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Original Research Article

A Study on Seroprevalence of Hepatitis A Virus and Hepatitis E Virus and Their Co-Infection in District Hospital

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Abstract

Introduction: 'Viral Hepatitis' denotes a primary infection of liver by heterogeneous group of Hepatitis virus. They are clinically indistinguishable, leading to morbidity and mortality. Mainly diagnosed by serological and molecular markers. Hepatitis A and Hepatitis E viruses are transmitted by faeco-oral route and cause sporadic as well as outbreaks of acute viral hepatitis. ***Objectives:*** Prevalence of HAV and HEV in patients of acute viral hepatitis along with their co-existence and correlate it with seasonal trend. ***Materials & Methods:*** Study was conducted in our institute from January to December, 2018. 275 samples were tested for HAV and HEV infection of clinically suspected cases. Samples were analyzed for anti HEV IgM and anti HAV IgM antibody by ELISA method. ***Results:*** Out of 275 samples, 66 were positive for anti HAV IgM indicating prevalence rate of 24%, majority patients were in pediatric age group of 0-14 yrs. In case of HEV, 71 samples were positive with prevalence rate of 25.8%, majority patients were in age group 15-45 yrs. Infection rate was higher in males. Co infection rate was 1.09%. Seasonal trend shows maximum positive cases in summer and monsoon. ***Conclusion:*** HAV and HEV infection should be considered as an etiology of acute infectious viral hepatitis. It is suggested that health care facilities should make an effort to increase the awareness among general public for personal hygiene and cleanliness, thus reduce morbidity, mortality and economic burden.

Keywords: Hepatitis A virus (HAV), Hepatitis E virus (HEV), viral hepatitis, Seroprevalence, co-infection.

INTRODUCTION

Viral hepatitis is a major public health problem in India and worldwide. Cases have been reported throughout the country [1]. Primarily, viral hepatitis is caused by hepatitis A virus (HAV), hepatitis B virus, hepatitis C virus, hepatitis D virus and hepatitis E virus (HEV) and dengue virus [2, 3].

Hepatitis-A virus infection (HAV) and Hepatitis E virus infection (HEV) are enterically transmitted viral diseases of great public health importance in the developing countries like India. HAV has a world-wide distribution and affects infants and young children in developing countries but its epidemics are rare; whereas HEV is restricted to tropical countries and affects older children and young adults and its epidemics are common [4, 5].

In developing countries like India, HAV and HEV both are endemic. Exposure rates over a period of time are different in different parts of the country and in different socio-economic groups [1]. Hepatitis E virus (HEV), an emerging pathogen [6] causes significant disease in endemic countries and is the leading cause of enterically transmitted viral hepatitis illness globally [7].

HEV infection usually does not become chronic, but chronic infections have recently been reported in transplant recipients. HEV infection in pregnant women is more common and more fatal in the third trimester. The mortality rate due to HEV-induced hepatitis is as high as 15-20% [8].

This study was conducted to determine the prevalence of HAV and HEV and their co-infection among patients attending a civil hospital in Gandhinagar, India, presenting with symptoms of acute hepatitis.

MATERIAL AND METHODS

This study was conducted in the Microbiology Department of Gandhinagar Medical College and attached civil Hospital, Gandhinagar, Gujarat, India, for the duration of one year (January 2018 to December 2018).Total 275 blood samples collected in plain

vacutte from the acute hepatitis patients, their demographic data were collected in sample request form. The serum samples were analyzed for anti HAV IgM and anti HEV IgM for the detection of acute hepatitis A and acute Hepatitis E, respectively using commercially available Enzyme Linked Immunosorbant Assay (ELISA) kits (Recombilisa, HAV IgM, Recombilisa, HEV IgM). The procedures were followed as per the manufacturer's instructions mentioned in the literatures provided within the ELISA kits.

RESULTS

A total of 275 serum samples were tested in department of Microbiology for anti HAV IgM and anti HEV IgM detection. In the age group of <15 years, 48cases; age group of 15–29, 121 cases; age group of 30–44, 66 cases and age group of >45 years 40 cases were studied. Age wise distributions of cases were shown in table no-1. Among all the samples, 163 and 112 were male and female respectively. Out of 275 samples, 66 samples were only HAV IgM positive, 71 samples were only HEV IgM positive and 3 samples were found positive for both HAV and HEV IgM. The overall prevalence of HAV and HEV infection was found 49.8%. The prevalence of HAV infection was found to be 24%, HEV infection 25.8% and HAV-HEV co-infection 1.09%. In our study, Maximum number of HAV infection was found in the age group of 0-14 years (33,68.8%) and HEV infection was found in the age group of 15-44 years (62,33.1%)

Table-1: Age group wise sample distribution

Age Group	Total No. of Samples	HAV positive	HEV positive
0-14	48	33(68.8%)	2(4.2%)
15-29	121	29(24%)	38(31.4%)
30-44	66	2(3%)	24(36.4%)
45 and above	40	2(5%)	7(17.5%)
Total	275	66(24.0%)	71(25.8%)

Among 163 Male patients, 34(20.9%) were positive for HAV infection and 52(31.9%) were positive for HEV infection. While in female out of 112 samples, 32(28.6%) were positive for HAV infection and 19(17%) were positive for HEV infection. Gender distribution is shown in Table-2.

