



A STUDY OF HEPATITIS A AND HEPATITIS E VIRUS IN CLINICALLY SUSPECTED CASES OF ACUTE VIRAL HEPATITIS AT A TERTIARY CARE HOSPITAL.

Dr. Jayshri Pethani	Professor and Head, Department of Microbiology, N.H.L. M.M.C., Ahmedabad
Dr. Hitarthi Mehta*	3 rd year Resident, Department of Microbiology, N.H.L. M.M.C., Ahmedabad *Corresponding Author
Dr. Komal Dholaria	3 rd year Resident, Department of Microbiology, N.H.L. M.M.C., Ahmedabad
Dr. Atit Shah	Associate Professor, Department of Microbiology, N.H.L. M.M.C., Ahmedabad
Dr. Bimal Chauhan	Assistant Professor, Department of Microbiology, N.H.L. M.M.C., Ahmedabad
Dr. Lata Patel	Tutor, Department of Microbiology, N.H.L. M.M.C., Ahmedabad

ABSTRACT

INTRODUCTION: Hepatitis A virus(HAV) and Hepatitis E virus(HEV) are both enterically transmitted, resulting in acute viral hepatitis(AVH) in developing countries.

METHODS: This study was done a record based at tertiary care hospital, Ahmedabad from January 2016 to December 2016 for the detection of HAV and HEV, using commercially available ELISA kits.

RESULTS: Out of 1325 samples, 342 were positive for HAV, indicating a prevalence rate of 25.8%, majority patients were in the paediatric age group 1-10 years. In the case of HEV, 796 samples were positive indicating prevalence rate of 60%, majority patients were in adult age group 20-30 years. The seroprevalence of both HAV and HEV in patients with acute viral hepatitis was 4.22%, with 53.5% were males and 46.4% females.

CONCLUSION: This study shows a high prevalence of HEV than HAV. Prevalence was higher in adult and paediatric age group in case of HEV and HAV respectively and their co-infection rate was 4.22%.

KEYWORDS : Acute viral hepatitis, Hepatitis A virus, Hepatitis E virus.

INTRODUCTION

Acute viral hepatitis (AVH) is a major public health problem in India and other developing nations having inadequate sanitary conditions. Acute viral hepatitis is a systemic infection affecting the liver predominantly. It is caused by six distinct types of viruses A, B, C, D, E and G.¹

Hepatitis A virus (HAV) and hepatitis E virus (HEV) causes a self-limiting viral infection that is transmitted by the faecal-oral route, primarily through consumption of contaminated food and water. These infections are major health problem worldwide, with a higher incidence in developing countries. Enterically transmitted viral hepatitis is of great public health importance in India. HAV and HEV both are endemic in developing countries like India where conditions of hygiene and sanitation are poor. HAV infections account for 1.4 million new cases per year worldwide,² and the risk of infection is inversely proportional to levels of sanitation and personal hygiene. Infections due to HAV is mostly asymptomatic, self-limiting and exposure to the virus provides lifelong immunity.³ HAV mainly affects infants and young children and in developing countries, nearly all children are infected with HAV by the age of 18 and as the standard of living improves, the peak incidence of hepatitis A moves from young children to older age.⁴

Hepatitis E virus (HEV) was first identified in 1983. It causes sporadic cases of hepatitis or outbreaks and the disease is generally self-limited although it may cause fulminant hepatitis in pregnant women, elderly, those with underlying chronic hepatitis, immunosuppressed, and transplant recipients.⁵

HAV and HEV are an important cause of acute viral hepatitis and acute liver failure in India. The most common clinical consequence of infection with hepatitis A or E virus is acute hepatitis. A large majority of people with acute viral hepatitis recover spontaneously within a few weeks, without any residual consequences. However, in some persons, acute liver failure (ALF) may occur. Patients with ALF have a high case-fatality rate, in the absence of liver transplantation,

which is either inaccessible or non-affordable for a large majority of the Indian population. Infection with HBV, HCV, or HDV too may present as acute hepatitis. However, these viruses have the potential to cause persistent infection in a subset of those infected. Such an infection may be associated with ongoing liver damage, which may progress to liver cirrhosis or liver cancer, which can be life-threatening.⁶

The current trend shows an increase in the prevalence of HAV and HEV co-infection, hence this study was conducted to determine the prevalence of HAV and HEV and their co-infection in patients presenting with AVH.

METHODS

This study was done a record based at tertiary care hospital, Ahmedabad from January 2016 to December 2016. This study included 1325 serum samples of patients during a one-year period presenting with acute viral hepatitis. The study population included sera of individuals from all age group who were suspected of acute viral hepatitis admitted at V.S.G.H hospital, Ahmedabad. An Acute Viral Hepatitis (AVH) case was defined as a person having an acute illness of fewer than 15 days duration with a discrete onset of any sign or symptom (e.g., fever, headache, malaise, anorexia, nausea, vomiting, diarrhoea and abdominal pain) and either a) jaundice or b) elevated serum alanine aminotransferase (ALT) levels more than 100IU/L documented at least twice at a 1-week interval without any history of pre-existing liver disease.⁷

Three ml of human blood sample irrespective of age and gender was collected from each patient. Serum was separated with centrifugation of each sample and stored at -20 °C until tested. The only adequate amount of non-haemolysed, non-lipemic serum without precipitate or particulate matter was tested.

