ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 8, Issue, 03, pp. 28673-28676, March, 2016

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

PREVALENCE OF HEPATITIS A & E AMONG SPORADIC CASES OF ACUTE HEPATITIS FROM A TERTIARY CARE HOSPITAL OF WESTERN INDIA

***Sandhya Sawant, Anuja Sonawane and Jayanthi Shastri**

Department of Microbiology, TNMC & BYL Nair Charitable Hospital, Mumbai

ARTICLE INFO

Article History:
Received 28th December, 2015
Received in revised form
20th January, 2016
Accepted 15th February, 2016
Published online 31st March, 2016

Key words:

Hepatitis A,
Hepatitis E,
ELISA.

ABSTRACT

Background: Hepatitis A and E are highly endemic and are significant contributors of morbidity and mortality in India. Retrospective analysis of the data was carried out to find the prevalence of hepatitis A and E virus (HAV & HEV) among the acute sporadic hepatitis patients.
Aim: To find the prevalence of hepatitis A & E among sporadic cases of acute hepatitis from a tertiary care hospital.
Settings and Design: Retrospective study conducted in a tertiary care Hospital
Materials & methods: Data from July 2014 to December 2015 regarding IgM HAV and IgM HEV ELISA was analysed.
Results: Prevalence of HAV infection was 10.6%, HEV was 20 % and HAV & HEV co infection was found to be 5.9 %. Majority of the patients were adults. HEV infection was more commonly seen in females.
Conclusion: HAV continues to be a disease of childhood, age less than 12 years and HEV of older children and adults, age more than 12 years. HEV is a significant contributor of morbidity & mortality among the pregnant patients. It is imperative to prevent faecal contamination of drinking water, improve sanitation, eating and hand hygiene practices. These practices have known to decrease the prevalence in developed countries.

Citation: Sandhya Sawant, Anuja Sonawane and Jayanthi Shastri, 2016. "Prevalence of hepatitis A & E among sporadic cases of acute hepatitis from a tertiary care hospital of western India", *International Journal of Current Research*, 8, (03), 28673-28676.

INTRODUCTION

Communicable diseases are a major public health issue in developing countries including India. Among the communicable diseases, hepatitis A & E virus are responsible for acute viral hepatitis which is common due to overcrowding & poor environmental sanitation conditions. (Jacobsen and Koopman, 2004; Davaalkham *et al*., 2009) Hepatitis A is most common form of acute viral hepatitis (AVH) worldwide, which amounts to approximately 1.4 million cases annually. (Stapleton, 1995) It is caused by hepatitis A virus which is a 27 nm, non-enveloped, single-stranded RNA virus, & belongs to genus hepatovirus of family *Picornaviridae*. Transmission of HAV occurs through faeco-oral route, as well as person-to-person which is limited to close contacts. (Franco, 2012) More than 90% of adolescent & adults & majority of children in India acquire immunity to HAV by the time they reach preschool. (Franco, 2012; World Health Organisation, 2009) Hepatitis A virus cause a self-limiting disease in children, but is symptomatic in adults which may lead to acute fulminant hepatitis & liver failure. (Franco, 2012; Kotwal *et al*., 2014) A single exposure confers immunity to reinfection. (Stapleton, 1995) Hepatitis E is the most common cause of AVH in India. Its prevalence in Southeast Asia is highest and amounts to 60% of global HEV cases. (National Centre for Disease Control, 2014) It is caused by hepatitis E virus which is a spherical 32-34 nm in diameter, non-enveloped, single-stranded, positive sense RNA virus and is the only member in the genus Hepevirus of family Hepeviridae. (Teshale et al., 2011) Transmission of HEV occurs through faeco oral route. HEV is asymptomatic in children, affects mainly older children & adults, causing disease which range from subclinical infection, jaundice to severe fulminant hepatic failure. (Jacobsen and Koopman, 2004; Kotwal *et al*., 2014; Chandra *et al*., 2014; Bashir *et al*., 2009) It can cause increased morbidity & mortality in populations at risk which include pregnant women, elderly, patient with chronic liver disease & immunocompromised patients. (Kotwal *et al*., 2014; Daniel *et al*., 2004; Chandra *et al*., 2010; Lu *et al*., 2001; Kumar *et al*., 2013) Hepatitis A & E, both can occur in sporadic & epidemic forms. (Daniel *et al*., 2004; Chandra *et al*., 2010; Gurav *et al*.,

