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Original Research Article

Clinical profile and outcome in children with dengue fever

Prasad Nayak N.[1]*, Zaheer Ahamed[2], Roshan Maben[3]

[1]Department of Pediatrics, Yenepoya Medical College, Mangalore, Karnataka, India
[2]Consultant Pediatrician, My Baby Clinic, Falnir, Mangalore, Karnataka, India
[3]Department of Pediatrics, A. J. Institute of Medical Sciences, Mangalore, Karnataka, India

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***Correspondence:**
Dr. Prasad Nayak N.,
E-mail: prasad_nayak2001@yahoo.com

ABSTRACT

Background: Dengue fever (DF) has emerged as a serious health threat not only in India but worldwide. Mangalore, a coastal city of Karnataka has seen an alarming rise in dengue fever (DF) over the last decade. So, it is of utmost importance to study the clinical profile and treatment outcome in children suffering from dengue fever.
Methods: A retrospective study was conducted to analyze the clinical profiles and treatment outcome. The case files of 52 children admitted with dengue fever over last 5 years (2009-2014) in Pediatric department in a tertiary care centre located in Mangalore, Karnataka were included in this study. The data was collected from the Medical Records department. Statistical analysis was done by using SPSS 16.0.
Results: Children aged 4-12 years are more affected (59.6%). Fever was present in all the cases. 63.5% of the cases had petechiae and other bleeding manifestations were seen in 9.6% of the cases. Poor intake was seen in all the cases. Abdominal pain, maculopapular rash, respiratory distress, retro-orbital pain, convulsions were present in 96.2%,50%,15.4%,78.8% and 1.9% respectively. Hypotension in 86.5%, hepatomegaly in 65.4% and vomiting was seen in 100% of cases. ICU admission was done for 41 patients (78.8%). However, there was no mortality seen.
Conclusions: Early diagnosis and prompt management will help in preventing serious morbidity and mortality in pediatric age group.

Keywords: Dengue fever, Dengue hemorrhagic fever (DHF), Dengue shock syndrome (DSS)

INTRODUCTION

The severity of dengue viral infection ranges from mild subclinical infection which mimics any other viral episode to severe life-threatening dengue shock syndrome**.** Malaria is one of the major vector borne diseases in Mangalore, a major cause of morbidity in children and cause for hospital admission, now dengue viral infection is emerging as one of the major challenge for pediatricians to diagnose and treat the disease.

NS-1 antigen, IgM and IgG levels are the major laboratory tools used commonly to diagnose dengue viral infection, however clinical signs and symptoms play an important role in the diagnosis of dengue viral infection.[1] NS-1 antigen appears with febrile episode and may persist for 9 days and helps in early diagnosis of dengue fever, however the false positive tests may be present in other viral infections like Flaviviridae group.

In primary infection of dengue, IgM is positive by 5-7 days in 80%, titre peaks by 2 weeks and disappears by 2 months. But in secondary infection, it is slower and lower. Whereas, in primary infection, IgG appears by 14 days, peaks by 3 weeks and remain high for 2-3 months and later declines and remains life time.[2] In secondary infection, IgG response is quick, and levels are higher. This appears by 5th day, peaks by 2 weeks and remains

high for 2-3 months. Later declines and remains for life time.

Unfortunately, there is no single lab test available which gives accurate diagnosis at the onset of illness. By the time lab reports confirm the diagnosis, the clinical picture is more evident. However, NS-1Ag remains an important tool for the diagnosis in the first few days of fever with suspicion of dengue fever. Majority of dengue infections are self-limiting, but complications may cause high morbidity and mortality.[3] *Aedes albopictus* and *Aedes aegypti* are the most common types of mosquitoes and DENV-2 is the common serotype.[4]

METHODS

Diagnosed cases of dengue fever admitted from December 2009 to November 2014 were included in this study and analyzed. Data from their case records, examination findings and lab findings were obtained. Clinical features, blood pressure, platelet count, packed RBC, NS1 Ag, dengue IgM and IgG were the important parameters used to diagnose the DF.

Age group was subdivided in to less than 1 year, 1-4 years, 4-12 years, and more than 12 years. Blood Pressure was defined according to the age and sex dependent normogram, platelet count categorized as less than 50000, 50000-100000, 100000-150000 and more than 150000. PCV variations, Bleeding parameters and liver functions were noted. IV fluid management, admission to ICU, need of ventilation were recorded. Data was recorded in SPSS 16.0 and statistical results were obtained.

RESULTS

Table 1: Gender distribution.

