

CLINICO-HAEMATOLOGICAL PROFILE AND OUTCOME OF DENGUE FEVER IN CHILDREN- A RETROSPECTIVE STUDY

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ABSTRACT

BACKGROUND

The incidence of dengue fever has dramatically grown in the recent years. The increasing magnitude of the problem with its changing epidemiology is an important public health problem. The present study was undertaken to evaluate clinical profile, haematological parameters and outcome in children admitted in a tertiary care teaching hospital.

MATERIALS AND METHODS

This is a retrospective descriptive study. Children upto 12 years admitted with confirmed dengue fever were included in the study group. Case records were analysed to obtain data on clinical characteristics, haematological parameters, treatment received and outcome.

RESULTS

A total of 519 cases including 274 (52.8%) boys and 245 (47.2%) girls were included in the study. Of which 245 (47.2%) were dengue fever, 230 (44.3%) were dengue with warning signs and 44 (8.5%) with severe dengue as per the revised WHO 2009 case definition. Maximum number of cases were recorded in the year 2013. Fever was the most common presenting feature (100%) followed by vomiting (49.3%), though thrombocytopenia was documented in 73% cases. A total of four children expired in the study group, the case fatality being 0.8%.

CONCLUSION

Dengue fever had got wide spectrum of clinical manifestations; prompt diagnosis and immediate treatment gives good recovery.

KEYWORDS

Dengue Fever, Children, Clinical Profile, Haematological Profile.

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BACKGROUND

The incidence of dengue has grown dramatically around the world in recent decades. The actual number of dengue cases are underreported and many cases are misclassified. One recent estimate indicates 390 million dengue infections per year, of which 96 million manifests clinically.⁽¹⁾ The people in 128 countries are at risk of infection with dengue virus.⁽²⁾ America, South East Asia and Western pacific region are the most seriously affected. According to the Indian Ministry of Health and Family Welfare, dengue fever cases are on a rise in India with 1,29,166 cases in the year 2016 only.⁽³⁾

Dengue is a febrile illness caused by infection with one of the four dengue viruses transmitted by *Aedes aegypti* or *Aedes albopictus* mosquitoes during taking of a blood meal. Infections may be asymptomatic or present with a broad range of clinical manifestations including a mild febrile illness to a life-threatening shock syndrome.^(4,5) The incubation period of dengue fever ranges from 3 - 14 days.

Symptoms typically develops between 4 to 7 days after the bite of an infected mosquito. After the incubation period the illness begins abruptly and in patients with moderate-to-severe disease is followed by three phases- febrile, critical and recovery.⁽⁶⁾ Due to its dynamic nature the severity of disease will be apparent during transition of the febrile to the afebrile phase. Patients with suspected dengue should be assessed carefully and early recognition of progression to severe disease is essential with initiation of more aggressive therapy. The new WHO classification consists of the following categories: Dengue without warning signs, dengue with warning signs and severe dengue.⁽⁷⁾

Laboratory diagnosis of dengue virus infection is established directly by detection of virus components in serum or indirectly by serology. During the first week of illness, the diagnosis is established by RTPCR assay or via detection of NS1 antigen. In primary infection, the sensitivity of NS1 detection can exceed 90 percent. In secondary infection sensitivity is lower, 60 - 80 percent.⁽⁷⁾ IgM can be detected as early as four days after the onset of illness. Detection of IgM in a single specimen is widely used to establish a presumptive diagnosis. Dengue fever is known to have complex clinical and haematological presentation. A proper clinical and haematological monitoring can go a long way in reducing mortality and morbidity. The present study was undertaken to evaluate the clinical features, haematological parameters and outcome of dengue fever cases.

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Objectives

1. To study the clinical and haematological parameters of dengue in hospitalised children upto 12 years.
2. To study the outcome of cases admitted.

MATERIALS AND METHODS

This was a retrospective descriptive study conducted in Department of Paediatrics, Government Medical College, Kottayam. The study period was from January 2012 - December 2016. The study was approved by Institutional Ethics Committee. All the children upto 12 years with confirmed dengue fever done by NS1 ELISA/ IgM antibody were included in the study. Patients were divided into 3 groups- Dengue without warning signs (DF), Dengue with warning signs (DWS) and Severe Dengue (SD) based on the revised WHO 2009 case definition.⁽⁷⁾ All the clinical haematological and treatment details during the study period were considered. The data were entered and statistically analysed using SPSS version 22.

RESULTS

A total of 519 children were hospitalised with confirmed dengue fever during the study period, of which 274 (52.8%) were boys and 245 (47.2%) were girls. The year 2013 had the maximum reported cases, 247 (47.6%). In the 519 cases 245 (47.2%) had dengue fever, 230 (44.3%) had dengue with warning signs and 44 (8.5%) had severe dengue. Maximum number of cases was in the age group of 7 - 12 years.

Year	Dengue Fever	Dengue with Warning Signs	Severe Dengue	Total Cases	Death
2012	36	30	7	73	1
2013	115	108	24	247	2
2014	12	16	1	29	0
2016	44	35	4	83	0
2015	38	41	8	87	1
Total	245	230	44	519	4

Table 1. Year Wise Distribution of Dengue Fever

Fever was present in all the 519 cases (100%) followed by vomiting 256 (49.3%), abdominal pain 172 (33.1%), myalgia 156 (30.1%), rash 89 (17.1%), headache 74 (14.3%), loose stools 50 (9.6%), bleeding 35 (6.7%), cough 28 (5.4%) and seizures 9 (1.7%).