****Corresponding author: Sandhya Sawant,***
Department of Microbiology, TNMC & BYL Nair Charitable Hospital, Mumbai.

2007) Both viruses have similarities to each other. Both are enterically transmitted viruses, have global distribution & are endemic in India. Outbreaks of HAV & HEV have been reported from Maharashtra & other parts of India, which usually follow heavy rainfall & flooding. (Gurav *et al*., 2007; Nelson *et al*., 2014; World Health Organisation, 2010) The clinical manifestations and the laboratory abnormalities of hepatitis A & E are not distinguishable from that caused by other hepatitis viruses. Morbidity & mortality increases with the coinfection of hepatitis A & E virus & are known to cause prolonged duration of hepatitis, acute liver failure & hepatic encephalopathy. (Lu *et al*., 2001; Arora *et al*., 1996; Shenoy *et al*., 2015) Therefore retrospective analysis of the data was done to detect the prevalence of HAV, HEV infection & their co infection in patients presenting with acute sporadic hepatitis in a tertiary care Hospital in Mumbai, India.

MATERIALS AND METHODS

Our laboratory records were reviewed to collect data from July 2014 to December 2015. Patients of all age group presented with acute hepatitis in whom HAV or HEV was suspected to be the etiology were included in the study. Sera samples were tested for IgM anti HAV & IgM anti HEV for the detection of acute hepatitis A & acute hepatitis E respectively using commercially available solid phase enzyme linked immunosorbent assay (RecombiLISA Manufactured by CTK Biotech). The database was created in MS excel and was analysed.

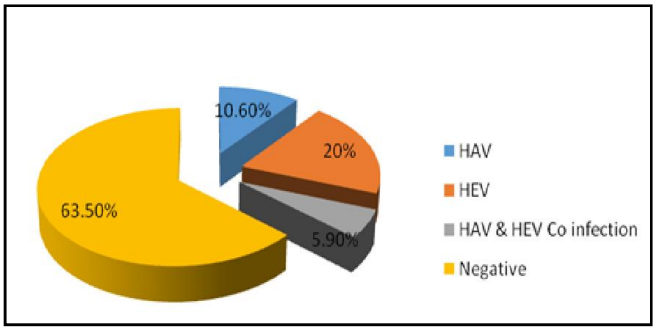

Figure 1. Prevalence of hepatitis A, E & co infection among acute hepatitis patients

RESULTS

A total of 870 samples were tested by IgM ELISA for HAV and HEV throughout this period. 91.95 % (800 / 870 were adults (age more than 12yrs) and 8.05 % (70 / 870) were children (age 12 yrs or less). Out of 800 adult patients, 2.75 % (22 / 800) were cases of jaundice complicating pregnancy. Male to female distribution was 1:1.7 Prevalence of HAV infection was 10.6% (92 / 870), HEV was 20 % (174 / 870) and HAV & HEV co infection was found to be 5.9 % (51/ 870) **Figure 1.** HAV infection was found more in males as compared to females and HEV infection more in females which was statistically significant ($p<0.05$). The age and sex distribution of the HAV, HEV and HAV & HEV co infection is as in **Figure 2 & 3**. Out of 800 adult patients, 8.12% (65/800) were positive for IgM HAV, 21.5 % (172 / 800) for IgM HEV and 6.4% (51 / 800) for HAV & HEV co infection **Figure 2.**