Gender	Cases	Percentage
Male	25	48.1
Female	27	51.9
Total	52	100

Males and Females are almost equally affected.

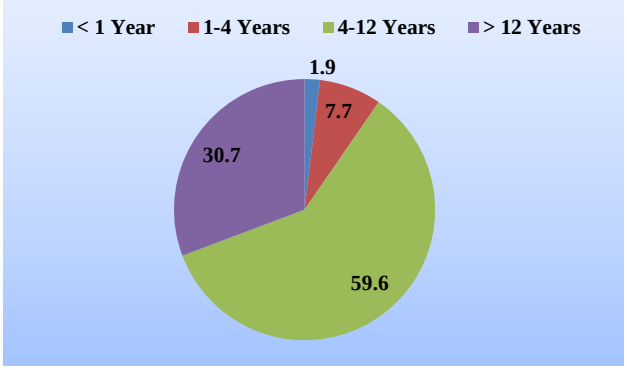

Figure 1: Age distribution.

Least affected group was less than 1 year (1.9%) and most affected group was more 4-12 years (59.6%).

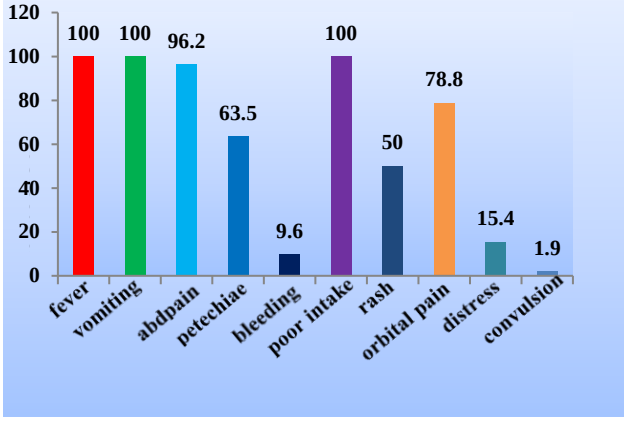

Figure 2: Clinical manifestations of dengue fever.

Fever was main presenting complaint in all the 52 cases. Petechiae was present in 63.5% cases, however bleeding manifestations were observed in the form of GI bleed in 9.6% of the cases. Poor intake was present in all the 52 cases and abdominal pain was seen in 96.2% of the cases. Maculopapular rash in 50%, respiratory distress in 15.4%, retro-orbital pain in 41%, vomiting in 100% and convulsion was seen in one case.

Elevated haematocrit was seen in 49 cases (94.2%), hypotension seen in 86.5%, hepatomegaly seen in 65.4%, packed cell volume raised in 94.2%, low platelet count observed in 55%, abnormal LFT seen in 61.5%, abnormal amylase seen in 3.8% of the cases. Renal function test was normal in 100% whereas 7 cases had platelet count less than 50000.

Table 2: Severity of thrombocytopenia in dengue fever.

PLT	No. of cases	Percentage
>150000	23	44.2
100000-150000	03	5.8
50000-100000	19	36.5
<50000	07	13.5

Table 3: Lab parameters of dengue fever.

Parameters	Positive	Percentage
NS_1Ag +ve	15	28.8
IgM+ve, IgG+ve and NS-ve	37	71.2
NS1+ve, IgM+ve and IgG-ve	10	19.2
IgM-ve and IgG+ve	0	0
NS1+ve, IgM-ve and IgG-ve	5	9.6

Dengue NS-1Ag was positive in 15 cases, out of which 10 cases were associated with positive IgM and 5 cases

were associated with negative IgM and IgG. Whereas IgM and IgG were positive in 37 cases (71.2%), NS1 negative in all the 37 cases, IgM positive and IgG negative in 10 cases (19.2%) and all the 10 cases NS-1 antigen were positive. Both IgM and IgG were negative in 5 cases (9.6%). PICU admission was done for 41 cases (78.8%) and ventilation was required for 1 case (1.9%).

