



SEROPREVALENCE OF HEPATITIS A AND E VIRUSES IN PATIENTS PRESENTING WITH ACUTE HEPATITIS AT A TERTIARY CARE HOSPITAL FROM MUMBAI.

Clinical Microbiology

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ABSTRACT

Background: Hepatitis A and Hepatitis E virus (HAV & HEV) are most common causes of acute viral hepatitis occurring sporadically as well in outbreaks and still remains a major public health problem in India. HAV and HEV infections being clinically indistinguishable and with variable outcome, it is important to diagnose these infections early. Hence the present study was undertaken to know the prevalence of HAV, HEV and their coinfection in patients presenting with acute hepatitis. **Methods:** A retrospective analysis of data was done from sera samples received for IgM HAV and IgM HEV in Department of Microbiology of a tertiary care Hospital, Mumbai for one year. The study included 1955 sera samples from all age group from suspected cases of Acute viral hepatitis were tested for IgM anti HAV and IgM anti HEV by commercially available ELISA kits (CTK Biotech, USA). **Results:** The prevalence of HAV was found to be 3% whereas that of HEV was 21.7%. Co-infection with HAV-HEV was seen in only 6 (0.3%) cases. Higher prevalence of HAV was seen in adults than children. Among HEV positive females, 28.4% were ANC. **Conclusion:** The prevalence of HEV was seen more than HAV. The prevalence of HAV as well as HEV was more in adults as compared to children. Therefore improvement of sanitation and hygiene should be stepped up in the population where the prevalence of hepatitis is high.

KEYWORDS

Acute hepatitis, Hepatitis A, Hepatitis E

INTRODUCTION:

Hepatitis A and Hepatitis E virus (HAV & HEV) are most common causes of acute viral hepatitis occurring sporadically as well in outbreaks and still remains a major public health problem in India^[1] HAV and HEV infections pose an epidemiological significance in developing countries like India, because of its spread via faeco-oral route, poor personal hygiene, poor water sanitation.^[2] As per reports, HAV and HEV are responsible for 10-40% of acute hepatitis cases in India.^[1,3]

Globally there is annual burden of 1.5 million cases of Hepatitis A and they have caused approximately 11000 deaths in 2015 (accounting for 0.8% of the mortality).^[4] Incidence of HAV is declining in children due to immunisation and this has led to higher incidence of infection in non-immune adult population.^[5] More than 90% of children and adolescent population in India acquire immunity to HAV by the time they reach preschool.^[6] HAV infection is self-limiting in children, but is symptomatic in adults which may lead to acute fulminant hepatitis and liver failure. A single exposure of HAV infection confers immunity to reinfection.^[7]

Annually, worldwide 3.3 million symptomatic cases of acute hepatitis E are reported with approximately 44000 deaths in 2015 (accounting for 3.3% of the mortality).^[3] In India, 10-50% cases of acute hepatitis and 15-45% cases of acute liver failure are attributed to Hepatitis E virus.^[3,8] HEV infection can cause increased morbidity and mortality in populations at risk which include pregnant women, elderly, patient with chronic liver disease and immunocompromised patients. HEV infection and its prognosis in pregnancy is of major concern in current era. A high case fatality rate averaging around 15-25% in pregnant women, particularly in the third trimester, is a characteristic feature of HEV infection.^[8,9]

HAV and HEV infections being clinically indistinguishable and with variable outcome, it is important to diagnose these infection early. Co-infections are often seen and may alter the course of disease. Hence the present study was undertaken to know the prevalence of HAV, HEV and their coinfection in patients presenting with acute hepatitis.

MATERIALS AND METHODS:

A retrospective analysis of data was done from sera samples received for IgM HAV and IgM HEV in Department of Microbiology of a tertiary care Hospital, Mumbai for one year.

The study included 1955 sera samples from all age group, who were suspected of having Acute viral hepatitis and were tested using IgM

anti HAV and IgM anti HEV by commercially available ELISA kits (CTK Biotech, USA).

Statistical analysis:

The data was entered in excel sheet and the results are expressed as the number of patients (%) for categorical variables.

RESULTS:

Seroprevalence of HAV was 3% (60/1955) and HEV was 21.7% (425/1955). Co-infection with HAV and HEV was seen in 0.3% (6/1955) cases.

