

# Concurrent Infection with Malaria, Dengue and Hepatitis A Virus together

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## Abstract

Dengue, Malaria and Hepatitis-A infection are endemic in developing countries and are associated with poor sanitation and low socioeconomic status. Their coexistence can present a diagnostic dilemma to the treating physician. Though there have been few case reports of concurrent mixed infection but there have been no case reports for Dengue, Malaria and Hepatitis-A together. Here, I present a case of a young female with a recent history of travel all around the country tested positive for the Dengue, Malaria and Hepatitis-A virus. There are several overlapping clinical features of Dengue, Malaria, and Hepatitis-A, which can cause substantial misdiagnosis.

**Keywords:** Malaria; Dengue; Hepatitis A

## Introduction

There have been many case reports in the literature about the mixed infection but so far there have been no case reports of Dengue, Malaria and Hepatitis-A infection together. This case is unique because here mode of transmission of different diseases is entirely different yet the patient presented at the same time and diagnosed having mixed infection.

## Case Report

A 25 year old immunocompetent female resident of Mumbai, was travelling around the country since last 2 weeks presented with complaints of fever, chills, nausea, myalgia and headache since last 2 days following her return from travel. On examination her liver was tender with a span of 6 cm and the spleen was just palpable. Other systemic examinations like cardiovascular, respiratory and central nervous system were within normal limits. Her vital parameters were within normal limits except mild fever around 100 degree F and tachycardia of around 95/min. She didn't have any clubbing, cyanosis, enlarged lymph nodes, or pallor at presentation. She had mild icterus on clinical examination. The differential diagnoses at this point as outdoor patient considered were malaria, typhoid fever, dengue fever, acute hepatitis and leptospirosis. Investigations done as outdoor patient revealed: hemoglobin 12.30 gm/dL, total leukocyte count 3600/mm<sup>3</sup>, and platelet count 135000/mm<sup>3</sup>. Peripheral blood smear done as outdoor patient was negative for malarial parasite and serological tests for dengue were negative initially. But she continued to have symptoms with severe weakness and persistent nausea and vomiting so she was admitted in the hospital for further management. Complete blood counts during the course in hospital are shown in Table 1.

On admission all the relevant investigations were sent including repeat malaria smear, malaria antigen and serology for dengue fever. Her repeat malaria smear test came negative but malaria antigen came positive for *Plasmodium vivax*. Next day her Dengue Ns1 and IgM both turned positive. Serum electrolytes, blood culture, urine culture and renal function tests were within normal limits. Liver function showed elevated bilirubin with elevated liver enzymes. Widal test and leptospirosis serology were negative. Ultrasonography abdomen revealed pseudo thickening of gall bladder with mild enlargement of the liver. Coagulation parameters were within normal limits. Liver function tests during the course in hospital are shown in Table 2.

Highly elevated liver enzymes alerted the possibility of coexistent viral hepatitis. Serological test for viral hepatitis were sent and found

positive for HAV-IgM and negative for hepatitis B, C, and E viruses. She was put on Injection Artesunate as per the WHO guidelines. Intravenous fluids and antipyretics were started. As the general condition of the patient was improving and all the cultures were negative, supportive treatment was continued. She was also started on Tablet Primaquine for the prophylaxis of malaria after Injection Artesunate course got over. She finally became afebrile on the 7th day and was discharged on the 10th day of admission. Her repeated liver function and platelet counts showed steady recovery. She was well on follow-up after 15 days with near normal liver enzymes.

## Discussion

Concurrent infection with different infective agents leads to an overlap of their clinical features that can pose a diagnostic dilemma to the treating physician, especially in endemic areas. There are many features which overlap when patient presents with acute febrile illness like high fever, myalgia, headache, nausea and weakness. Recent studies has shown that confection with different agents may be more severe. [1]. Earlier there have been case reports of dengue virus with a *flavivirus*, *chikungunya* [2] and with different bacteria including *salmonella typhi* [3], *shigella sonnei* [4], and *leptospira spp.* [5].

