A Study of Hepatic Dysfunction in Dengue
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Abstract
Dengue is a major international health concern that is prevalent in tropical and subtropical countries. There are certain clinical features that are associated with Dengue in addition to the classical features. An analysis of 70 patients suffering from dengue showed liver dysfunction was present in all patients. Vomiting was an important symptom. SGOT levels were higher than SGPT levels. Hepatosplenuemegaly and ascitis were also present in significant number of patients.

One should be aware of these presentations when dealing with suspected cases of Dengue.

Introduction
Dengue infection is a major health problem worldwide including our country. Globally the incidence of dengue has grown dramatically in the recent years. The WHO estimates that presently about two fifths of the world population is at risk for this viral infection.1 Every year during the monsoon months and later, many parts of the country witness outbreaks of dengue infection. 2010 was no exception and we experienced an outbreak of this vector borne disease in Lucknow. An analysis of these patients revealed that in addition to the classical features of fever, body ache, rash, thrombocytopenia and bleeding tendency, there were other features such as liver dysfunction including a preferential rise of SGOT, hepatosplenuemegaly, ascitis, pleural effusion and leucopenia.

Materials and Methods
A total of 70 patients were studied. These were patients who were admitted to Medicine wards at Era’s Lucknow Medical College from August to November 2010. Only those patients were included in the study who had classical features of dengue - fever with chills, body ache, headache, rash, bleeding manifestations and thrombocytopenia and had a positive ELISA test i.e. IgM antibodies against dengue virus. Patients who had malaria and enteric fever were excluded from the study. All patients were subjected to a detailed history and a thorough clinical examination. A complete blood count, liver function tests, renal function tests, chest X-ray and USG abdomen were also done.

Results
Of the 70 patients studied, 52 were males and 18 females. The age range of patients was 15-59 years and the mean age was 28 years.

All patients had fever as presenting complaint. 83% patients had body ache while 80% had vomiting. 27% patients had bleeding tendency with upper GI bleed being the commonest presentation.

The average platelet count of our patients was 35,000. The average serum bilirubin level was 0.9±0.6mg/dL. The average SGPT levels were 133±214units/L while average SGOT levels were 267±460units/L. The mean alkaline phosphatase levels were 89±80units/L. 100% patients had an elevated SGOT level while 91% patients had elevated SGPT level. There were 85% patients who had their SGOT level> 2 xULN, while 48% patients had SGPT levels>2 x ULN. In patients who had raised levels of both enzymes, the SGOT levels were 2-3 times higher than SGPT levels (Table 1 and 2).

50% patients had hepatomegaly or hepatosplenuemegaly. 36 patients had hepatomegaly on ultrasonography and 27 of them had liver enlargement clinically as well. 15 patients had splenomegaly on USG of which only 3 had spleen enlargement clinically.

42 patients had evidence of ascitis on ultrasonography. Only 5 patients out these 42 had clinically detectable ascitis. Ascitis in all patients was minimal to mild. 15% patients had evidence of pleural effusion on USG/X-ray. 10% patients had evidence of leucopenia.

Discussion
The results of the present study show certain unusual manifestations of dengue.

There was a universal involvement of liver in our patients as evidenced by elevated levels of SGOT in all patients. Involvement of liver in dengue has been described in textbooks as an elevation...
of transaminases. Liver involvement in dengue has also been reported in children. In adults there are few studies that report elevated enzyme levels, ascites and hepatomegaly. Our study showed a higher SGOT levels in comparison to SGPT. This reversal is known to occur in alcoholic liver disease. There is one study where this reversal was seen in malaria and enteric fever. Our findings are different from that of Srivenu Itha et al who found no preferential elevation of enzymes.

Apart from the fact that SGOT levels were raised in all patients, nearly 85% patients had SGOT levels more than twice the upper limit of normal. Although most patients presented after 3-4 days of fever, in those who came early, there was a rise of SGOT levels on day two and three itself. The presence of vomiting in 80% patients from day one may indicate hepatic dysfunction early on.

50% of our patients had hepatomegaly with or without splenomegaly. Studies of liver involvement in children report a higher percentage of patients presenting with hepatomegaly, as high as 80-100%. There are few reports of spleen enlargement in dengue infection. The mechanism of liver involvement in dengue infection is not clear and may involve a direct injury to liver cells or an immunological response. None of our patients had dengue shock syndrome and therefore shock as a cause of liver injury is ruled out.

Ascitis was present in nearly 60% patients. This is an unusual finding in dengue. Ascitis in our patients was mild and detected usually on ultrasonography. Ascitis in dengue has been attributed to plasma leakage. However there is one study which attributes portal hypertension in addition to plasma leakage for development of ascitis. In our patients as the ascitis was mild and fluid was not aspirated, the serum ascitis albumin gradient could not be calculated.

10% of our patients had leucopenia. Leucopenia has been reported in dengue and has been attributed to transient marrow suppression by the virus.

It is important to keep these features in mind particularly considering the fact that diagnosis of dengue may be difficult in some cases and ELISA for dengue may not be positive in first few days of infection. We need a prospective study to see for liver enzymes within 24-48 hours of onset of fever and also to see whether SGOT levels are higher than SGPT levels.

### Table 2: Comparison of certain characteristics in dengue hemorrhagic fever and dengue fever

<table>
<thead>
<tr>
<th>S. No.</th>
<th>DHF(n=22)</th>
<th>DF(n=48)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Av. Platelet (per mm3)</td>
<td>29,000±23000</td>
<td>36,000±25000</td>
</tr>
<tr>
<td>2</td>
<td>Av. Serum Bilirubin (in mg%)</td>
<td>0.88±0.38</td>
<td>1.01±0.79</td>
</tr>
<tr>
<td>3</td>
<td>SGPT (in units/L)</td>
<td>138±206</td>
<td>132±219</td>
</tr>
<tr>
<td>4</td>
<td>SGOT (in units/L)</td>
<td>239±295</td>
<td>283±541</td>
</tr>
<tr>
<td>5</td>
<td>Alk. Phosphatase (in units/L)</td>
<td>76.6±33</td>
<td>94±93</td>
</tr>
<tr>
<td>6</td>
<td>Hepatosplenomegaly</td>
<td>4/22(20%)</td>
<td>15/48(31%)</td>
</tr>
<tr>
<td>7</td>
<td>Leucopenia</td>
<td>2/22(10%)</td>
<td>4/48(8.3%)</td>
</tr>
</tbody>
</table>

Values showing mean±std deviation or n(%)

Conclusion

The present study shows that there are certain features of dengue that are not known to be usually associated with it. The presence of raised liver enzymes in all patients, ascitis, hepatosplenomegaly, elevation of SGOT more than SGPT, should be kept in mind when evaluating patients with suspected dengue.

### References