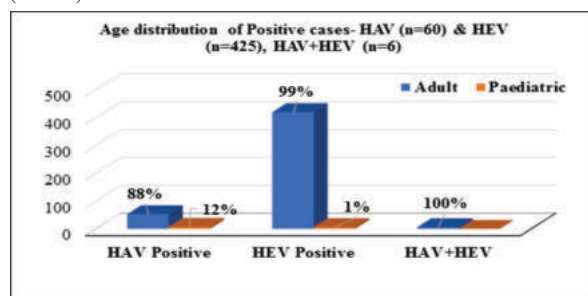


Figure no. 1 Age distribution of HAV & HEV Positive cases

Table No. 1: Gender distribution HAV & HEV positive cases

Group	HAV Positive	HEV Positive	HAV+HEV
Male	45% (27)	50.3% (214)	66.6% (4)
Female	55% (33)	49.6% (211)	33.3% (2)
Total	100% (60)	100% (425)	100% (6)

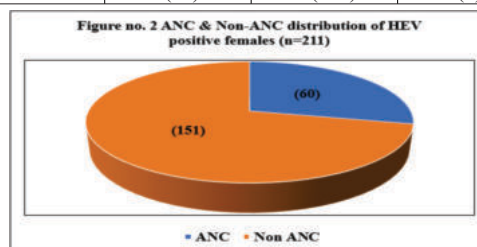


Figure no. 2 Distribution of HEV positive females

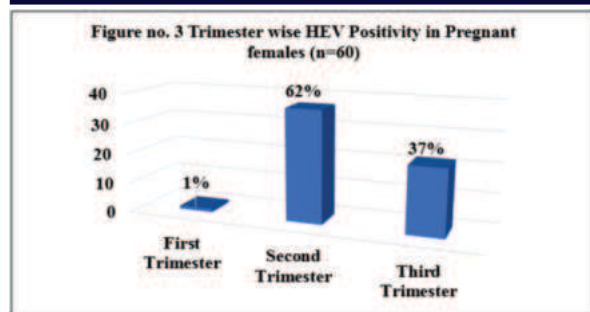


Figure no. 3 Trimester wise HEV Positivity in Pregnant females

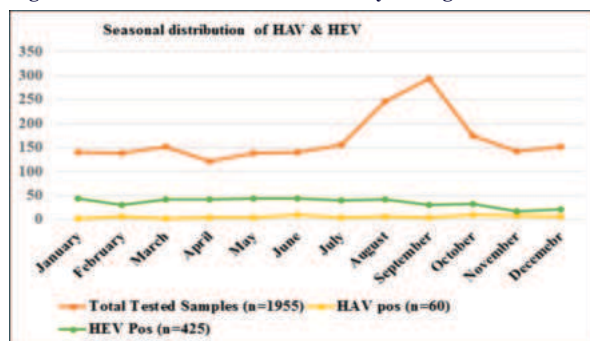


Figure no. 4 Seasonal distribution of HAV & HEV

DISCUSSION:

Viral hepatitis is a global public health problem of epidemic significance especially caused HAV & HEV posing greater risk in developing countries. Both these infections are common in low- and middle-income countries with poor sanitary conditions and hygienic practices; while the infection rates are low in high-income countries with good sanitary and hygienic conditions.^[10,11] Most children (90%) get infected by HAV before the age of 10 years, often without symptoms or as a self-limiting illness.^[7] HEV most commonly infects young adults and can cause severe disease in pregnant women and individuals with pre-existing chronic liver disease. HEV can also lead to chronic hepatitis. India is hyperendemic for HEV, presenting both as outbreaks and sporadic cases.^[12]

The prevalence of HAV in our study is found to be 3% and HEV was 21.7%. In India, various studies have shown seroprevalence of HAV ranging from 6% to 31%. Study done by Jayashri et al showed a prevalence of 6% which is similar to our study.^[13] TM Laxmi et al has reported seroprevalence of HAV, 12.7% in South Indian population, Jain et al from North India 27%, A. Joon et al from Karnataka 19.31%, Sarita et al 31% from Punjab.^[14,15,16,17] Prevalence of HAV in our study is lower than many studies done across India may be due to study population residing in metropolitan region with better sanitary practises. Also various studies have paediatric patients more in the study group and our study has lesser number of paediatric sera samples received for the testing.

