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Original Research Article

Clinical and Biochemical Spectrum of Acute Viral Hepatitis A and E in Patients Admitted To A Tertiary Care Hospital

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Abstract

Background: Acute viral hepatitis caused by Hepatitis A virus (HAV) and Hepatitis E virus (HEV) is a common cause of jaundice in developing countries, particularly in regions with poor sanitation and contaminated water supply. Both viruses are transmitted through the fecal–oral route and are responsible for sporadic infections as well as outbreaks.

Objectives: To evaluate the clinical and biochemical spectrum of acute viral hepatitis A and E in patients admitted to a tertiary care hospital.

Materials and Methods: This observational study was conducted using data obtained from the Hospital Management Information System (HMIS) of the Central Pathology Laboratory at MGM Medical College, Aurangabad, Maharashtra, from January 2019 to January 2020. A total of 139 patients with acute viral hepatitis were included, of which 74 were HAV positive and 65 were HEV positive. Demographic details, clinical presentations and biochemical parameters including liver function tests (LFT), renal function tests (RFT) and prothrombin time were analyzed using Microsoft Excel.

Results: HAV infection was more common among patients aged 0–19 years (73%), whereas HEV infection predominantly affected the 20–39 years age group (69.24%). Gender distribution in HAV cases was almost equal, while HEV showed male predominance (58.4%). The most common clinical manifestations were jaundice, yellow coloured urine, nausea and vomiting. Biochemical analysis revealed markedly elevated serum bilirubin and liver enzymes (SGOT and SGPT) in both infections. Co-infection with HEV was observed in 16.21% of HAV cases. The overall prognosis was favorable with no mortality.

Conclusion: HAV predominantly affects children, whereas HEV is more common among young adults. Both infections present with similar clinical features and marked biochemical derangements but usually follow a self-limiting course.

Keywords: Hepatitis A, Hepatitis E, acute viral hepatitis, liver function tests, water-borne hepatitis.

INTRODUCTION

Hepatitis viruses are among the most common causes of jaundice worldwide. Viral hepatitis can be broadly classified into water-borne and blood-borne infections. Hepatitis A virus (HAV) and Hepatitis E virus (HEV) are transmitted mainly through the fecal–oral route and are responsible for water-borne hepatitis,

whereas Hepatitis B, C and D are primarily blood-borne infections. In developing countries with inadequate sanitation and irregular potable water supply, water-borne hepatitis remains a major public health concern. Hepatitis A has traditionally been the most common pathogen causing acute viral hepatitis; however, in recent years Hepatitis E has been increasingly recognized as an important cause of outbreaks and sporadic infections. HEV is a spherical non-enveloped virus measuring about 32–34 nm in diameter with a single-stranded RNA genome and a surface showing indentations and spikes. [1]

Worldwide, HAV is a major cause of water-borne hepatitis, particularly in tropical and subtropical regions. HAV is excreted in the stools of infected individuals and spreads through contaminated food, water and close person-to-person contact. Hepatitis A virus is a non-enveloped RNA virus belonging to the genus Hepatovirus in the family Picornaviridae [2]. The global burden of HAV infection is estimated to exceed 1.5 million cases annually, although the true incidence is likely higher due to underreporting. [3]

The clinical spectrum of HAV infection varies widely, ranging from asymptomatic infection to acute hepatitis with atypical manifestations such as relapsing hepatitis, cholestatic hepatitis and extra-hepatic manifestations [4]. Hepatitis E virus is another important cause of acute viral hepatitis in developing countries and is responsible for large water-borne outbreaks. HEV is estimated to infect nearly 20 million people globally each year, causing about 3.3 million symptomatic cases and approximately 56,600 deaths annually [5]. Co-infection with HAV and HEV may occur as both viruses share a common fecal–oral route of transmission. [6] In India, particularly in regions with irregular water supply and poor sanitation, the risk of water contamination and transmission of enterically transmitted hepatitis viruses remains high. The Marathwada region of Maharashtra frequently faces potable water shortages due to erratic rainfall, increasing the susceptibility of the population to water-borne hepatitis. In recent years, an increasing number of Hepatitis E cases have been observed in this region [7]. Therefore, the present study was undertaken to evaluate the clinical and biochemical spectrum of acute viral hepatitis A and E in patients admitted to a tertiary care hospital.

Materials and Methods

This observational study was conducted by extracting data from the Hospital Management Information System (HMIS) in the Central Pathology Laboratory of MGM Medical College, Aurangabad, and Maharashtra, India.

The study was carried out between January 2019 and January 2020. All patients who were seropositive for IgG and/or IgM Anti-HAV were included in the study. Patients were categorized according to age and sex. Various clinical presentations such as anorexia, vomiting and other symptoms were recorded. Biochemical parameters including liver function tests (LFT) and renal function tests (RFT) were also documented and tabulated. The collected data were compiled and analyzed using Microsoft Excel.

