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PREVALENCE OF HEPATITIS A VIRUS (HAV) AND HEPATITIS E VIRUS (HEV) AS CAUSES OF ACUTE VIRAL HEPATITIS IN A TERTIARY CARE HOSPITAL OF EASTERN INDIA

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ABSTRACT

Introduction: Acute viral hepatitis (AVH) because of Hepatitis A (HAV) and E virus (HEV) is a major public health problem and is an important cause of morbidity and mortality. The aim of the present study is to determine the prevalence of HAV and HEV in patients presenting with AVH and the co-infection of HAV and HEV in these patients. Material and methods: A cross-sectional study of 11 months duration was conducted in Microbiology department involving 180 patients presenting with AVH. On the basis of clinical presentation selected serum samples were analysed for IgM anti-HAV and IgM anti-HEV for the detection of HAV and HEV, respectively using commercially available ELISA kits. Results: The seroprevalence of HAV- and HEV-positive patients were 68.33% and 31.66%, respectively. The seroprevalence of both HAV and HEV in patients with acute viral hepatitis was 12%. The prevalence of HAV and HEV among males (63.41% and 73%) was higher than in females (36.5% and 27%) and was predominantly seen among young adults. These infections were predominantly seen during end of monsoons and beginning of winter. Conclusion: According to our study the prevalence of HAV is much higher than that of HEV along with co-infection rate of 12% indicates the necessity of screening for HEV which will be of greater importance in pregnant women and improving levels of personal hygiene among higher socio-economic population. Our findings will also helpful for planning of future vaccination strategies and for better sanitation programme in this part of the country.

Key Words: Acute viral hepatitis, co-infection, Hepatitis A Virus, Hepatitis E Virus, prevalence.

INTRODUCTION

Acute viral hepatitis is a major health hazards in developing nations like India with poor sanitary conditions. Viral hepatitis caused by viruses like A & E is a major health problem [1]. Since 1955 several epidemics of hepatitis have been reported. Both hepatitis A (HAV) and hepatitis E (HEV) are highly endemic in India; HEV has been responsible for most of these epidemics [2,3]. In recent years India showing a significant epidemiological shift of HAV infection from high endemicity to intermediate endemicity because of improved sanitary condition and hygiene practices [4]. In most cases of sporadic acute hepatitis and fulminant liver failure in India, 20-50% of patients have been related to infection with HEV. Recently there is an increasing trend in the prevalence of HAV and HEV co-infection [3,5]. The early antibody response in case of HAV is of predominantly of the IgM class and persists for several months. The IgM and IgG classes of antibodies to HEV can be detected but the former falls rapidly after acute infection [6]. Currently serological testing for HEV infection is not available widely. Thereby, this study was done to know the prevalence of HAV and HEV virus mediated acute hepatitis in this region so that appropriate treatment of patients as well as preventive strategies for this part of the country could be suggested.

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MATERIAL AND METHODS

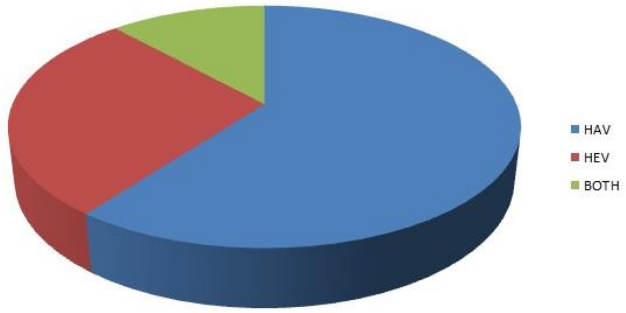
A cross-sectional study involving 180 sera of patients during eleven months period (from February 2012 to January 2013) with clinical and biochemical evidence of acute hepatitis were included. The samples from the hospitalized patients of both sexes and all ages, who did not have a known co-existing illness were only included. Known alcoholic and patients on hepatotoxic drugs were excluded from the study. The serum samples from the selected patients were analyzed for IgM anti HAV and anti HEV for the detection of acute viral hepatitis of A and E respectively using commercially available ELISA kits (Bharat Scientific). The prevalence of hepatitis viruses were analyzed by Fischer's exact test. Two tailed tests were used and a $p<0.05$ was considered statistically significant.

