INCIDENCE OF DENGUE HEMORRHAGIC FEVER IN CHILDREN: A REPORT FROM MELMARUVATHUR TAMILNADU, INDIA

Saraswathy MP *, Sankari K 1, Sakhthi Gnanavel 1, Sripriya Dinesh 2, Lakshmi priya 2

1Department of Microbiology, Melmaruvathur Adhiparasakthi Institute of Medical Sciences and Research, The TN Dr. M.G.R Medical University, Melmaruvathur-603 319, India.
2Institute of Microbiology, Madras Medical College, Chennai, The TN Dr.M.G.R Medical University, Melmaruvathur-603 319 India

*Email: drmmpsaraswathy@gmail.com

Received on: 13/12/12 Revised on: 20/02/13 Accepted on: 25/02/13

ABSTRACT

Dengue is a mosquito borne infection that in recent decades has become a major international public health concern. WHO currently estimated that 50 million dengue infections occur worldwide every year. Also dengue hemorrhagic fever is a leading cause of serious illness and death among children in Asian countries including India. Hence we planned to conduct a study in paediatric population. The study was conducted in department of microbiology from August 2011 to October 2012. A total of ninety children presenting with fever for more than three days were included in the study. Blood samples were analysed for hematologic parameters such as platelet count, total leukocyte count, differential leukocyte count. Serological diagnosis of dengue was done by IgG and IgM ELISA. Out of 90 children screened, 43(45.5%) were positive for dengue. Of which, 16 (39%) had dengue and 25 (61%) had dengue hemorrhagic fever. Thrombocytopenia (96%), elevated aminotransferases (96%), Abdominal pain (92%), hepatomegaly (92%) were the common clinical presentations among children with dengue. This study facilitates distinguished detection of DHF from dengue fever based on warning symptoms and hematologic parameters, which is essential for optimal management of patient. Current study strongly suggests that detection of liver enzymes (aminotransferases) elevation can be used as an important marker in children progressing to DHF.

Key Words: Dengue fever, Dengue hemorrhagic fever, Dengue in children, Hepatic involvement in DHF

INTRODUCTION

Dengue is a mosquito -borne viral infection found in tropical and sub-tropical regions around the world. In recent years, transmission has increased predominantly in urban and semi-urban areas and has become a major global public health concern1. The symptoms range from a mild dengue fever (DF), dengue hemorrhagic fever (DHF) & dengue shock syndrome (DSS). Worldwide, children younger than 15 years make up 90% of DHF cases2. It is a significant cause of paediatric morbidity and mortality3 in many developing countries including India4.

The clinical diagnosis of DHF is based on four main characteristic manifestations ( WHO 1997)5: (i) continuous high grade fever lasting 2-7 days (ii) haemorrhagic tendency as shown by a positive tourniquet test, petechiae or epistaxis (iii) evidence of plasma leakage manifested by hemoconcentration, pleural effusion and ascitis etc. The severity of DHF is categorized into four grades (WHO 1997)5: grade I being the mildest and grade IV being most severe, with circulatory failure manifested by a rapid and weak pulse with narrowing of pulse pressure (20mmHg) or hypotension with the presence of cold clammy skin and restlessness. There may be prolonged shock in which pulse and blood pressure are not detectable (DSS).

Dengue- Indian scenario

The first epidemic of clinical dengue-like illness in India was recorded in Madras in 17806. The first major wide spread epidemics of DHF/ DSS occurred in India in 1996 involving areas around Delhi7 and Lucknow8 and then it spread to all over the country9.10. The vector has adapted to extremes of warm and cold weather resulting in occurrence of dengue cases round the year. Now, Dengue is endemic in India with frequent epidemics of DF/ DHF. Several factors may influence disease severity, including host factors, virus serotype or genotype, sequence of virus infection, differences in dengue reactive antibody and T cell response11. In hyperendemic areas, dengue fever & DHF affects mainly children less than 15 years of age6. Shock and plasma leakage seem to be more prevalent in younger patients, the frequency of internal haemorrhage augments as age increases12. The outcome of DHF & DSS depends largely on early diagnosis and the immediate replacement of fluid. DHF can be distinguished from DF by the presence of increased vascular permeability (plasma leakage syndrome) and marked thrombocytopenia (<1,00,000/µl) associated with bleeding, hepatomegaly and or abnormal liver functions13. Though uncomplicated dengue fever occurs both in adults and children, till recently DHF in Chennai has been predominantly restricted to children14.16. Since DHF often manifest with atypical presentation in children, many of these may remain unrecognized due to lack of awareness among primary care physicians. This study was intended to highlight the warning signs and early haematological changes in children with DHF.

