DENGUE FEVER- ITS CLINICAL PROFILE, RADIOLOGICAL FINDINGS, HAEMATOLOGICAL AND BIOCHEMICAL PARAMETERS – STUDY FROM A TERTIARY CARE HOSPITAL

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ABSTRACT

BACKGROUND

Dengue is a rapidly progressing self-limiting systemic viral infection transmitted between humans by mosquitoes. About two-fifth of world’s population, mostly those in tropical and sub-tropical countries are at a risk of dengue infection.

MATERIALS AND METHODS

A hospital-based cross-sectional descriptive study was conducted in Rajiv Gandhi Institute of Medical Sciences, Ongole. A total of 233 patients who were clinically diagnosed cases of Dengue with subsequent confirmation by Dengue NS1 Ag/ Dengue IgM were selected in the study. Data was collected using a semi-structured questionnaire, either by direct interview with patients or patient’s relatives and by clinical examination and from relevant investigations.

RESULTS

Out of the 233 study population, majority (44.6%, n= 104) belonged to 40 - 59 years age group. Fever was the most common presenting symptom (99.6%) in the present study followed by myalgia in 60%, headache in 43.8%, joint pain in 35.6% and backache in 28.9%. Majority had low platelet count (68.2%). SGPT was altered in 65.2%, serum albumin in 33% and SGOT in 73.7% of the patients. 16.7% of patients had high random blood sugar level and 7.3% in increased burden of dengue in recent times.

CONCLUSION

Ultrasonographic features like gall bladder wall oedema, pleural effusion and ascites should strongly favour diagnosis of dengue fever in a patient who presents with fever and thrombocytopenia, especially during an epidemic.

KEYWORDS

Dengue Fever, Clinical, Radiological, Haematological, Biochemical Parameters.


BACKGROUND

Dengue is a rapidly progressing self-limiting systemic viral infection transmitted between humans by mosquitoes. Around two-fifth of world’s population, mostly those in tropical and sub-tropical countries, are at a risk of dengue infection.[1] Globally, about 390 million infections, of which 96 million symptomatic cases occur yearly.[2] The region with the highest dengue incidence is in South East Asia, where cycles of epidemics occur every 3 - 5 years.[3] About 1.8 billion of the population at risk for dengue worldwide live in South East Asia Region and Western Pacific Region. Of the 11 countries in South East Asia region, 10 are endemic for dengue and this includes India too. In India, unplanned urbanisation, migration of people from rural to urban areas with lack of proper sanitation are the main factors resulting in increased burden of dengue in recent times.[4]

Over the past 50 years global incidence of dengue has increased 30 times.[5] In the past 2 decades, there has been a global increase in the frequency of dengue fever, dengue haemorrhagic fever and its epidemic due to rapid human population growth, uncontrolled urbanisation, inadequate waste and water management, and lack of effective mosquito control.[6] About 85% of dengue infections are asymptomatic and rest 15% evolve to febrile illness, about 50,000 dengue cases progress to life-threatening disease causing 20,000 to 25,000 deaths annually.[7] The acute illness experienced by dengue patients even though of short duration and not always life-threatening could have an important impact on daily activities, social function and emotional well-being.[8]

In India, the disease is now epidemic in the entire country. As per the national programme, a total of 74,201 cases of dengue and 167 deaths in 2013 were reported. In 2015, Delhi, India, recorded its worst outbreak since 2006 with over 15,000 cases. The magnitude of the problem is much high, as the estimates are only on the reported cases.[9,10]

According to National Vector-Borne Disease Control Programme, total dengue cases in India were 1,29,166 in 2016 and 1,57,220 in 2017. Total deaths in India were 245 and 250 in 2016 and 2017 respectively. In Andhra Pradesh, total cases were 3,417 in 2016 and 4,776 in 2017.

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The present study has been done with an objective to determine the clinical profile among patients diagnosed with dengue fever and to assess the radiological findings, haematological and biochemical parameters from a tertiary care hospital.

MATERIALS AND METHODS

Study Design
Hospital-based cross-sectional study.

Study Setting
Rajiv Gandhi Institute of Medical Sciences, Ongole.

Study Period
January 2016 to December 2017.

Study Subjects
Include all adult patients aged 14 years and above who were admitted in medical wards of the Department of Medicine.

Inclusion Criteria
Clinically diagnosed cases of Dengue with subsequent confirmation by Dengue NS1 Ag/ Dengue IgM.

Sample Size and Sampling Technique
A total of 233 patients were selected for the study by consecutive sampling technique.

Study Procedure
The patients were selected as per inclusion criteria. An informed consent was taken. Detailed case history was taken, and relevant investigations were done for all patients at the time of admission itself.