Results

During the study period from January 2019 to January 2020, a total of 139 patients with acute viral hepatitis were admitted to MGM Medical College and Hospital, Aurangabad. Among them, 74 patients were diagnosed with Hepatitis A virus (HAV) infection and 65 patients were diagnosed with Hepatitis E virus (HEV) infection.

Age Distribution

Among HAV patients (n = 74), the majority of patients (73%) belonged to the

age group 0–19 years, followed by 20–39 years (18%) and 40–60 years (9%). The minimum age recorded was 2 years, while the maximum age recorded was 63 years. Among HEV patients (n = 65), the highest number of cases were observed in the 20–39 years age group (69.24%), followed by 40–60 years (20%), while only 10.76% cases were observed in the 0–19 years age group.

Table 1: Age Distribution of HAV and HEV Patients

Age Group (Years)	HAV (n=74)	HEV (n=65)
0–19	54 (73%)	7 (10.76%)
20–39	13 (18%)	45 (69.24%)
40–60	7 (9%)	13 (20%)
Total	**74**	**65**

Gender Distribution: Among HAV patients, the gender distribution was almost equal with 36 males (48.64%) and 38 females (51.35%). Among HEV patients, male predominance was observed, with 38 males (58.4%) and 27 females (41.53%).

Table 2: Gender Distribution of HAV and HEV Patients

Gender	HAV (n=74)	HEV (n=65)
Male	36 (48.64%)	38 (58.4%)
Female	38 (51.35%)	27 (41.53%)
Total	**74**	**65**

Co-infection

Since Hepatitis A and Hepatitis E are both water-borne infections, 12 cases (16.21%) among the 74 HAV patients showed co-infection with HEV.

Clinical Presentation: The clinical presentations ranged from mild symptoms such as nausea and vomiting to hepatomegaly. Among HAV patients, the most common clinical manifestations were yellow coloured urine and jaundice (67%), followed by anorexia (60%). Nausea and vomiting were seen in 52% of cases, while pain in abdomen and hepatomegaly were observed in 20% and 25% of patients respectively.

Among HEV patients, jaundice (83.07%) and yellow coloured urine (76.92%) were the most common presentations.

Nausea/vomiting (73.84%) and anorexia (63.07%) were also frequently observed, while pain in abdomen (53.84%) and hepatomegaly (47.69%) were seen in a smaller proportion of patients.

Table 3: Signs and Symptoms of HAV and HEV Patients

Signs and Symptoms	HAV (n=74)	HEV (n=65)
Nausea/Vomiting	38 (52%)	48 (73.84%)
Anorexia	45 (60%)	41 (63.07%)
Jaundice	49 (67%)	54 (83.07%)
Yellow coloured urine	50 (67%)	50 (76.92%)
Pain in abdomen	15 (20%)	35 (53.84%)
Hepatomegaly	19 (25%)	31 (47.69%)

Biochemical Findings: Biochemical investigations including liver function tests (LFT), renal function tests (RFT), prothrombin time (PT) and serum protein estimation were performed in all patients. In HAV patients, the mean total bilirubin

was 5.69 mg/dl with a range of 1.1–18.6 mg/dl, while direct bilirubin had a mean value of 4.81 mg/dl.

Liver enzymes were markedly elevated with mean SGOT 746.44 U/L and mean SGPT 1138.34 U/L.

In HEV patients, the mean total bilirubin was 9.4 mg/dl with a range of 0.9–39.8 mg/dl, while direct bilirubin showed a mean value of 8.6 mg/dl. Liver enzymes were also markedly elevated with mean SGOT 1061.6 U/L and mean SGPT 1149.7 U/L.

Serum total protein, albumin and globulin levels were within normal limits in most patients. Prothrombin time was elevated in a significant proportion of cases.

Renal function tests were normal in most patients, although some patients showed elevated serum urea and creatinine levels.

Table 4: Biochemical Parameters in HAV and HEV Patients

Investigation	HAV Mean	HAV Max	HAV Min	HEV Mean	HEV Max	HEV Min
Total Bilirubin	5.69	18.6	1.1	9.4	39.8	0.9
Direct Bilirubin	4.81	17.1	0.4	8.6	38.8	0.2
SGOT	746.44	8397	17	1061.6	8397	14
SGPT	1138.34	13308	19	1149.7	5227	17
ALP	310.51	885	15	199.2	476	86
Protein	6.05	10.9	4.3	6.1	8.3	4.7
Albumin	3.14	5.5	2.3	3.3	4.4	2
Globulin	2.90	5.4	2	2.7	3.9	2.2
PT	13.98	28.8	11	16.2	78.3	7.7
Urea	13.41	54	0.4	21.2	137	1.1
Creatinine	0.91	10.6	0.2	1.02	3.9	0.4

Outcome

The overall prognosis was good in the present study and no mortality was observed.

