

# PREVALENCE OF ACUTE VIRAL HEPATITIS IN SYMPTOMATIC PATIENTS IN A TERTIARY CARE HOSPITAL OF NORTH INDIA

## ABSTRACT

### Background :

Acute Viral Hepatitis (AVH) is a major health problem worldwide, with a higher incidence in developing countries, like India. The most common cause of viral hepatitis is a specific group of hepatic viruses A, B, C and E (HAV, HBV, HCV and HEV). Their clinical manifestations range from asymptomatic to acute and fulminant hepatitis or chronic hepatitis. Exploring the etiological spectrum and clinic-epidemiological profile of AVH becomes essential for formulating the preventive measures to control the disease. The aim of the present study was to determine the prevalence of Hepatitis A virus (HAV), Hepatitis B virus (HBV), Hepatitis C virus (HCV) and Hepatitis E virus (HEV) as causes of AVH in a tertiary care hospital of North India. **Material and Methods :** A retrospective study was conducted on 122 patients with clinical signs and symptoms of acute viral hepatitis during May 2021 to April 2022. Serum was separated and tested for IgM anti-HAV antibodies, IgM anti-HEV antibodies, Hepatitis B surface antigen (HbsAg) and IgM anti-HCV antibodies by Enzyme Linked Immunosorbent Assay (ELISA). **Results :** Out of 122 AVH patients, HAV (41.80%) was identified as the most common cause of acute hepatitis followed by HEV (36.88%), HBV (17.21%) and HCV (13.11%). Co-infections with more than one virus were present in 28 cases; HAV-HEV co-infection being the most common. Amongst the positive AVH cases, the seropositivity was higher in males (60.65%) than females (39.34%). The most common symptom was Icterus ( 64.87% ), followed by fever (52.51%), pain abdomen (50.91%), anorexia (46.22%), vomiting (26.24%), malaise (21.24%) and diarrhea (12.23%). **Conclusion :** In our present study we have found that HAV is the most common cause of acute viral hepatitis followed by HEV, HBV and HCV with icterus being the most common symptom followed by fever, pain abdomen, anorexia, vomiting, malaise and diarrhea. Regular diagnosis of AVH and monitoring of cases will help in patient management and thus reduce morbidity and mortality.

**Keywords :** *Acute viral hepatitis; ELISA; Seroprevalence*

## **INTRODUCTION**

“Acute Viral Hepatitis (AVH) is a considerable public health burden affecting millions of people in India. The most common cause of viral hepatitis is a specific group of hepatic viruses A, B, C and E (HAV, HBV, HCV and HEV)”.<sup>1</sup> “Co-infection with Hepatitis A virus and Hepatitis E virus, Hepatitis B virus and Hepatitis C virus is quite frequent due to their shared mode of transmission”.<sup>2</sup> “Both HAV and HEV are transmitted by faeco-oral route while HBV and HCV are transmitted through parenteral route, sexually or through mother to child transmission”.<sup>3</sup> “Their clinical manifestations range from asymptomatic to acute and fulminant hepatitis or chronic hepatitis. Acute illness is characterized by fever, jaundice, nausea, malaise and pain abdomen. Hepatitis symptoms are so non-specific, perfect diagnosis cannot be achieved through history and physical examination alone. An accurate diagnosis can only be made by testing patients’ sera for the presence of specific anti-viral antigens or antibodies”.<sup>4</sup> “The variability in nature of the disease regarding its onset, presenting symptoms, clinical course and development of complications in viral hepatitis are important aspects which require clinical attention from time to time. Hence, exploring the etiological spectrum and clinic-epidemiological profile of AVH becomes essential for formulating the preventive measures to control the disease”.<sup>1</sup> The aim of the study was to know the etiological spectrum and prevalence of hepatotropic viruses in AVH patients at a tertiary care hospital of North India.

## **MATERIAL AND METHODS**

### **STUDY AREA**

A retrospective study was conducted from May 2021 to April 2022 in the Department of Microbiology, GMC, Amritsar. “Acute hepatitis case was defined as an acute illness with clinical symptoms (eg. fever, malaise, nausea, vomiting, loss of appetite, dark urine and right upper quadrant tenderness) with jaundice or serum alanine transaminase

(ALT) levels >200 IU/L or atleast twice upper limit of normal without having a history of chronic liver disease".<sup>3</sup>

## **STUDY POPULATION**

This study was conducted on 122 patients with clinical signs and symptoms of acute viral hepatitis. Clinical and demographic information was recorded in predesigned format.

## **SAMPLE COLLECTION**

5 ml of blood samples were collected aseptically into EDTA. Serum was separated by a low speed centrifugation at 1500 rpm for 5 min.

## **LABORATORY ANALYSIS**

The serum was tested for the presence of IgM anti-HAV antibodies, IgM anti-HEV antibodies, Hepatitis B surface antigen (HbsAg) and IgM anti-HCV antibodies by Enzyme Linked Immunosorbent Assay (ELISA) as per manufacturer's instructions.