DISCUSSION

In present study, maximum number of cases (59.6%) were between 4-12 years, whereas study done by Dhooria et al showed 59% cases were 10-15 years and 3.7% cases were infants. Faridi et al showed more than 76% of the cases were above 6 years. According to the study done by Aneja et al, predominant age group affected was 6 years and less, 9% of the cases were infants.[5] Majority of the patients were males in many studies, maybe they are outdoors for more time compare to females; study done by Shubhakar Mishra et al depicts 77.3% are male and 22.7% are female children are affected. However, present study showed almost equal distribution with 25 males and 27 females. Fever was the commonest symptom according to present study and similar results seen in study done by Maimoona M, Aisha Sajid et al.[6,7] Present study showed petechiae in 33 cases (63.5%), in which 5 (9.6%) cases were associated with gastric bleed as evidenced by brownish GI aspirate and malena, which is comparable to study done by Dhooria et al where in petechiae was in 85% cases and GI bleed was in 6 % cases. In another study, done by Ratgiri et al showed petechiae in 18% of cases and GI bleed in 22% cases.[8] Study done by Vijay Gupta et al showed spontaneous bleeding manifestation seen in 43 (55.1%) cases with DSS and 158 (39.6%) cases with DHF.[9] Study done by Ahamed et al and Rachel et al depicts GI bleed was the main manifestation compared to petechiae.[10,11] Study done by Sivabalan et al depicts a combination of biphasic fever, heamoconcentration, platelet count less than 50000/mm^3 and elevated ALT had a sensitivity of 79.2%,specificity of 64.7%, with a positive predictive value of 70% and negative predictive value of 75% in predicting spontaneous bleeding in dengue.[12]

According to present study the key findings are fever (100%), poor intake (100%), vomiting (100%), abdominal pain (96.2%), hypotension (86.5%), retroorbital pain (78.8%) and hepatomegaly in (65.4%). Whereas study done by Kamala Kannan et al showed fever in 94.6%, retroorbital pain 51.3%, palmar erythema 62.8%.[13] Dhooria et al reported fever in 91%, vomiting 34%, poor intake 21%, abdominal pain 16%, Ratgeri reported fever in 100%, vomiting in 82%, abdominal pain61%, headache 22%, and hepatomegaly in 87 %.

Amrita Roy et al done a study showed, Hepatomegaly (80.8%), Jaundice (68%), Raised Aspartate transaminase, Alanine trasaminase and prolonged Prothrombin time (41.7%) and reduced serum albumin in (56%).[14]

Skin rash in the form of dengue flush was seen in 50% of cases in present study. Whereas maculopapular rash was seen in 80% of cases in a study conducted by Waterman S. H et al.[15]

Respiratory distress is seen in 15.4% cases in present study, mainly due to associated bilateral pleural effusion, however none of the cases met the criteria of Acute Respiratory Distress Syndrome (ARDS). Study conducted by Shubhakar Mishra et al depicts pleural effusion in 25.7%, whereas 30.3% cases were having pleural effusion in the study conducted by Ashwin Kumar et al.

In present study one child had convulsion and altered sensorium suspected to have dengue encephalitis. Whereas study done by Dhooria et al showed three patients had altered sensorium and one patient had persistent low GCS and seizures. Haematocrit was elevated in 94% cases, however authors did not have baseline PCV so mainly used the levels to titer the fluid management. About 44.2% cases had platelet count >150000-200000, 5.8% cases 100000-150000, 36.5% cases 500000-100000, 13.5% cases 20000-50000 and none of the cases less than 20000/cumm. Study conducted by Sri Ram Pothpregada et al showed 2.7% cases had platelet count <10000, 22.2% cases had 50000-100000, 43.7% patients had counts of 1-1.5 lakh, and 17.6% patients had counts more than 1.5 lakhs.

Normal liver function was observed in 61.5% of the cases, 20 (38.5%) cases had abnormal LFT, Elevated ALT, AST seen in 9 (17.3%) cases, Elevated TB, DB, ALT and AST seen in 1 (1.9%) case, isolated rise in AST and ALP seen in 1 (9.6%) case each. Normal PT and APTT seen in 49 cases (94.2%), abnormal PT and normal APTT were seen in 2 (3.8%) cases and abnormal PT, APTT seen in 1 (1.9%) case each. The study done by Sri Ram showed raised AST in 93%, raised ALT in 78%, raised ALP in 57% and prolonged prothrombin time (PT) is seen in 20% of the cases. May be this disparity in result is due to serum sample obtained at the early stages of the disease. Total number of admission in Pediatric ICU were 41 (78.8%), though they all did not meet the criteria of PICU admission, admitted for better monitoring and early detection of deterioration of the patient. One child was ventilated due to severe respiratory distress; however, this child did not meet the criteria of diagnosing ARDS and child was extubated within 72 hours.

CONCLUSION

Dengue viral fever during its initial presentation mimics any of the viral illness, so it is important to keep high index of suspicion when characteristic features like fever, headache vomiting, abdominal pain and one should look carefully for petechial rashes. It is also important to know whether child is coming from an endemic area or any other family member suffering from dengue fever. Early diagnosis and initiation of supportive treatment should be

the main goal to avoid the serious life-threatening complications of the dengue viral infection.

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