Existence of simultaneous, multiple infections in an individual has been reported in the literature. Yakoob, et al [8] has reported a case of dengue with hepatitis A and E while Behera et al. [3] has reported a case

CBC	Day1	Day2	Day3	Day4	Day5	Day7	Day9	Day15
Hb (gm/dl)	11.6	9.8	9.70	9.10	8.30	7.9	8.40	9.90
Hct (%)	35.6	30.0	29.60	27.40	25.70	24.3	25.70T	30.70
WBC (/cumm)	3300	6200	7100	8200	12300	10000	9300	9300
Platlets (Thousand/cumm)	105	87	95	94	160	236	259	506

Table 1: Complete blood counts during the course in hospital

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LFT	Day1	Day3	Day5	Day7	Day9	Day15
Total Bilirubin	4.01	5.69	8.50	6.32	4.32	2.29
Conjunction Bilirubin	1.50	3.11	5.14	2.96	0.37	0.00
Unconjunction Bilirubin	1.30	1.32	1.54	1.03	0.85	0.44
Delta Bilirubin	1.21	1.26	1.82	2.33	3.10	1.85
Total Protein	7.12	6.12	6.24	6.11	7.64	8.63
Albumin	3.88	2.97	2.81	2.54	3.15	3.86
Globulin	3.24	3.15	3.43	3.57	4.49	4.77
A/G Ratio	1.20	0.94	0.82	0.71	0.70	0.81
AST(SGOT)	6989	3185	605	259	245	95
ALT(SGPT)	5983	3943	1713	881	665	266
ALP	127	137	288	734	935	524
GGT	186	193	634	1621	2178	1318

Table 2: Liver function tests during the course in hospital

of Leptospirosis, dengue and hepatitis E. Dengue infection with Malaria [9], typhoid [10] and leptospirosis [11] has been reported in the past in the literature. Malaria has also been reported to be associated with Leptospirosis [12] and Hepatitis A [13]. Mishra et al. [14] has reported a case of typhoid fever with viral hepatitis.

Both dengue fever and viral hepatitis can present with fever and jaundice. Although hepatic involvement is commonly seen with dengue fever, severe hepatic derangement is rare. Presentation of hepatitis A infection is similar, but with a few differences: Fever usually subsides with the appearance of jaundice and the period between onset of fever and jaundice is 1-7 days [9]. Serum aminotransferase levels are markedly elevated in viral hepatitis (8-10 times normal) as compared with those in dengue fever in which they are elevated 2-3 times the normal value. [9]. In dengue fever, aspartate aminotransferase has been found to increase more quickly and peaking at a higher level and then reverting to normal sooner than alanine aminotransferase. [10] This pattern is different from that commonly seen during acute hepatitis caused by hepatitis viruses. Other differentiating features of dengue fever include hemo concentration, thrombocytopenia, and third space fluid losses [14]. The coagulation profile is usually normal in patients with dengue fever [11]. Hence an abnormal coagulation profile should alert one to an underlying infection with a hepatotropic virus or disseminated intravascular coagulation associated with sepsis. Usually in dengue fever without complications the fever spikes comes down by day 4-5 of illness. However, fever may be prolonged in patients having mixed infections as seen in our case. Highly elevated liver enzymes and prolonged fever in the patient alerted us to the possibility of coexistent viral hepatitis.

To the best of my knowledge there have been no case report of a case like mine where malaria, dengue and hepatitis A were existing together same time and with common presentation. Peculiarity of this case is that there are different vectors and different mode of transmission of these diseases but still presented together in a single patient at the same time. According to Carme et al. [13] in French Guiana the specific rate of concurrent malaria and dengue infection from overall febrile patients was equal to 0.99. Malaria and dengue are difficult to differentiate clinically as is emphasized by this case, yet the treatment of the illnesses is different and delay in appropriate therapy can be devastating, especially in malaria [15]. Endemic areas of malaria, dengue and hepatitis A overlap to a large excellent in south east Asia and acquisition of both mosquito and airborne infection though uncommon but possible as in this case.

I suggest that such concurrent infection should always be kept in

mind by the physician while encountering such clinical situations as such mixed infections are likely to occur more frequently than reported in there available literature.

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