On the basis of history, serum samples were analysed for IgM anti HAV and IgM anti-HEV for the detection of acute hepatitis A and acute hepatitis E, respectively using commercially available ELISA kits (for HAV IgM ELISA and for HEV IgM ELISA).

Statistics

Data collected was fed into Microsoft Excel and analysis was done using SPSS version 18. A statistical test (chi) 2 was used for analysing qualitative variable and Student 't' test for a quantitative variable. $P < 0.05$ was taken as statistically significant.

RESULTS

The study was conducted at V.S.G.H hospital, Ahmedabad, from January 2016 to December 2016. Out of 1325 samples, 342 were positive for HAV, 796 samples were positive for HEV and 56 were positive for both HAV and HEV. (Table no.1)

Table 1. Prevalence of Hepatitis A virus & Hepatitis E virus in patients with Acute Hepatitis

	Total Samples	Positive Samples
HAV*	1325	25.8%(342)
HEV**	1325	60%(796)
HAV*and HEV**	1325	4.22%(56)

* Hepatitis A Virus ** Hepatitis E Virus

Thus, the prevalence rate for HAV positive was 25.8%, in which majority of patients were in the paediatric age group 1-10 years and the prevalence rate for HEV positive was 60%, in which majority of patients were in adult age group 20-30 years. (Table no.2)

Table 2. Age wise distribution of Hepatitis A virus & Hepatitis E virus

Age group	No. of positive cases for HEV**	No. of positive cases for HAV*	No. of positive cases for HAV* and HEV**
<1 year	0	1	0
1-10 years	32	138	18
10-20 years	223	75	14
20-30 years	267	11	8
30-40 years	165	1	7
40-50 years	63	2	6
50-60 years	0	110	2
>60 years	46	4	1
Total	796	342	56

*Hepatitis A Virus ** Hepatitis E Virus

In HAV, out of 342 patients, 50.2%(171) were males and 48.2% (165) were females, in HEV out of total 796 patients 64.4% (512) were males and 35.5% (283) were females. Co-infection rate was 4.22%(56), out of which 53.5% (30) were males and 46.4% (26) were females. (Table no.3)

Table 3. Prevalence of Hepatitis A virus & Hepatitis E virus in males and females

	Total positive samples	Total positive in Males	Total positive in Females
HAV*	342	50.2%(171)	48.2%(165)
HEV**	796	64.4%(512)	35.5%(283)
HAV* and HEV**	56	53.5%(30)	46.4%(26)

* Hepatitis A Virus ** Hepatitis E Virus

DISCUSSION

In the present study, HEV (60%) was identified to be the most common cause of acute viral hepatitis followed by HAV (25.8%). This study is in accordance with the study of Nirav Pandya et al., where HEV (26.66%) was identified to be the most common cause of acute viral hepatitis followed by HAV (10.79%). Co-infection of HAV and HEV was more common in paediatric age group(1-10years) as compared to the adult age group which in accordance with the study of Nirav Pandya et al. where co-infection was found in 7-year-old male child.⁸

The reason for this may be paediatric age group are not immune to HAV and also due to poor sanitation and contamination of water,

they are exposed to HEV too so they develop simultaneous infection by both the viruses.⁹

The infection rate of HEV was higher in the age group of 20-30 years(33.54%) which is similar with the previous study by Ramesh roop rai, who described most common age group of 16-30 years of age.¹⁰

HAV infection acquires in childhood and by age of ten 90% of the population possess antibody to the virus and are immune. So, HAV is less commonly seen in adults, mitigating a finding of our study.

Acute hepatitis A is usually improved by conservative management, but in another case report, it was found that co-infection of HAV and HEV may lead to severe forms of disease such as hepatic encephalopathy.¹¹

It is possible that HEV infection is usually asymptomatic and goes unnoticed in children. These findings also agree with the results found in some other studies too.^{12,13}

The age-specific seroprevalence of antibody to HEV was studied in Pune, India. Antibodies to HEV were uncommon in children and reached a peak prevalence of 33-40% in early adulthood.

Prevalence of both HAV and HEV were higher in males than in females which have correlated with other studies.^{12,14}

It could be explained by a greater exposure of men in their professional and social activities. Considering the seasonal variations, HAV and HEV was seen to be prevalent all around the year with predominance seen towards the end of monsoons and beginning of winters and also a peak of HEV during the beginning of winters and also a peak rise of HEV during the beginning of rainy season. Hepatitis E is mainly transmitted by cross-contamination of drinking water with sewage. Hepatitis A was more common in winter and Hepatitis E was more common in summer.

CONCLUSION

This study shows a high prevalence of HEV than HAV. Prevalence was higher in adults and paediatric age group in case of HEV and HAV respectively. The preponderance of males was observed in both types of viral hepatitis. Even though all types of viral hepatitis are being a public health problem to the community, the HEV stands as a continuous burden through the outbreaks of epidemics and its endemicity. This could be controlled by ensuring the safe drinking water supply and good standards of sanitation and of personal and food hygiene.

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