



**ORIGINAL RESEARCH PAPER**

**Paediatrics**

**DENGUE WITH CONCURRENT HEPATITIS A CAUSING DIAGNOSTIC DILEMMA - CASE SERIES**

**KEY WORDS:** Dengue, Hepatitis A, Confection

<b>Vinit Rathod</b>	Postgraduate Student , Dept Of Paediatrics ,PCMC,s Postgraduate Institute, YCM Hospital, Pimpri, Pune-Maharashtra, India
<b>Mahendra Bhakal</b>	Postgraduate Student, Dept Of Paediatrics ,PCMC,s Postgraduate Institute, YCM Hospital, Pimpri, Pune-Maharashtra, India
<b>Amit Rathod</b>	Assistant Professor, Dept Of Paediatrics ,PCMC,s Postgraduate Institute, YCM Hospital, Pimpri, Pune-Maharashtra, India
<b>Deepali Ambike*</b>	Professor , Dept Of Paediatrics ,PCMC,s Postgraduate Institute, YCM Hospital, Pimpri, Pune-Maharashtra, India *Corresponding Author
<b>Rajesh Kulkarni</b>	Associate Professor , Dept Of Paediatrics ,PCMC,s Postgraduate Institute, YCM Hospital, Pimpri, Pune-Maharashtra, India
<b>Sandhya Haribhakta</b>	Associate Professor , Dept Of Paediatrics ,PCMC,s Postgraduate Institute, YCM Hospital, Pimpri, Pune-Maharashtra, India

**ABSTRACT**

Dengue and viral hepatitis A are extensively endemic diseases in India. Coinfection of these infections is uncommon and poses difficulty for physicians to diagnose as their clinical features are quite similar and overlapping. This article presents with 8 paediatric age group cases reporting Dengue fever which occurred concomitantly with Hepatitis A virus infection. Usually these infections are self-limiting but complications of coinfection are described in this article.

**INTRODUCTION:**

Dengue is the most extensively spread mosquito-borne disease, transmitted by infected mosquitoes of *Aedes* species. Dengue infection in humans results from four dengue virus serotypes (DEN-1, DEN-2, DEN-3, and DEN-4) of *Flavivirus* genus. Dengue fever is endemic in more than 100 countries with most cases reported from the Americas, South-East Asia and Western Pacific regions of WHO. (1) In India, dengue is endemic in almost all states and is the leading cause of hospitalization.

Hepatitis A is an acute inflammation of the liver, caused by infection with hepatitis A virus (HAV). The disease is usually self-limiting. Hepatitis A virus (HAV) and hepatitis E virus (HEV), are hyperendemic in India. Hepatitis is most common type of viral hepatitis. HAV is the sole member of genus Hepatovirus, which is placed in family Picornaviridae. It is transmitted via faecal-oral route.

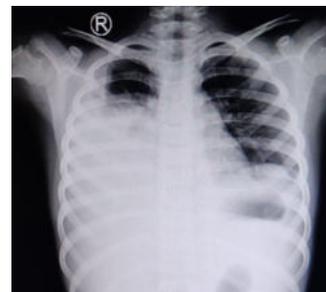
Dengue, leptospirosis, malaria, and viral hepatitis, have many overlapping clinical symptoms making it difficult to diagnose them together. A series of case reports have been published on various coinfections with dengue in an individual. Coinfection of dengue with leptospira, malaria, hepatitis A, hepatitis E and typhoid fever have been reported in literature(2,3)

Coinfection with dengue and hepatitis A in an individual is rare but challenging for medical professionals because of the overlap between their symptoms (4,5). Moreover, bacteraemia in a patient co-infected with dengue and hepatitis A is extremely rare and more challenging in terms of diagnosis and management, posing life-threatening complications. Coinfection with dengue is frequently caused by bacteria, followed by viruses (6). There are several case reports on bacterial infections causing complications in patients with dengue (7,8). For instance, dengue can be complicated by *Staphylococcus aureus* causing pneumonia and abscess (2,9) . Additionally, staphylococcal endocarditis following classic and haemorrhagic dengue fever was also reported (10,11).

Although both infections are common in the population occurring as isolated infections, coinfection is rare. Coinfection with dengue and hepatitis A is rare and challenging for physicians since their clinical features can be overlapping. These infections are self-limiting but can become complicated by multiple complications.

Case 1:- 8 years old male child, came with high grade fever since 7 days and non-projectile vomiting and abdominal pain and body-ache since 1 day. On examination mild hepatomegaly+, icterus present. Ultrasonography was done was suggestive of mild ascites. On lab investigation suggestive of thrombocytopenia with raised liver enzymes.