Symptoms	Number	%
Fever	519	100.0%
Vomiting	256	49.3%
Abdominal Pain	172	33.1%
Myalgia	156	30.1%
Rash	89	17.1%
Headache	74	14.3%
Loose Stool	50	9.6%
Bleeding	35	6.7%
Cough	28	5.4%
Seizures	9	1.7%

Table 2. Clinical Profile of Children with Dengue Fever

The following pattern were observed in the haematological profile: Mean haemoglobin (11.79), mean total leukocyte count (5777.2), mean neutrophil count (46.94) and mean lymphocyte count (47.25) respectively. The mean platelet count was 1.29 lakhs and mean haematocrit

was 36.34 in the present study. Thrombocytopenia was present in 380 (73%) of cases, of which only 41 cases had platelet count less than 50,000. The average duration of hospital stay was 4 - 6 days (67%).

	Total Cases	Mean and SD
Haemoglobin	519	11.791 ± 5.10 (11.351 - 12.231)
Total Count	519	5777.28 ± 6269.83 (5235.56 - 6319.01)
Neutrophils	519	46.94 ± 18.18 (45.37 - 48.50)
Lymphocytes	519	47.25 ± 18.57 (45.65 - 48.85)
Eosinophils	519	3.613 ± 2.56 (3.391 - 3.834)
Monocytes	519	2.05 ± 1.93 (1.89 - 2.22)
Platelet Count	519	1.295 ± 1.53 (1.16 - 1.4286)
Haematocrit	519	36.347 ± 4.10 (35.99 - 36.702)

Table 3. Haematological Profile of Patients with Dengue Fever

Majority of patients were treated with IV fluids (49.5%) followed by antipyretics in 215 patients (41.4%). Antibiotics was given in 32 (6.2%) patients, while blood products was used in 15 (2.9%) patients. Most common blood product used was platelet transfusion.

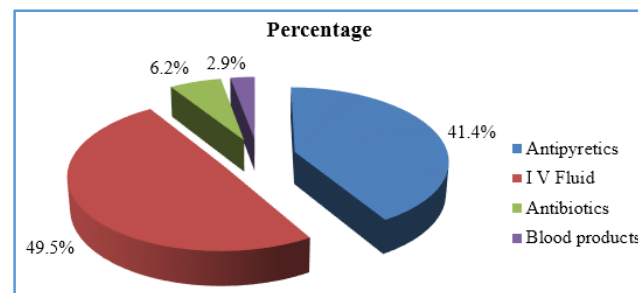


Figure 1. Treatment Administered to the Children with Dengue

A total of four patients expired out of 519 patients, the case fatality rate being 0.8%.

DISCUSSION

Dengue fever is becoming common in tropical countries like India due to climatic changes, urbanisation and inadequate waste management. The present study describes clinical manifestations, haematological profile and outcome of children admitted in a tertiary level teaching hospital from January 2012 to December 2016.

In the present study, males were more affected than females. The observation is similar to the previously observed data.^(8,9) Maximum number of cases were reported in the children of 7 - 12 years. The same age distribution is found in previous studies.^(8,9)

Of the study population 47.2% had dengue fever, 44.3% had dengue with warning signs and 8.5% had severe dengue. This is almost similar to the observation of I Majumdar et al with 47% cases as dengue fever and 42% as dengue with warning signs.⁽¹⁰⁾

All the patients had fever as a part of case definition. The next common presentation was vomiting (49.3%), abdominal pain (33%), myalgia (30%) and rash (17.1%). Shahana et al showed a similar pattern of clinical features.⁽¹¹⁾ Bleeding manifestation was present in 6.7% of cases. This is in sharp contrast to other studies,^(9,11) where bleeding was seen in 44.5% and 16% respectively.

The mean haemoglobin was 11.791, mean total leukocyte count was 5777.1 and mean haematocrit was 36.347. Modi et al showed a comparable haematological profile.⁽¹²⁾ Thrombocytopenia was found in 73% of cases. In a similar study by Prathyusha et al showed thrombocytopenia in 85% of cases.⁽¹³⁾ Bleeding was not directly related to platelet count as found in previous studies.^(10,14) The most common bleeding manifestation was positive tourniquet test followed by petechiae.

The average period of hospitalisation was 4 - 6 days. Majority of patients received IV fluids as treatment modality (49.5%), while blood products was used only in 15 (2.9%) patients. In the study by Pothapregada et al, only 6.5% received platelet transfusion.⁽¹⁵⁾ Previous studies also show no role of prophylactic platelet transfusion in patients with severe thrombocytopenia in the absence of active bleeding.^(16,17)

Though 519 cases were present during the study period, only 4 patients died due to severe dengue. The case fatality rate being 0.8%. The same case fatality rate is found in previous studies.^(9,18)

CONCLUSION

Dengue fever cases are on a rise in tropical countries like India. It has wide spectrum of clinical manifestations ranging from non-severe to severe form of leukopenia and thrombocytopenia. They are the prima facie associated with dengue fever. There is no absolute relationship between platelet count and severity of bleeding. For a disease that is complex in its manifestation, management is relatively simple and inexpensive. Prompt diagnosis and immediate treatment gives good recovery.

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