MATERIALS & METHODS

This study was conducted at department of microbiology, Melmaruvathur Adhiparasakthi Institute of Medical sciences and Research, Melmaruvathur from August 2011 to October 2012. All suspected dengue patients between 0-12 years of age, admitted to medical wards with the history of acute febrile illness with myalgia, arthralgia, headache, retro orbital pain, abdominal pain, nausea and vomiting, bleeding, hypotension or thrombocytopenia were included in the study. A detailed history as well as general and systemic clinical examination was recorded. Patients were classified as dengue fever, dengue hemorrhagic fever or dengue shock syndrome according to WHO guidelines5. Approximately 2-2.5ml of blood sample was received, serum separated and subjected to ELISA. Laboratory diagnosis of dengue was
established by performing IgM ELISA & IgG ELISA using kit from NovaLisa, NOVATEC immunodiagnosticsa GMBH.

Ethical considerations

Ethical approval (MAPIMS/IEC/52/2012) was obtained from Institutional Ethical Committee and informed written consent was obtained from parents /guardians before enrolment into study.

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Dengue hemorrhagic fever(no:25)</th>
<th>Dengue fever(no:16)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal pain</td>
<td>24</td>
<td>96</td>
</tr>
<tr>
<td>Ascites</td>
<td>22</td>
<td>88</td>
</tr>
<tr>
<td>Hepatomegaly</td>
<td>23</td>
<td>92</td>
</tr>
<tr>
<td>Thrombocytopenia</td>
<td>25</td>
<td>100</td>
</tr>
<tr>
<td>Elevated liver enzymes</td>
<td>24</td>
<td>96</td>
</tr>
<tr>
<td>Vomiting</td>
<td>15</td>
<td>60</td>
</tr>
<tr>
<td>Hemorrhagic manifestations</td>
<td>25</td>
<td>100</td>
</tr>
<tr>
<td>Splenomegaly (by USG)</td>
<td>12</td>
<td>48</td>
</tr>
<tr>
<td>Cholecytitis (by USG)</td>
<td>9</td>
<td>36</td>
</tr>
</tbody>
</table>

Table 3 -Warning symptoms observed in Dengue hemorrhagic fever & Dengue fever

RESULTS

A total of ninety children with suspected dengue fever were enrolled in this study of which sixty seven (74%) patients were male and thirty three (36%) were female children (Table-1). Among 41 (45.5%) laboratory confirmed cases, sixteen (39%) patients had DF while twenty five (61%) patients had DHF (Table-2).

The rate of dengue positivity was high among 1-5 year old children (57%), followed by 6-12 years (29%). DF and DHF were common in male children than in female children. Thrombocytopenia (96%), elevated aminotransferases (96%), hematocrit (96%), abdominal pain (92%), hepatomegaly (92%) were the common clinical presentations among children with DHF (Table-3).

DISCUSSION

The incidence of atypical presentations in dengue and DHF are more common, especially in children. Moreover the WHO classification does not include unusual manifestations such as encephalopathy, acute hepatic failure, cardiomyopathy and acute respiratory distress syndrome. Although these manifestations are rare, they have been reported from endemic areas. Therefore, determination of risk factors of DHF and DSS are crucial for early diagnosis and prompt management of shock.

In our study, Dengue was common in male (65.8 %) than in female (34%) children. The incidence of dengue was remarkably high during monsoon, which was re-established in our study. This shows that the presence of stagnating water during rain fall favours mosquito breeding. Other important factors involved in transmission include uncontrolled urbanization, international travel, crowding, lack of mosquito control and deterioration of public health infrastructure.

Since it is a tertiary care hospital, the incidence of DHF (61%) were high compared to DF(39%).In our study, children with DHF commonly presented with abdominal pain (96%), elevated liver enzymes (96%), hepatomegaly (92%) along with thrombocytopenia(100%), were similar to the previous studies. Recent studies from India showed that dengue infection is the most important cause of acute hepatic failure in children contributing to 18.5% of the cases. Hematomegaly and elevated liver enzymes, one of the common sign of DHF were distinct in our study. Although, we had many cases of DHF none of them has gone for DSS. Hence, continuous scrutiny of these warning signs can prevent development of DSS.

CONCLUSION

DHF is a severe disease with high fatality rate, early diagnosis is mandatory particularly in children for prompt management. As hepatic involvement is a prominent feature of DHF, estimation of aminotransferases can be used as a surrogate marker for DHF in children.

REFERENCES