Discussion

Acute viral hepatitis caused by Hepatitis A virus (HAV) and Hepatitis E virus (HEV) remains a significant public health problem in developing countries, particularly in regions with poor sanitation and unsafe drinking water. Both viruses are transmitted mainly through the fecal–oral route and are frequently associated with outbreaks and sporadic infections linked to contaminated water supplies. As described by Khalili and Sharifi-Mood, HAV infection is usually self-limiting and rarely progresses to fulminant hepatitis, although the severity of disease depends on host immunity and viral factors. [1] Similarly, Gupta and Agarwal highlighted that HEV infection commonly presents with prodromal symptoms such as malaise, anorexia and nausea followed by jaundice and dark coloured urine. [6]

In the present study, HAV infection was predominantly observed in younger individuals, with the majority of cases occurring in the age group of 0–19 years. Similar findings were reported by Arankalle et al., who documented a higher prevalence of HAV infection among children in India. [3] Handa et al. also reported that HAV infection is commonly seen in the pediatric population due to early exposure to contaminated water sources in endemic areas. [2] In contrast, HEV infection in our study was more commonly observed among young adults, particularly in the age group of 20–39 years. Comparable findings were reported by Kamat et al., who observed that HEV infection predominantly affects adults in

the productive age group. [8] Studies by Desai et al. and Kaur et al. have also demonstrated that HEV infection is frequently seen among young adults and is a major cause of water-borne viral hepatitis in endemic regions of India. [9,10] The gender distribution in the present study showed nearly equal involvement of males and females among HAV patients, while a slight male predominance was observed among HEV patients. Similar observations were reported by Joon et al., who found that both HAV and HEV infections affect males slightly more frequently than females among patients presenting with acute viral hepatitis. [11] Such variations may be influenced by differences in environmental exposure, occupational risk factors and healthcare-seeking behaviour.

Co-infection between HAV and HEV was also observed in our study. Since both viruses share the same fecal–oral route of transmission, simultaneous infection may occur in areas where contamination of water sources is common. Similar findings have been reported by Arora et al., who described water-borne outbreaks involving both HAV and HEV infections. [13] Likewise, Monika et al. reported the occurrence of HAV and HEV co-infection among patients presenting with acute viral hepatitis in endemic regions. [14]

In our study, the most common clinical manifestations were jaundice and dark or yellow coloured urine followed by anorexia, nausea and vomiting. Similar clinical findings were reported by Bhorgave et al., who observed jaundice and gastrointestinal symptoms as the most frequent presentations among children with HAV infection. [4] Studies by Kamat et al. and Desai et al. also reported jaundice as the predominant clinical presentation among patients with HEV infection. [8,9] Biochemical investigations in the present study demonstrated markedly elevated serum bilirubin levels and liver enzymes (SGOT and SGPT), which are characteristic findings in acute viral hepatitis. Similar biochemical abnormalities have been reported in previous studies evaluating the clinical profile of HAV and HEV infections. [8,9] Elevated transaminase levels reflect hepatocellular injury, while increased bilirubin levels correspond with the severity of jaundice.

Prolongation of prothrombin time observed in some patients in our study suggests transient impairment of hepatic synthetic function during the acute phase of infection. Similar findings were reported by Murthy et al., who observed that increased prothrombin time may be associated with disease severity in patients with HEV infection. [12]

Despite the occurrence of complications in a few patients, the overall prognosis in our study was favourable and no mortality was observed. Acute viral hepatitis caused by HAV and HEV generally follows a benign and self-limiting course when diagnosed early and managed with supportive treatment. [1]

Overall, the findings of the present study highlight that HAV infection predominantly affects children and adolescents, whereas HEV infection is more common among young adults. The clinical manifestations and biochemical abnormalities observed in our study are consistent with previously reported studies. Improvement in sanitation, provision of safe drinking water and early diagnosis remain crucial strategies for preventing outbreaks and reducing the burden of water-borne viral hepatitis in endemic regions. [7]

Conclusion

Acute viral hepatitis due to HAV and HEV commonly presents with jaundice, dark coloured urine, nausea and vomiting, along with markedly elevated liver enzymes and bilirubin levels. In the present study, HAV infection was more common among individuals below 20 years of age, whereas

HEV predominantly affected young adults. Most cases showed a self-limiting course with favorable outcomes. These findings highlight the continued burden of water-borne hepatitis in regions with poor sanitation and emphasize the importance of safe water supply, improved hygiene and appropriate vaccination strategies for prevention.

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