Case 2: 8 years old male child admitted with complaint of vomiting (non-projectile), abdominal pain, high grade fever, decreased oral intake and headache since 7 days . On examination child was febrile, conscious oriented, icterus +, hepatomegaly present, no splenomegaly with mild ascites. Lab investigations suggestive of thrombocytopenia, raised liver enzymes, raised bilirubin. X-ray chest suggestive of right sided pleural effusion. Pleural tap was done and came out to be transudative collection



Case 3:- 11 years female child admitted with complaints of high grade fever, non-projectile vomiting and yellowish discoloration of eye since 5 days. On examination child was conscious, oriented with icterus+, no hepatomegaly, no splenomegaly. Ultrasonography s/o mild ascites and pseudo-gall bladder wall edema

Case 4:-11 years male child admitted with complaints of high grade fever since 4-5 days and body-ache, multiple joint pain, nausea and vomiting, abdominal pain in right hypochondrium and generalized weakness since 2 days. On examination child was febrile, vitals stable, no pallor, icterus +, no lymphadenopathy.

Case 5:-8 years female child admitted with complaints of high grade fever since 15 days, history of dark colored urine since 10 days, decreased oral intake since 5 days, yellowish discoloration of eyes since 3 days, no history of vomiting, abdominal pain, loose motion. On examination child was febrile, vitals stable, icterus present, no pallor, edema, lymphadenopathy or cyanosis. Lab investigations were indicating thrombocytopenia, increased hematocrit. Ultrasonography suggestive of mild hepatomegaly, mild ascites, mild cystitis.

Case 6:- 6 years old male child was admitted with complaints of high grade fever since 10 days, pain in abdomen, non-projectile vomiting, generalized weakness, yellowish discoloration since 6 days. On examination child had icterus+, pallor+. No signs of hepatic encephalopathy. Ultrasonography done indicated hepatomegaly with right sided moderate and left sided minimal pleural effusion along with mild ascites.



Case 7:- 9 months old admitted with complaints high grade fever and cough cold since 3 days, drowsiness since 2 days. On examination child has icterus +. Labs findings were having slightly increased ammonia with deranged liver enzymes. Ultrasonography was done suggestive of hepatomegaly with moderate ascites and bilateral pleural effusion.



Case 8: 4 year old male child admitted in view of yellowish discoloration of eyes since last 8 days. Mother gives history of decreased oral intake and vomiting since last 7 days and fever on and off since last 7 days with high grade fever since last 3 days. He also complains of abdominal pain since 3 days

Investigations	CASE 1	CASE 2	CASE 3	CASE 4	CASE 5	CASE 6	CASE 7	CASE 8
Hemoglobin	12	14.5	7.9	12.6	12.1	10.9	10.7	7.7
Hematocrit	40.5	45.7	33.3	39.2	35.2	41.8	32.8	34
WBC	2910	6960	7760	4210	3020	7500	9410	1920

Platelets	73000	86000	108000	111000	159000	311000	771000	310000
CRP	1.1	10.8	3.8	1.0	1.0	6.8	2.3	1.8
Na+	137	130	132	131	138	133	145	143
K+	4.5	4.5	4.8	3.9	4.2	4.9	5.4	4.4
Cl-	110	110	98	103	110	101	107	101
Creatinine	0.4	0.6	0.6	0.5	0.6	0.5	0.6	0.4
BUN	16	13	19	26	19	18	93	17
SGPT	263	2442	507	262	114	920	1463	546
SGOT	406	951	299	564	286	1147	3604	642
BILI(T/D)	0.6/0.2	6.6/5.5	5.6/3.8	1.8/1.3	2.7/1.3	5.8/4.6	0.7/0.3	3.98/2.98
TP/ALB	6.2/3.7	5.7/2.9	7.6/3.8	6.9/4.1	6.6/3.9	5.7/4.6	3.4/2.2	7.2/3.9
Total calcium /Ionic calcium	8.6/4	8.6/4	8/4.2	8.4/4.4	8.5/3.8	8.3/4.0	7.5/4.1	8.2/4.2
AMMO NIA	90	84	110	76	95	140	181	101
Dengue								
NS1	Positive	Positive	Negative	Positive	Positive	Positive	Positive	Negative
IgM	Reactive	Non Reactive	Reactive	Reactive	Reactive	Reactive	Non Reactive	Reactive
Hepatitis A (IgM)	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive
HIV	Negative	Negative	Negative	Negative	Negative	Negative	Negative	Negative
HBsAg	Negative	Negative	Negative	Negative	Negative	Negative	Negative	Negative
HCV	Negative	Negative	Negative	Negative	Negative	Negative	Negative	Negative
PT/INR	22.9/1.9	12.6/1.03	13.1/1.09	21.8/1.8	18/1.5	11.4/0.9	24.6/2.1	10.6/0.87
APTT	30	34.8	38	42.8	29	30	88.5	40
LDH	115	180	204	130	160	290	402	204