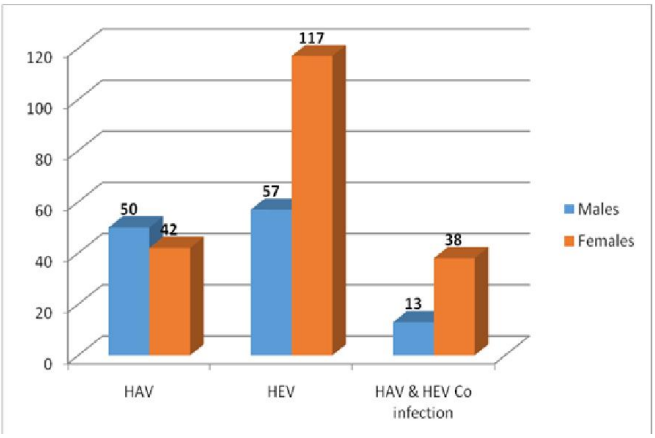

Figure 2. Distribution of HAV, HEV & co infection among male & female

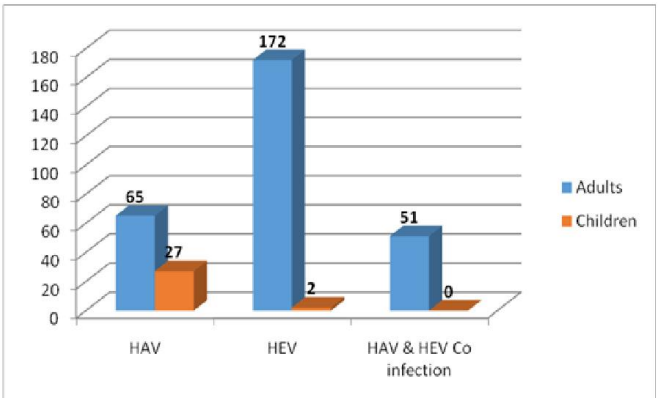

Figure 3. Distribution of HAV, HEV & co infection among Adults and Children

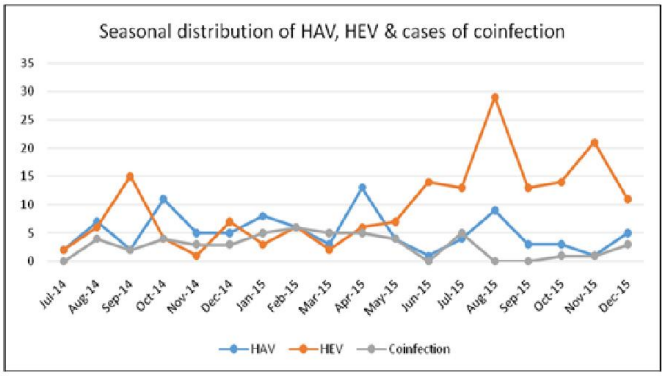

Figure 4. Seasonal distribution of HAV, HEV & cases of co infection

HAV was not detected among the acute hepatitis complicating pregnancy cases. Out of 70 pediatric patients, 38.6 % (27/70) were positive for IgM HAV which was statistically significant ($P<0.05$) and 2.9 % (2 / 70) for IgM HEV. No case of HAV and HEV co infection was seen in children **Figure 3.** A total of 27% (6 / 22) cases of acute hepatitis complicating pregnancy were positive for HEV IgM, out of which two cases had

fulminant HEV followed by a fatal outcome. HAV infection was not seen in pregnant women presenting with hepatitis in our study. Maximum number of HAV cases were reported in October 2014 (12%) & April 2015 (14.3%) whereas number of HEV cases were reported more in September 2014 (8.6%) & August 2015 (16.66%) which was statistically significant ($p<0.05$). **Figure 4**

DISCUSSION

Hepatitis A & E, both are enterically transmitted diseases. We found more than one- third (36.3%) of the patients who presented with acute hepatitis in our tertiary care hospital had evidence of enterically transmitted hepatitis viruses. The positivity rate is similar to the positivity rate found in other studies like Joon *et al*, Lu *et al* and Radhakrishnan *et al*. (Lu *et al*., 2001; Shenoy *et al*., 2015; Radhakrishnan *et al*., 2000) Our study showed a prevalence of HAV infection as 10.6%. Singh *et al*, Naaimi *et al*, Yano *et al*, Laxmi *et al* and Ayoola *et al* reported a prevalence of HAV as 21.7 %, 44.8 %, 36.8 %, 12.7 % and 37 % respectively. (Singh *et al*., 2015; Khaleel, 2012; Yano *et al*., 2010; Lakshmi *et al*., 2011; Ayoola *et al*., 2001) However Chandra *et al* reported a prevalence of 3.1 % which is lower as compared to other studies. (Chandra *et al*., 2012) HEV was prevalent in 20% of patients in our study which is lower than other studies. (Kumar and Saraswat, 2013; Lakshmi *et al*., 2011; Ayoola *et al*., 2001). Co infection rate of HAV & HEV in our study was 5.6%, while it was demonstrated as 11.5% in study by Joon *et al*, 1.2 % by Chandra *et al*, 8.5 % by Lakshmi *et al*. (Shenoy *et al*., 2015; Lakshmi *et al*., 2011; Chandra *et al*., 2012)