RESULTS

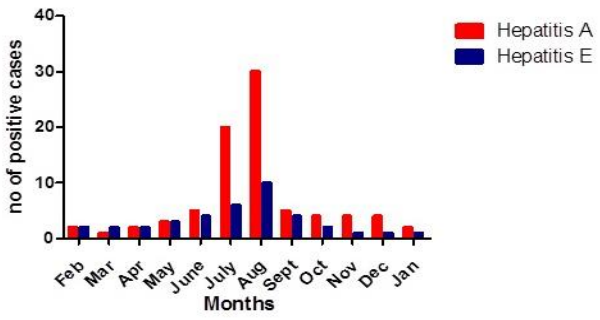
This study was conducted after necessary institutional clearance was obtained for a period of one year. Of 180 cases enrolled in this study, 100 were children and 80 were adults. Male patients (66.6%) outnumbered the female one (33.3%). During the study period total 3 (1.66%) cases developed encephalopathy and were levelled as hepatic encephalopathy. Hepatitis A virus was found in the maximum number of cases 82 (68.33%) followed by Hepatitis E virus (31.66%). Both HAV and HEV virus infection were found in (12%) of cases (Graph-1).

In our study maximum number of HAV infection was found in the age group of 10 to 30 years. Highest prevalence was in the patients with age between 22-26 years. HEV infection was found in all age group and maximum prevalence in the age group of 20-25 years. HAV infection in males and females were found to be 63.41% and 36.5% respectively. In case of HEV infection in males and females were found to be 73% and 27% respectively. Liver function tests were found to be abnormal in all the cases of acute hepatitis included in the study group. Two cases of HEV infection during gestational period had fulminant hepatitis, but no mortality was reported. HAV and HEV seen to prevalent all around the year with maximum cases were seen towards the end of monsoons and beginning of winters (Graph-2).

Graph 1. Pie chart showing seroprevalence of HAV (n=82), HEV (n=38) and both (n=16)



Graph 2. Seasonal distribution of HAV and HEV



DISCUSSION

Multiple studies on HAV and HEV mediated hepatitis from various regions reported varying prevalence of these hepatotropic viruses: HAV (1-67%), and HEV (16-66%).[2,3,7] In the present study, HAV (68.33%) being the most common cause of acute hepatitis followed by HEV (31.66%). The overall prevalence of hepatitis viruses is in accordance with that of other similar studies conducted elsewhere.[5,8] In the current study, 77.7% of cases had a positive viral marker. This finding is more or less similar to the similar study conducted previously. A prevalence of 12 % cases with co-infection of HAV and HEV was detected in our study. Dual infection rate was comparable to another study conducted in South India.[4] Comparing our findings with that of other studies done previously in India show an increased percentage of AVH in adults combined with a decrease percentage in children. With improved socioeconomic conditions and vaccination coverage a shift in the age of acquiring HAV infection has been observed from childhood to older age group globally.

In our study prevalence HEV virus mediated hepatitis was31.66% which is somewhat less than study conducted elsewhere in India [9,10]. Low prevalence of HEV along with an increase of HAV virus prevalence indicates an improvement of living condition of people residing in this region. Some studies have shown an epidemiological trend based upon age specific immunoglobulin G (IgG) levels [10,11]. Our study has a limitation of not studying the IgG levels.

We found that prevalence of HAV was more in comparison to HEV. The lower prevalence of HEV in childhood population may be because of lack of exposure to this virus in children. The HEV infection predominantly affects teenagers and young adults. It may be because of HEV infection is anicteric and goes unnoticed in children. Our findings also agree with the results found with the similar studies [12,13]. Antibodies to HEV were uncommon in children and reached a peak prevalence of 30-40% in early adulthood [13]. Two cases of HEV

infection during third trimester of pregnancy had fulminant hepatitis. We did not find any increase in mortality with HEV infection during pregnancy. This finding may be because of small number of series involved which was noted in other study. Prevalence of both HAV and HEV were higher among males than females which have correlated with other studies [12]. It could be explained by a greater exposure of men in their higher outdoor activity. HAV and HEV were prevalent throughout the year predominance seen towards the end of monsoons and beginning of winter season.

To conclude, AVH caused by both HAV and HEV is a significant health problem in this region of India. Co-infection of hepatitis viruses is not infrequent and presents in many cases. The reduced number of HEV infection rate with an evolving epidemiological shift of hepatitis A infection may be a indicator of improvement of socioeconomic situation in this part of the country. Though the prevalence of HAV is higher than that of HEV but increase chances of fulminant hepatitis due to HEV particularly during pregnancy mandate their routine screening. Clinical suspicion of viral hepatitis should be confirmed by serological tests to detect all the types of causative viruses. Hence, sustain availability of the good quality diagnostic kits should be maintained in health care facility.

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CONFLICT OF INTEREST:

The authors declare that they have no conflict of interest.

STATEMENT OF HUMAN AND ANIMAL RIGHTS

All procedures performed in human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

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