Data was collected using a semi-structured questionnaire, either by direct interview with patients or patient’s relatives and by clinical examination and from relevant investigations.

Investigations
a. Complete haemogram.
   b. Biochemical parameters including liver function test, renal function test, serum amylase, urine routine examination.
   c. Serology- Dengue NS1 Ag and IgM ELISA dengue.
   d. Radiological investigations- Chest x-ray, USG abdomen, ECG, ECHO scan. Neuroimaging (CT/ MRI Brain) done in selected patients only.

Statistical Analysis
Statistical analysis was done using Microsoft Excel 2010 version. Descriptive statistics was carried out by mean and standard deviation for quantitative variables, frequency and proportion for categorical variables.

RESULTS

Majority of the subjects were admitted in the month of October (53.2%) followed by November (24.9%), September (13.7%) and December (6%).

The duration of admission ranged from 1 to 22 days with mean duration of $6.44 \pm 2.87$ days with maximum proportion of patients admitted for less than 10 days.

Fever was the most common presenting symptom (99.6%) in the present study followed by myalgia in 60%, headache in 43.8%, joint pain in 35.6% and backache in 28.8%. Other symptoms in decreasing order are vomiting in 27%, retro-orbital pain in 16%, pruritus in 14%, abdominal pain in 10.3%, cough in 8.6%, loose stool in 6.9%, rash in 6% and dysuria in 5% patients.

Among bleeding manifestations, menorrhagia (4%) was the most common followed by melena in 2.1%, epistaxis in 1.3% and haematemesis in 0.9% of the study population.

Table 1. Summary of the Laboratory Parameters

<table>
<thead>
<tr>
<th>Categories</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaemia</td>
<td>54</td>
<td>23.2%</td>
</tr>
<tr>
<td>Low total leukocyte count</td>
<td>121</td>
<td>51.9%</td>
</tr>
<tr>
<td>Low platelet count</td>
<td>159</td>
<td>68.2%</td>
</tr>
<tr>
<td>High urea</td>
<td>04</td>
<td>1.7%</td>
</tr>
<tr>
<td>High creatinine</td>
<td>15</td>
<td>6.4%</td>
</tr>
<tr>
<td>Urine albumin +ve</td>
<td>08</td>
<td>3.4%</td>
</tr>
<tr>
<td>High SGPT</td>
<td>152</td>
<td>65.2%</td>
</tr>
<tr>
<td>Low S. albumin</td>
<td>77</td>
<td>33%</td>
</tr>
<tr>
<td>High SGOT</td>
<td>172</td>
<td>73.7%</td>
</tr>
<tr>
<td>High S. amylase</td>
<td>17</td>
<td>7.3%</td>
</tr>
<tr>
<td>High RBS</td>
<td>39</td>
<td>16.7%</td>
</tr>
</tbody>
</table>

Figure 1. Bar Chart of Serology in Study Group

Anaemia was seen in 23.2% of dengue fever patients in the study. Majority (51.9%) had TLC less than 4000. Majority had low platelet count (68.2%). Out of the 233 cases of dengue fever, 13.7% patients had a platelet count less than 29,000.

Blood urea and serum creatinine were high in 1.7% and 6.4% of the patients respectively.

Among the Liver function tests SGPT was altered in 65.2%, serum albumin in 33%, SGOT in 73.7% of the patients. 16.7% of patients had high random blood sugar level and 7.3% had high serum amylase levels.

Dengue NS1 antigen was positive in 187 (80.3%) of patients and 50 (21.5%) had dengue IgM positivity.
Almost all patients in the study presented with fever. Other than fever, myalgia was the most common symptom in 60.9% followed by headache (43.8%), joint pain (35.6%), backache (28.8%), vomiting (27%), retro-orbital pain (1%), pruritus (14%), abdominal pain (10.3%), cough (8.6%), loose stool (6.9%), rash (6%) and dysuria (5%). Similar findings were seen in other studies - Mohan D Kashinkunti[11] study, Rachal study,[12] Singh R study[15] and Ashwini Kumar study.[17]

The bleeding manifestations constituted 10% of the present study, whereas 15.2% of cases in Rachal study,[12] 21% in Mohan D study[11] and 11.4% in Singh R study.[15]

In present study patients with platelet counts > 1,50,000/cumm in 31.3%, 32.2% in 90,000 - 1,50,000/cumm, 15% in 60,000 - 89,000, 7.7% in 30,000 - 59,000/cumm, 13.7% in < 29,000/cumm.

The results of Singh R study[15] is similar to present study.

The result of Patel PM study[14] and Singh R study[15] are similar to that of the present study.