Table-2: Gender wise positive cases

Gender	Total	HAV Positive	HEV Positive
Male	163	34(20.9%)	52(31.9%)
Female	112	32(28.6%)	19(17.0%)
Total	275	66(24%)	71(25.8%)

HAV and HEV was seen to be prevalent all around the year with maximum cases seen during summer and monsoons. Seasonal trend was shown in Figure-1.

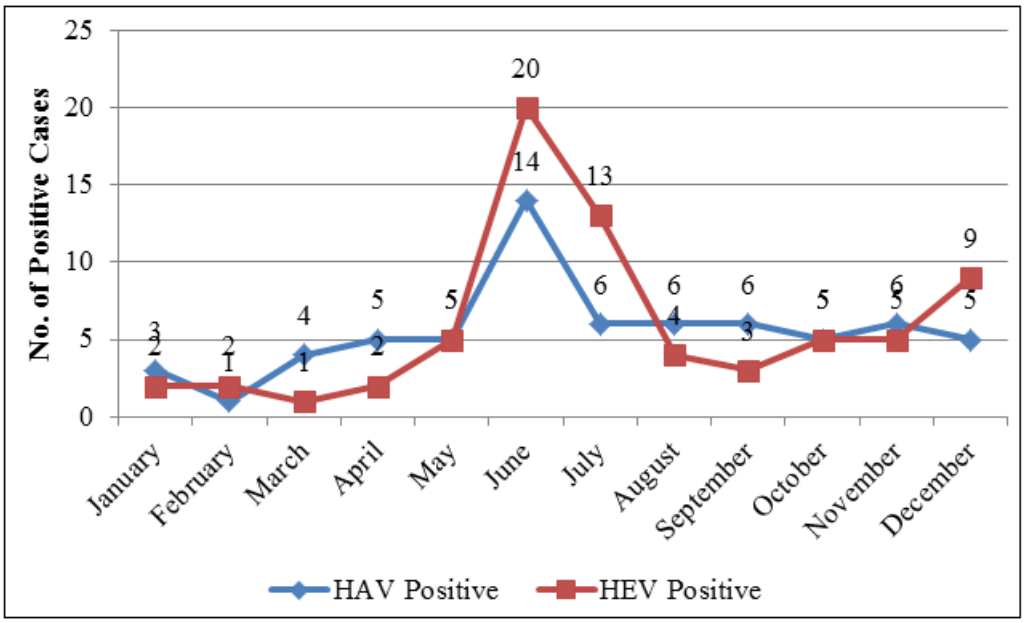

Fig-1: Seasonal trends of HAV & HEV positive cases

DISCUSSION

This study was conducted mainly to determine the prevalence of HAV and HEV and their co-infection in Gandhinagar region. Various studies on Acute viral hepatitis caused by HAV and HEV have reported varying prevalence of both viruses. Agrawal *et al*., reported as low as 9.47% prevalence rate of HAV [9] while 67% rate was reported by Kwon *et al*., [10]. Joon *et al.*, found 10.54% of HEV prevalence in their study performed in Southern part of India [11] and a higher prevalence rate of 49.7% was recorded in a study done on North-Western part of India [12]. In this study, only 24% of the suspected cases had a positive hepatitis A viral marker and 25.8% positive hepatitis E viral marker. The water supply in Gandhinagar city and nearby regions is pretreated and filtered that explains the lower rate of water borne viral hepatitis.

Prevalence of HAV-HEV co-infection cases varies in different parts of India. Authors have reported it as low as 0.8% [14], and as high as 11.5% [11]. The prevalence of HAV-HEV co-infection found in this study was 1.09% cases, which was very well correlated with the study of Prabhat *et al.*, [15].

It is believed that HAV infection is a disease of infants and young children and the same was found in our study with 68% of total HAV positivity in children below 14 years. On the other side, HEV was found maximum positive in population of 11–45 age groups with slightly more frequent in males than females. This justifies the preponderance of HEV infection in older children and young adults [15].

Prevalence of both HAV and HEV was higher in males than in females, this finding is consistent with other studies [9, 11]. The reason for higher prevalence in males can be explained by their greater exposure in professional and social activities.

The present study shown HAV and HEV infection has a seasonal trend having maximum positive cases in summer and monsoon that is April to September [13].

CONCLUSION

HAV and HEV infection should be considered as an etiology of acute infectious viral hepatitis, showing a seasonal trend having maximum positive cases in summer and monsoon that is April to September, as this infection is acquired through feco-oral route. It is suggested that health care facilities should make an effort to increase the awareness among general public for personal hygiene and cleanliness, thus reduce morbidity, mortality and economic burden.

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