A significantly high prevalence of HAV was seen in children HEV was seen in older children & adults. Similar findings were demonstrated by Radhakrishnan *et al*, Singh *et al*, Naaimi *et al* and Ayoola *et al*. (Radhakrishnan *et al*., 2000; Singh *et al*., 2015; Khaleel, 2012; Ayoola *et al*., 2001) HAV & HEV are similar in many ways, the mode of transmission, the clinical manifestation, but still it differs in its age epidemiology. This could be due to the fact that HAV after infection gives a sustained protection against reinfection. Thus prevalence in adults & older children is less, while HEV infection in childhood may be asymptomatic or cause anicteric hepatitis which may go unnoticed and the antibodies to HEV may disappear early, making older children & adults susceptible to reinfection. (Nelson *et al*., 2014) HAV & HEV both did not show any particular seasonal pattern and were prevalent throughout the year, but more number of HAV cases were reported in winters of 2014 & summer of 2015, while more number of HEV cases were reported in the beginning of winter 2014 & monsoon 2015. The rise in number of cases of both HAV & HEV was found to be significant. Floods are known to be responsible for increasing the number of cases and outbreaks of both HAV & HEV due to contamination of drinking water with faeces. Mumbai faced floods during the month of June & July 2015, which was followed by the rising number of HEV cases. Non availability of the clinical information made us unable to correlate the results with the severity & outcomes of the patients, which is the limitation of our study.

CONCLUSION

The prevalence of these two viruses is an indirect indicator of the sanitation & hygiene practices followed in the particular area. Thus, it is imperative to prevent faecal contamination of drinking water, improve sanitation, eating practices & hand hygiene practices. These practices have known to decrease the prevalence in developed countries. The predominance of HEV infection in the whole spectrum of viral hepatitis makes it an important issue for vaccination whenever the same is available in health set up. Also the preventive methodologies aimed towards providing clean drinking water, proper sewage disposal and health education in the form of hand hygiene is of utmost importance.

REFERENCES

Arora, N., Nanda, S., Gulati, S., Ansari, I., Chawla, M., Gupta, S. *et al*. 1996. Acute viral hepatitis types E, A, and B singly and in combination in acute liver failure in children in North India. *J Med Virol.,* 48(3):215-221.

Ayoola, A., Aderoju, A., Gadour, M., Al-Hazmi, M., Hamza, M., Ene, D. *et al*. 2001. Serological profile of sporadic acute viral hepatitis in an area of hyper-endemic hepatitis B virus infection. *The Saudi Journal of Gastroenterology,* 7(3):95-102.

Bashir, K., Hussain, N., Hasnain, S. and Elahi, S. 2009. Seroprevalence of hepatitis E virus immunoglobulin G and M antibodies in adults: A hospital-based study. *Indian Journal of Medical Microbiology,* 27(2):139.

Chandra, N., Ojha, D., Chatterjee, S. and Chattopadhyay, D. 2014. Prevalence of hepatitis E virus infection in West Bengal, India: a hospital-based study. *Journal of Medical Microbiology,* 63(Pt_7):975-980.

Chandra, N., Sharma, A., Malhotra, B. and Rai, R. 2010. Dynamics of HEV viremia, fecal shedding and its relationship with transaminases and antibody response in patients with sporadic acute hepatitis E. *Virology Journal,* 7(1):213.

Chandra, N., Sharma, A., Rai, R. and Malhotra, B. 2012. Contribution of hepatitis E virus in acute sporadic hepatitis in north western India. *Indian journal of Medical Research,* 136(3):477-482.

Daniel, H., Warier, A., Abraham, P. and Sridharan, G. 2004. Agewise exposure rates to hepatitis E virus in a Southern Indian patient population without liver disease. *American Journal of Tropical Medicine & Hygiene,* 71(5):675-678.