**RESULTS:**

Our case series includes 8 patients out of which 6(75%) were males and 2(25%) were females. 2(25%) patients were below two years of age and 6(75%) were above 4 years of age. Children presented with high grade fever, mild hepatomegaly, icterus. Ultrasonography was done was suggestive of mild ascites. On investigations, suggestive of thrombocytopenia with raised liver enzymes. Also, in the investigation we found out only 2 (25%) patient with NS1 negative and 2 (25%) patients with non- reactive IgM. All the patients showed Hep A (IgM) positive. 6 (75%) patients showed raised bilirubin and 4 (50%) deranged PT/INR. 3(37.5%) patients showed pleural effusion in our study.

**DISCUSSION:**

Hepatitis A virus (HAV) causes acute hepatitis, associated with significant morbidity and occasional mortality; and sometimes with rare complications such as acalculous cholecystitis, pleural effusion and ascites (12).The pathology of ascites is thought to be venous or lymphatic obstruction due to liver involvement or reduction of oncotic pressure due to hypoalbuminemia during the course of infection. (13)

Dengue infections often present with hepatomegaly, mild-to-moderate increase in transaminase levels with hemoconcentration and third spacing due to plasma leakage; leading to ascites and pleural effusion. Presentation with jaundice can simulate acute hepatitis and that is why, it is very important to differentiate it from hepatitis A. A series of case reports have been reported regarding mortality from dengue associated with liver cell failure(14). We reported 3 case with pleural effusion and 6 cases with mild to moderate ascites.

In dengue, liver involvement can occur due to direct effect of the virus or host immune response on liver cells or localized vascular leakage inside the liver capsule and tissue tropism of particular viral serotypes or genotypes. Serum aminotransferase levels are markedly elevated in viral hepatitis (8–10 times of normal) as compared to that in dengue fever in which they are elevated 2–3 times the normal value and the ratio of aspartate aminotransferase/lactate dehydrogenase (AST/LDH) is >four in viral hepatitis(15). Marked elevation of these enzymes should raise suspicion of coexisting infection of hepatitis A with dengue. Both dengue fever and viral hepatitis can present with fever and jaundice. 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 (2)

Other differentiating features of dengue fever include deranged increased bilirubin (16). In the present cases, though the patients had third spacing in form of ascites or pleural effusion, they had either deranged increased bilirubin or deranged coagulation profile. However, since all had fever and serositis at the time of presentation, it was unlikely that hepatitis A alone was the cause of all abnormalities. An abnormal coagulation profile should alert one to an underlying infection with a hepatotropic virus as the coagulation profile is usually not deranged in dengue (14). Any patient with prolonged fever should alert the physician of other serious infections with dengue fever, which may be potentially fatal if not promptly recognized and treated. From the epidemiology point of view, family members often manage DF symptomatically, and consequently the diagnosis of dengue infection will be overlooked, remaining unreported (18)

Prolonged fever, highly elevated liver enzymes, deranged prothrombin time along with positive IgM for hepatitis and dengue made us suspicious about the possibility of coexistent viral hepatitis. The endemic areas of both dengue and viral hepatitis throughout the world are most often superimposed on each other and thus one must rule out both these infections when someone presents with acute hepatitis. Presence of acute hepatitis with fever and ascites in an endemic area for hepatitis A and dengue should make one suspicious of coinfection.

Establishing the chances of coinfection and distinguishing between two infections are important in management and complications of acutely sick patient with features of hepatitis. Although complications are common we did not observe any mortality and complete clinical recovery with restoration of normal values of bilirubin, liver enzymes and coagulation profile observed in our case series.

**CONCLUSION:**

In endemic areas, coinfection with dengue and viral hepatitis can be encountered among young adults. A patient presenting with elevated liver enzymes, deranged coagulation profile, prolonged fever, pleural effusion, and thrombocytopenia should alert clinicians towards dengue and hepatitis A coinfection. Highly elevated aminotransferase levels (eight to ten times the upper limit) are consistent with acute viral hepatitis compared with two to three times in dengue fever, and the ratio of aspartate aminotransferase to lactate dehydrogenase is more than 4 in acute hepatitis.

**Contribution Of Authors**

- Conception and design:VR,AR,DA
- Planning and conduction :VR,DA,SH
- Interpretation and analysis:DA,RK

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