## **RESULTS**

During the study period (May 2021 to April 2022), the study population included 122 AVH patients. The sero-positivity of hepatotropic viruses was higher among males [74 (60.65%)] than females [48 (39.34%)]. Out of 122 cases, 64 (52.45%) were adults and 58 (47.54%) were children. Amongst adults, 42 (65.62%) were males and 29 (45.31%) were females. Amongst children, 32 (55.17%) were males and 19 (32.75%) were females. HAV was found in maximum number of cases (41.80%), followed by HEV (36.88%), HBV (17.21%) and HCV (13.11%). Co-infection of HAV and HEV was detected in 6 (4.92%) cases and co-infection of HBV and HCV was detected in 3(2.45%) cases. Most common presenting complaints were Icterus ( 64.87% ), followed by fever (52.51%), pain abdomen (50.91%),anorexia (46.22%), vomiting (26.24%), malaise (21.24%) and diarrhoea (12.23%).

Figure 1 : Prevalence of HAV,HEV, HBV and HCV in AVH positive patients (n= 122).

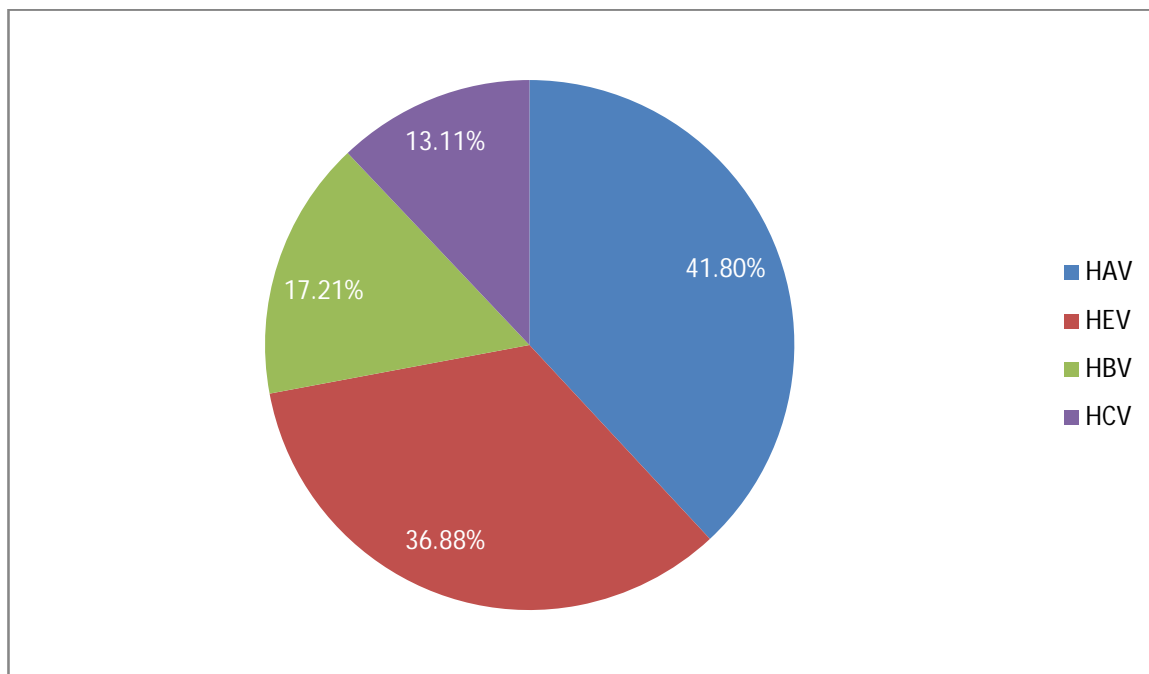
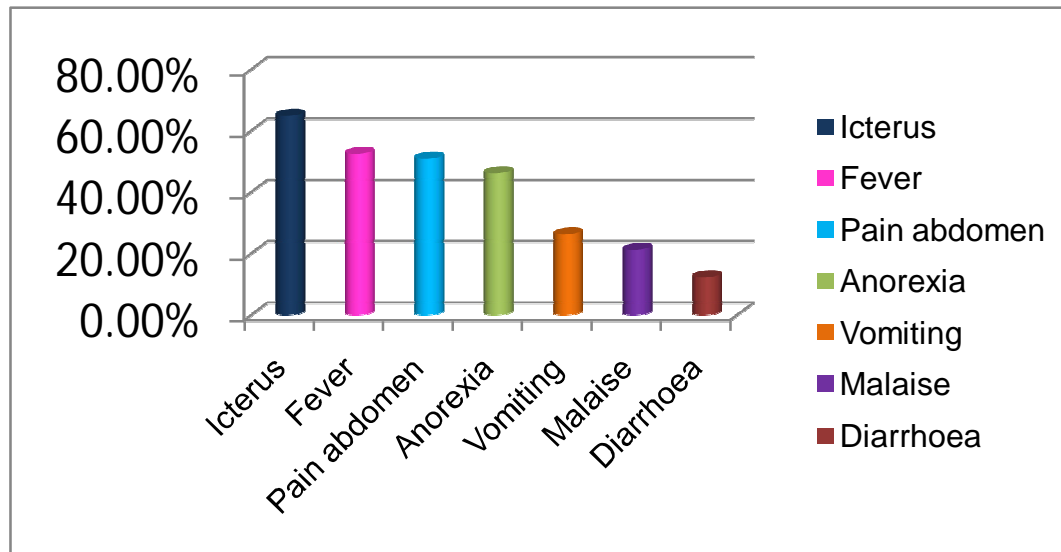