Prevalence of HEV in our study is 21.7%, which is similar to other studies conducted in India like 18% by Jain et al^[15], 23.3% Monika Agrawal.^[18] However, prevalence in our study was lower than study by Chandra et al^[19] 38.7% and study by Sarita Rawat et al^[17] 45%; while higher than TM Laxmi study 12.2% and Joon et al study 10.6%.^[14,16] The variation in prevalence could be due to variation in study location, study population, endemicity and sanitation.

In our study HAV and HEV co-infection was found to be 0.3%. Our findings corroborated with the study done by Pandya N et al 0.32% and Chandra et al 1.2% respectively.^[20,19] A. Joon et al^[16] have reported co-infection in 11.5% cases.

This study observed higher seropositivity of both HAV and HEV among adults than in children (Table no. 1) This may be due to majority of study population was from adult age group. Various studies carried out in India have reported higher prevalence of HAV in paediatric population like TM Laxmi et al 48% and Jain et al 39%.^[14,15] Recently few studies like Yashika Bansal et al have reported higher prevalence of HAV in adult population i.e. 37%.^[21] This may be due to the

changing epidemiology of Hepatitis A to non-immune adult population and immunization during childhood.

Joon et al (75%)^[16], and Nidhi S. Chandra et al (98%)^[22] have reported high seropositivity of HEV in adult age group similar to our study. Many studies have reported that antibodies to HEV are uncommon in children. Thus, HEV infection preferentially infects young adults.^[23]

Our study did not observe much difference in seropositivity of HAV and HEV in males and females. (Table no. 1) similar to Chandra et al study.^[19] However, Joon et al, Monoj et al have reported higher male seropositivity which is attributable to exposure of men to profession and social activities.^[16,23]

In present study, a total of 211 females were positive for HEV IgM. (Figure no 2) Out of these, 28% (60) were pregnant females. (Figure No. 2.) MS Khuroo et al, NR Shinde et al and Nidhi et al have reported have reported higher seropositivity in pregnancy i.e 85%, 54%, 40% respectively; while Yashika et al have reported 14% seropositivity.^[9,24,22,21]

Our study observed that majority of pregnant cases presented with acute viral hepatitis were in second trimester of pregnancy 61% while 38% cases presented in third trimester. (Figure No. 3) In MS Khuroo et al study did not observe much difference in 2nd and 3rd trimester seropositivity.^[9]

Various authors have studied the prognosis of HEV during pregnancy and its mortality.^[24,25] Higher mortality is seen in HEV infection occurring in advanced pregnancy.^[9] In Pregnancy due to immunological changes, immunity is suppressed which leads to increased risk of infection or aggravation of present infection. In addition to this increased level of steroid hormones during pregnancy promotes virus replication & growth, predisposing to hepatic dysfunction which ultimately ends in fulminant cases.^[9,24,25] However one of the limitation of our study is; we could not study the prognosis and mortality as this was retrospective analysis of the data.

We did not observe any seasonal variation in sero-positivity of both HAV and HEV, but the number of patients referred for testing was increased from July to October i.e. in monsoon. (Figure no. 4) This could be due acute liver injury involved by other monsoon related illnesses. Joon A et al^[16] have reported peak of HAV in July to October and mild increase in HEV cases from May to July. Chandra NS et al^[19] have reported higher incidence of HEV from March to May.

In our study, prevalence of HEV was relatively higher than HAV. Both the infections were predominantly seen in adult age groups. Due to the similarity in initial clinical presentation and mode of transmission, it is important to differentiate these two infections by testing for HAV and HEV IgM ELISA. HEV infection are increasingly associated with fulminant hepatitis more commonly in pregnant women. The relatively high seroprevalence of HEV also indicates that there is a risk of major outbreaks.

CONCLUSION:

The shift in the epidemiological trend in prevalence of HAV, from children to adult age group, highlights effect of HAV vaccination in children and non-immune adult population. Relatively high prevalence of HEV infections signifies immediate need to identify acute hepatitis cases and confirm the same by specific anti HEV IgM test to arrive at definite diagnosis and reduce complications especially in high risk groups.

The prevalence of HAV and HEV infections is an indirect indicator of the sanitation and hygiene practices followed in the particular area. Thus it is imperative to prevent faecal contamination of drinking water, improve sanitation and hand hygiene practices. These practices are known to decrease the prevalence infection in developed countries.

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