² Similar findings were noted in several other studies too.⁴⁻¹⁰ However in our study the mean age of presentation was 7.7 years with the youngest child affected being just 1 year old. A study from Mumbai in 2005 reported a median age of 6 years at presentation.¹¹ This means that the infection rates are increasing and that vector control measures are grossly inadequate. The male to female ratio was roughly equal at 1:1:1. A recent study by Mishra et al found significant difference between the sexes whereas other studies did not find any.¹²

In our study fever was seen in all the cases, with nausea, vomiting and abdominal pain the next common symptoms. These findings are fairly consistent with a study from Kerala by Daniel et al³ The mean duration of fever before presentation was 4.5 days. A recent study by Sriram et al reported that next to fever, conjunctival congestion was the most common symptom.¹³ This was not seen in our study. Retro orbital pain also was seen only in 5% of children in our study compared to 50% in that study. This is probably because the mean age of children in our study was 7 years where children may not be able localize pain accurately.

Diarrhoea was seen in 23% children in our study. Kumar et al had not recorded this as a presenting symptom.¹⁴ while another study found the incidence as high as 46%.

Respiratory complaints like cough were also absent in our study. Lee et al and Chau et al had reported cough in 37% and 47% of patients respectively.¹⁵,¹⁶,¹⁷

Hemorrhagic manifestations also were rare in this epidemic, with an incidence of only 7%. One child had epistaxis which was a finding seen in children in other
studies too. However a positive Hess test was observed in 26% of cases. The studies by Sriram et al. and Daniel et al had incidences of 19% and 15% respectively. Other studies in the past have reported incidences as high as 80%.

Low proportion of positive tourniquet test in Indian studies may be due to the darker skin colour in Indian children.

Hepatomegaly (29%) was the most common physical finding which was in tune with other studies. Important complications noted were seizure, ascites, pleural effusion and myocarditis which are similar to previous studies. However, the incidence was very low with recovery being the rule. Mishra et al had reported pleural effusion in as high as 25% of cases.

Severe dengue infection was seen only in 19% of the cases, in comparison to 39% in the study by Sriram et al. The recent study by Mishra et al quoted a figure of 13%. However, both studies reported deaths while no deaths occurred in our study. This may be because this epidemic was caused by a primary infection as evidenced by absence of IgG positivity in all cases.

Haemoconcentration (HCT >40%) was seen in 19% of cases which was similar to that recorded by Kabilan et al. However there are no clear-cut guidelines for haemoconcentration in the Indian population. Mishra et al too found low incidence of haemoconcentration, but they had used a cut off of 36.3%, which if used in our study would have resulted in a value as high as 86%. Thrombocytopenia (PLt. <100,000) was seen only in 43% in our study in comparison to 90% seen in one study. Most other studies too reported higher incidence of thrombocytopenia.

Leukopenia, (WBC < 4000/mm³) was found in 75% of children and was thus the most common laboratory finding. It was also higher than values seen in most other studies. A study by Malavige et al had found it in 27.3% cases only. While Mishra et al reported it in 25% cases. Liver function tests were fairly normal in all cases. High SGPT was seen only in 9% of cases with values in the range of 200 to 300 IU/l. Corresponding incidence was 47% in the study by Mishra et al.

IgM seropositivity was seen only in 14% of children, compared to very high detection rates in other studies. This was probably because most children were tested at the time of admission and repeat testing was not done as the diagnosis was obtained by NS1 positivity and the patients improved quickly.

Intravenous fluids were used in 93% of cases, with NS being the fluid of choice. ORS was used for mild cases which improved quickly. Mishra et al reported the use of intra venous fluids only in 27% cases, that too mainly in cases diagnosed as severe dengue.

A very high percentage of children (84%) received antibiotics with 38% receiving intra venous injections. This is against the traditional teaching that utility of antibiotics in dengue fever is minimal.

**CONCLUSION**

In our study, fever was the most common manifestation, followed by nausea and vomiting (67%), abdominal pain (43%), malaise (40%), headache (33%) myalgia (26%), and loose stools (23%).

Our study shows that an epidemiological shift has occurred in Kerala with more of the younger population being affected. All the cases in the current epidemic were primary infections indicating spreading of dengue to newer areas. Though 19% of children had severe dengue, complications were rare with no fatalities reported. Leukopenia was the most common lab abnormality.

**ACKNOWLEDGEMENT**

The authors acknowledge all our colleagues and other staff in the department for helping in collecting the data for the study.

**REFERENCES**