Table 1: Age-wise and Sex-wise distribution of AVH patients

<b>Virus</b>	<b>Children (n=58)</b>	<b>Adults (n=64)</b>	<b>Total (n=122)</b>
HAV	39 (67.24%)	12(18.75%)	51 (41.80%)
HBV	0	21 (32.81%)	21 (17.21%)
HCV	0	16 (25.0%)	16(13.11%)
HEV	11(18.96%)	34 (53.12%)	45 (36.88%)
<b>SEX</b>			
Male	32 (55.17%)	42 (65.62%)	74 (60.65%)
Female	26 (44.82%)	22(34.37%)	48 (39.34%)

Figure 2 : Clinical symptoms in AVH patients (n=122)



## DISCUSSION

The overall percentage positivity of acute viral hepatitis was 31.60%. In a similar study conducted by Bharde PV *et al* seropositivity of AVH was found to be 31.4%.<sup>1</sup> However, Rajani M *et al* detected 21.3% seroprevalence of AVH.<sup>5</sup> Higher prevalence of 56.83% of AVH was seen in a study conducted by Kumar R *et al*.<sup>6</sup> Out of 122 positive AVH cases, adults were found in higher number than children. Kumar R *et al* also found that the positivity was higher among adults (53.55%) than children (46.45%).<sup>6</sup> In a similar study conducted by Arya RK *et al*, adults (58%) were more affected than children (20%).<sup>7</sup> In present study positivity was higher among among males (60.65%) than females (39.34%). Jain P *et al* also showed in his study that males (62.54%) outnumbered females (37.45%).<sup>8</sup> In a similar study by Kumar R *et al*, AVH was found higher in males (66.38%) than females (36.61%).<sup>6</sup> “Higher prevalence among males may be attributed to their greater risk of exposure to the contaminated water and travelling”.<sup>1</sup>

In present study, highest prevalence was shown by HAV (41.80%) followed by HEV (36.88%), HBV (17.21%) and HCV (13.11%). This was in accordance with a study

conducted by Jain P *et al* which also showed similar pattern of positivity with highest rate of HAV (26.96%) followed by HEV (17.97%), HBV (16.10%) and HCV (11.98%).<sup>8</sup>

Co-infection of HAV and HEV was detected in 4.92% cases and co-infection of HBV and HCV was detected in 2.45% cases. In a similar study by Jain P *et al*, co-infection with HAV and HEV was detected in 7.31% cases and co-infection with HBV and HCV was detected in 1.46% cases.<sup>8</sup> Beniwal *et al* also recorded dual infection with HAV and HEV of 3.1%.<sup>9</sup> “Co-infection is due to their shared mode of transmission. Feco-oral route, contaminated water and food supply are the major mode of transmission for HAV as well as HEV”.<sup>2</sup> Similarly, HBV and HCV have same mode of transmission like intravenous drug use, blood transfusion and vertical transmission.<sup>10</sup>

Most common presenting complaints in present study were Icterus ( 64.87% ), followed by fever (52.51%), pain abdomen (50.91%),anorexia (46.22%), vomiting (26.24%), malaise (21.24%) and diarrhea (12.23%). Jabbar A *et al* also determined icterus (100%) as the most common presenting symptom followed by fever (87%) and hepatic tenderness (83%) in his study.<sup>11</sup> In a similar study done by Kumar R icterus was found “in 100% of cases, followed by fever (52.5%), abdominal pain with right upper quadrant tenderness (50.9%), vomiting (33%), nausea (28.6%), anorexia (27.8%) and malaise (25.7%)”.<sup>6</sup> “However, in the study of Modi *et al* they found the commonest presenting symptoms were nausea/ vomiting (88%), anorexia (85%), abdominal pain (49%) and hepatomegaly (30%)”.<sup>12</sup>

## **CONCLUSION**

The global public health impact of AVH is immense. In the present study, Hepatitis A virus was observed in most cases followed by Hepatitis E, Hepatitis B and Hepatitis C virus with commonest presenting symptom of icterus followed by fever, pain abdomen, anorexia, vomiting, malaise and diarrhea. The variability in the nature of the disease regarding its onset, presenting symptoms, clinical course and the development of complications in hepatitis is an important aspect which requires attention from time to time.<sup>11</sup> Awareness of the clinical symptoms of acute viral hepatitis is also important for the early identification and seeking of medical attention so as to prevent

morbidity and mortality related to the disease.<sup>13</sup> The public health sectors need to work in collaboration to increase public awareness, facilitate timely preparation and make necessary arrangements to counter outbreaks or epidemics and thus reduce morbidity, mortality and economic burden.<sup>14</sup>

## Consent

Written informed consents were taken from patients or guardians.

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