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 up to 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.


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.8 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.
### 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. 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 (52.9%) 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 89 (17.1%) had severe dengue. Maximum number of cases was in the age group of 7 - 12 years.

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

**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 92 (17.1%), headache 74 (14.3%), loose stools 50 (9.6%), bleeding 35 (6.7%), cough 28 (5.4%) and seizures 9 (1.7%).

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>519</td>
<td>100.0%</td>
</tr>
<tr>
<td>Vomiting</td>
<td>256</td>
<td>49.3%</td>
</tr>
<tr>
<td>Abdominal Pain</td>
<td>172</td>
<td>33.1%</td>
</tr>
<tr>
<td>Myalgia</td>
<td>156</td>
<td>30.1%</td>
</tr>
<tr>
<td>Rash</td>
<td>92</td>
<td>17.1%</td>
</tr>
<tr>
<td>Headache</td>
<td>74</td>
<td>14.3%</td>
</tr>
<tr>
<td>Loose Stool</td>
<td>50</td>
<td>9.6%</td>
</tr>
<tr>
<td>Bleeding</td>
<td>35</td>
<td>6.7%</td>
</tr>
<tr>
<td>Cough</td>
<td>28</td>
<td>5.4%</td>
</tr>
<tr>
<td>Seizures</td>
<td>9</td>
<td>1.7%</td>
</tr>
</tbody>
</table>

**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. Thrombocytopaenia 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%).

### 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. Maximum number of cases were reported in the children of 7 - 12 years. The same age distribution is found in previous studies.

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.
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. Bleeding manifestation was present in 6.7% of cases. This is in sharp contrast to other studies, where bleeding was seen in 44.5% and 16% respectively.

The mean haemoglobin was 11.791, mean total leucocyte count was 5777.1 and mean haematocrit was 36.347. Mod et al showed a comparable haematological profile. Thrombocytopenia was found in 73% of cases. In a similar study by Prathyusha et al showed thrombocytopenia in 85% of cases. Bleeding was not directly related to platelet count as found in previous studies. 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. Previous studies also show no role of prophylactic platelet transfusion in patients with severe thrombocytopenia in the absence of active bleeding.

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.

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 leucopaenia 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.

REFERENCES