Sinus bradycardia as an ECG finding constituted 25% cases in present study, whereas 15% in Rachal study.[12]

CONCLUSION

Strong possibility of dengue fever should be kept in mind in any patient presenting with fever, myalgia, joint pain, headache and backache. Ultrasonographic features like Gall bladder wall oedema, pleural effusion and ascites should strongly favour diagnosis of dengue fever in a patient who

<table>
<thead>
<tr>
<th>Categories</th>
<th>Number</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>ECG Sinus Bradycardia</td>
<td>56</td>
<td>24%</td>
</tr>
<tr>
<td>Chest X-ray</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Left lower lobe consolidation</td>
<td>06</td>
<td>2.6%</td>
</tr>
<tr>
<td>Pleural effusion</td>
<td>06</td>
<td>2.6%</td>
</tr>
<tr>
<td>Echocardiogram</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pericardial effusion</td>
<td>03</td>
<td>1.3%</td>
</tr>
<tr>
<td>Other Radiological Findings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gall bladder oedema</td>
<td>48</td>
<td>19.3%</td>
</tr>
<tr>
<td>Ascites</td>
<td>22</td>
<td>9.4%</td>
</tr>
<tr>
<td>Pleural effusion</td>
<td>22</td>
<td>9.4%</td>
</tr>
<tr>
<td>Free fluid Morrison pouch/ pelvis</td>
<td>06</td>
<td>2.6%</td>
</tr>
<tr>
<td>Pancreatitis</td>
<td>06</td>
<td>2.6%</td>
</tr>
</tbody>
</table>

**Table 2. Radiological and Other Investigations**

In the present study, sinus bradycardia as an ECG finding was seen in 24% cases. Chest x-ray was normal in 221 (94.8%) patients, 6 (2.6%) patients each had left lower lobe consolidation and pleural effusion. Pericardial effusion on echocardiogram was seen in 1.3% patients.

The most common radiological finding in the present study was gall bladder wall oedema which constituted 19.3% cases followed by ascites (9.4%), pleural effusion (9.5%), free fluid in Morrison pouch/ pelvis (2.6%) and pancreatitis (2.6%).

**DISCUSSION**

In the present study of 233 patients of dengue fever, males were affected more than females. 121 were males and 112 were females, which constitute to 51.9% and 48.1% respectively and the ratio being 1.08: 1.

<table>
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</thead>
<tbody>
<tr>
<td>SGPT</td>
<td>65.2%</td>
<td>40%</td>
<td>-</td>
<td>41.4%</td>
<td>64%</td>
</tr>
<tr>
<td>SGOT</td>
<td>73.7%</td>
<td>-</td>
<td>83.9%</td>
<td>80%</td>
<td>64%</td>
</tr>
<tr>
<td>S. albumin</td>
<td>33.05%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Table 5. Comparison of Platelet Count in Present Study with Other Studies**

The results of Patel PM study[14] and Singh R study[15] are similar to that of the present study.

**Table 3. In Study of Dengue Fever Male-to-Female Ratio in Different Studies**

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Gall bladder wall oedema</td>
<td>19.3%</td>
<td>66.7%</td>
<td>100%</td>
<td>12.9%</td>
<td>92.8%</td>
</tr>
<tr>
<td>Ascites</td>
<td>9.4%</td>
<td>64.5%</td>
<td>-</td>
<td>38.6%</td>
<td>93.3%</td>
</tr>
<tr>
<td>Pleural effusion</td>
<td>9.4%</td>
<td>48%</td>
<td>6.25%</td>
<td>12.9%</td>
<td>29.5%</td>
</tr>
<tr>
<td>Hepatosplenomegaly</td>
<td>-</td>
<td>17%</td>
<td>21.8%</td>
<td>43.6%</td>
<td>66%</td>
</tr>
<tr>
<td>Splenomegaly</td>
<td>-</td>
<td>16%</td>
<td>6.25%</td>
<td>30%</td>
<td>50%</td>
</tr>
<tr>
<td>Pancreatitis</td>
<td>2.6%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Free fluid in pelvis</td>
<td>2.6%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Table 6. Comparison of Ultrasound Findings in Present Study with Other Studies**

The maximum prevalence of dengue fever was noted in age group of 40 - 59 yrs. of about 44.6%. The least number were in > 80 years' age group with 1.3% accounting for it.

The duration of admission ranged from 1 to 22 days with mean duration of 6.44 ± 2.87 days.

The maximum number of patients got admitted in October (53.2%) followed by November (24.9%), September (13.7%), December (6%) in the present study, whereas the maximum number of admissions are in September (27.3%) in Singh R study[15] followed by October (25%), November (20%) and August (19%).

**Table 4. Comparison of Ultrasound Finding in Different Studies**
presents with fever and thrombocytopenia, especially during an epidemic. It helps in making the diagnosis of dengue fever in patients awaiting their serological reports.

REFERENCES