

## Case Report

# Dengue and HEV co-infection in a case of hepatitis

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### ABSTRACT

A 35 years old male presented in the casualty of D.Y. Patil hospital with chief complaints of fever with chills since 10 days. Due to high endemicity of malaria in the Navi Mumbai region an initial diagnosis of malaria was made. Patient was admitted and started on anti-malarials. Initial reports were positive for dengue NS1 antigen. As the patient had severe jaundice a possibility of another co-infection was considered. On further investigation hepatitis E (HEV) Ig M was positive. This case illustrates the importance of considering co-infections in endemic areas that can pose diagnostic dilemmas.

**Keywords:** Dengue, Hepatitis, HEV, ALT, AST, Co-infection

### INTRODUCTION

Dengue including DHF and DSS is a growing major mosquito borne disease of immense public health importance in India as in many other countries of the world. The causative agent for dengue is the dengue virus (DENV) which belongs to genus *Flavivirus* of the family *Flaviviridae*. Dengue fever and dengue hemorrhagic fever (DHF) are caused by four antigenically related dengue viruses. The vector for dengue infection is most commonly *Aedes aegypti* and in few cases *A. albopictus*.<sup>1</sup> Infection with any of the four serotypes of DENV causes a mild, self-limiting febrile illness referred to as break-bone fever. Diagnosis is confirmed by isolating the virus from the serum during the febrile phase of the illness. The specificity of NS-1 assay is very high 98%-100% and thus is useful for early detection within the first five days.

Hepatitis E virus infection is most common cause of acute sporadic and epidemic viral hepatitis in India. It is transmitted via the faeco-oral route. Clinical manifestation of HEV infection ranges from

asymptomatic to icteric hepatitis to fulminant hepatic failure.<sup>1</sup> ELISA is available for detection of Ig M antibodies against HEV and is specific for recent or on-going infection.

### CASE REPORT

A 35 years old male presented with chief complaints of high grade fever with chills since 10 days. Fever was associated with nausea and vomiting since the last 2 days.

There was no history of burning micturition, cough, sore throat, pain in abdomen, yellowish discoloration of skin, any bleeding tendency.

On examination all vitals were stable. Patient had mild to moderate icterus.

On palpation of the abdomen the liver was enlarged 2 cm below the coastal margin.

Due to high endemicity of malaria and dengue in the Navi Mumbai area during the monsoons an initial

diagnosis of malaria was made. Patient was admitted and started on anti-malarials. Peripheral smear for malarial parasites as well as malarial antigen test were negative and hence the antimalarial were stopped. Initial investigations revealed thrombocytopenia, leukopenia and raised haematocrit. Dengue NS1 antigen was positive and hence the diagnosis of dengue was made.

**Initial reports**

CBC  
 Haemoglobin: 15.2 gm/dl  
 TLC: 3.6  
 Platelets: 113  
 PCV: 47.7  
 MCV: 84.6  
 Peripheral smear for MP: Negative  
 Malarial antigen test: Negative  
 Dengue NS1: Positive  
 Lepto Ig: Negative  
 S. Creatinine: 0.6  
 Liver profile  
 Total bilirubin: 10.2  
 Direct bilirubin: 5.4  
 Indirect bilirubin: 4.8  
 Total protein: 7.6  
 Albumin: 4.5  
 AST: 386  
 ALT: 334  
 ALP: 228  
 PT: 17.7  
 INR: 1.6

As the jaundice was disproportionate to that generally seen in dengue hepatitis, the possibility of a co-infection was considered hence HbsAg, Anti HCV antibodies, HAV IgM and HEV IgM were sent.

HbsAg: Negative  
 Anti HCV: Negative  
 HAV IgM: 0.52 index (<0.80-negative)  
 HEV IgM: 8.93 (>1.1-positive)

Thus the diagnosis of dengue with hepatitis E co-infection was made.

**DISCUSSION**

Malaria and dengue are rampant in the Navi Mumbai area. Any patient of acute febrile illness with thrombocytopenia can be empirically started on antimalarial. There are several overlapping clinical features of malaria, dengue and viral hepatitis, which make it difficult to reach to a diagnosis especially in a resource limited setup. All the three above mentioned infections are known to cause liver involvement.

The involvement of liver in dengue fever is not uncommon as reported in literature since 1970.<sup>3</sup> In the Liver function tests (LFT) most common abnormality seen is elevated transaminases which are involved in amino acid metabolism. In approximately 90% of the patients with DF, aspartate aminotransferase (AST) is higher than the alanine aminotransferase (ALT).<sup>4,5</sup> Jaundice and acute liver failure are rarely seen in dengue fever. Liver involvement in dengue can occur due to direct effect of the virus or host immune response on liver cells; circulatory compromise caused by hypotension or localized vascular leakage inside the liver capsule and tissue tropism of particular viral serotypes or genotypes.<sup>6</sup> Biopsy specimens obtained from a small number of patients with DSS who died have shown a variety of patterns including micro vesicular steatosis, hepatocellular necrosis with associated councilman bodies, Kupffer cell destruction, and inflammatory infiltrates at the hepatic portal tracts.<sup>7,8</sup>

If the liver functions are deranged out of proportion to that seen in dengue infection and there is associated hyperbilirubinemia the possibility of co-infection should be considered.

Occurrence of co-infections in immunocompetent hosts is rare. Dengue and hepatitis E have different modes of transmission making the chances of co-infection even rarer. Under diagnosis of such cases is very likely due to the overlapping clinical spectrum. This case highlights the presence of co-infections that are not transmitted via the same route. Hence the physician needs to be aware of such co-infection.

**Table 1: Serial CBC's during the course of hospitalization.**

	Day 1	Day 3	Day 5	Day 6	Day 7	Day 8
Haemoglobin	14.9	13.7	15.2	15.1	15.2	14.3
TLC	4.5	3.2	5.9	4.9	4.6	5.1
Platelets	109	85	76	36	41	62
PCV	47.7	40.2	47.7	43.7	45.9	44.6
MCV	84.6	83.7	83.4	83	84	83.7

**Table 2: Serial liver profile's during the stay in hospital.**

	Day 1	Day 3	Day 5	Day 7	Day 9
Total bilirubin	10.2	9.9	9.5	5.6	3.2
Direct/Indirect bilirubin	5.4/4.8	6.6/3.9	6.5/3.3	3.8/1.8	2.0/1.2
Total protein/albumin	7.6/4.5	7.2/3.6	7.3/3.7	7.5/3.9	7.7/4.3
AST	386	996.1	463.5	200.8	122.6
ALT	334	1262	924.1	529.7	289.8
ALP	228	176	186.6	196.4	114

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