Davaalkham, D., Enkhoyun, T., Takahash, M., Nakamura, Y. and Okamoto, H. 2009. Hepatitis A and E Virus Infections among Children in Mongolia. *American Journal of Tropical Medicine & Hygiene,* 81(2):248-251.

Franco, E. 2012. Hepatitis A: Epidemiology and prevention in developing countries. *WJH*, 4(3):68.

Gurav, Y., Kakade, S., Kakade, R., Kadam, Y. and Durgawale, P. 2007. A study of hepatitis E outbreak in rural area of Western Maharashtra. *Indian J Community Med.,* 32(3):182.

Jacobsen, K. Koopman, J. 2004. Declining hepatitis A seroprevalence: a global review and analysis. *Epidemiol Infect*. 132(6):1005-1022.

Khaleel, H. 2012. Predicting acute viral hepatitis serum markers (A and E) in jaundiced patients attending primary health care centers in Baghdad: A one year cross-sectional study. *GJHS,* 4(5).

Kotwal, A., Singh, H., Verma, A., Gupta, R., Jain, S., Sinha, S. *et al*. 2014. A study of Hepatitis A and E virus seropositivity profile amongst young healthy adults in India. *Medical Journal Armed Forces India,* 70(3):225-229.

Kumar, A. and Saraswat, V. 2013. Hepatitis E and Acute-on-Chronic Liver Failure. *Journal of Clinical & Experimental Hepatology,* 3(3):225-230.

Lakshmi, T., Vaithailingam, A., Franklin, A. and Reddy, E. 2011. The prevalence of serological markers of viruses causing acute hepatitis in south Indian population. *International Journal of Biological & Medical Research,* 2(4):925-928.

Lu, J., Zhao, H. and Mong, Q. 2001. Detection of anti-HAV IgM and anti-HEV IgM in patients with sporadic acute hepatitis in Beijing between 1995-2000. Zhonghua Shi Yan He Lin Chuang Bing Du XueZaZhi, 15(2):157-9.

National Centre for Disease Control, 2014. Quarterly Newsletter from the National Centre for Disease Control (NCDC). Delhi: National Centre for Disease Control; 2014 p. Volume 3, Issue 1

Nelson, K., Shih, J., Zhang, J., Zhao, Q., Xia, N., Ticehurst, J. *et al*. 2014. Hepatitis E Vaccine to Prevent Morbidity and Mortality During Epidemics. *Open Forum Infectious Diseases,* 1(3):731-736.

Radhakrishnan, S., Raghuraman, S., Abraham, P., Kurian, G., Chandy, G. and Sridharan, G. 2000. Prevalence of enterically transmitted hepatitis viruses in patients attending a tertary care hospital in South India. *Indian Journal of Pathology & Microbiology,* 43(4):433-436.

Shenoy, S., Baliga, S., Joon, A. and Rao, P. 2015. Prevalence of Hepatitis A virus (HAV) and Hepatitis E virus (HEV) in the patients presenting with acute viral hepatitis. *Indian Journal of Medical Microbiology,* 33(5):102.

Singh, M., Majumdar, M., Thapa, B., Gupta, P., Khurana, J., Budhathoki, B. *et al*. 2015. Molecular characterization of hepatitis A virus strains in a tertiary care health set up in north western India. *Indian J Med Res.,*141(2):213.

Stapleton, J. 1995. Host Immune Response To Hepatitis A Virus. *Journal of Infectious Diseases,* 171(Supplement 1):S9-S14.

Teshale, E. 2011. Hepatitis E: Epidemiology and prevention. *WJH,* 3(12):285.

World Health Organisation, 2009. The Global Prevalence of Hepatitis A Virus Infection & Susceptibility: A Systematic Review. Geneva, Switzerland: WHO Document Production Services.

World Health Organisation, 2010. The Global Prevalence of Hepatitis E Virus Infection and Susceptibility: A systematic review. Geneva, Switzerland: *WHO Document Production Services,* p. 37.

Yano, K., Tamada, Y., Yatsuhashi, H., Komori, A., Abiru, S., Ito, K. *et al*. 2010. Dynamic Epidemiology of Acute Viral Hepatitis in Japan. *Intervirology,* 53(1):70-75.

****