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Seroprevalence of Hepatitis A and E Virus IgM in Children Suffering from Acute Hepatitis

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ABSTRACT

Objective: *Acute viral hepatitis (AVH) in children is a major health problem, among which feco-orally transmitted hepatitis A and hepatitis E are major public health problem in developing countries like India. Their incidence, severity and outcome in small children in central India is not well known*

Methods: *Prospective cross sectional study in which children with acute viral hepatitis were analysed for hepatitis A and hepatitis E IgM by ELISA.*

Results: *A total of 70 patients were included in the study, out of which 11 (15.7%) patients were positive for hepatitis A, whereas 7(10%) patients were positive for hepatitis E and 2 (2.8%) patients were positive for recent infection of both hepatitis A and hepatitis E. Male preponderance was noted.*

Acute liver failure (ALF) was seen more often in HAV infection.

Conclusion: *AVH is a significant problem in central India. Co-infection of hepatitis viruses is not infrequent and detected in many cases.*

Keywords: *Seroprevalence, Viral, Acute Hepatitis, children*

INTRODUCTION

Acute viral hepatitis in children is a major health problem and amongst them the feco-orally spread viral hepatitis A and hepatitis E occur in endemic

and epidemic forms in developing countries including India ^[1]. Hepatitis A virus (HAV) is the most common cause of acute viral hepatitis (AVH) worldwide. HAV is a ubiquitous virus, especially

since it retains its stability in heat and cold, under normal environmental conditions and is highly resistant to external influences [2]. Viral hepatitis is a major public health problem in India; infections are largely acquired through fecal oral transmission. Both HAV and HEV are preventable and highly endemic in India [3]. It is also known that HAV is the predominant cause of acute hepatitis among children and dual infection with HAV and HEV have been more frequently reported among children with acute liver failure (ALF) [4]. Epidemiological data on incidence and prevalence in various parts of Indian including central India is sparse and hence present study was conducted to evaluate the seroprevalance at a tertiary care hospital in Central India.

MATERIALS AND METHODS

Prospective cross sectional study with all patients less than 15 years presenting with acute viral hepatitis in a tertiary care hospital. All patients clinically diagnosed as acute hepatitis (illness less than 15 days) and having elevated bilirubin or alanine transaminase (ALT) > 100 IU/L, presenting in Shri Chaitanya hospital, a tertiary care hospital over a period of one year from Jan 2014 to Dec 2014 were included in the study. Patients who had hepatitis due non infective causes or other aetiologies and pre-existing liver diseases were excluded from the study. Patients who developed signs of encephalopathy following admission were considered as hepatic failure [5].

All the procedures were performed after obtaining written consent and were a part of normally performed workup for that illness. None of the

names were revealed to any out-person taking ethical considerations into account.

Approximately 5 ml blood sample was collected from all cases, serum bilirubin and ALT (Erba transasia) were performed immediately after serum separation; other part of serum was separated and stored at -20°C until further tested. Serum was assessed for anti HAV immunoglobulin M (IgM) (Tulip diagnostic), hepatitis B surface antigen (HBsAg, J mitra), anti HCV total antibodies (J mitra) and anti HEV IgM (Tulip diagnostic). All analyses were performed using commercial kits based on the enzyme-linked immunosorbent assay (ELISA) as per the manufacturer's instructions.

RESULTS

A total of 70 serum samples were obtained from 70 patients. In our study 39 (55.2%) patients were males and 31 (44.8%) females. Male preponderance was noted in our study and there was more distribution of patients at higher age group in children (Shown in Figure 1) in patients presenting with symptoms of hepatitis.

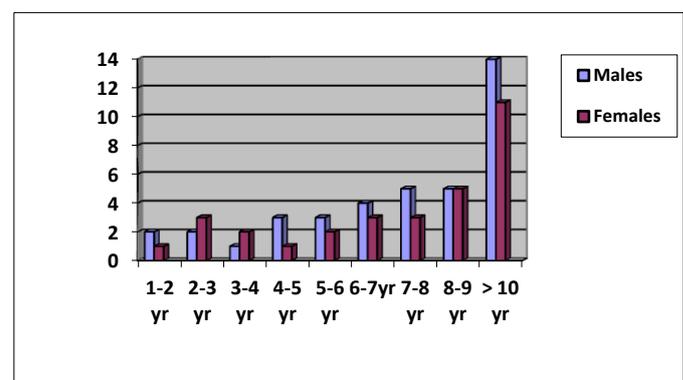


Figure 1 Age and sex distribution of Patients.

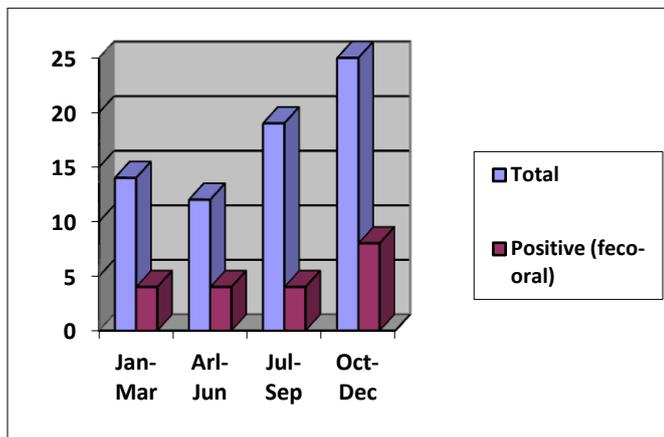


Figure 2 Incidence of cases according to month and season.

The seropositivity of patients with hepatitis A and E and others are shown in table 1 and the patients who developed hepatic failure are shown in table 2.

Table 1: Seropositivity of hepatitis A and E

	No. of male patients	No. of female patients
Hepatitis A IgM Positive	6	5
Hepatitis E IgM Positive	4	3
Positive for Both	2	0
Positive for others (B and C)	6	4

A total of 11 (15.7%) patients were positive for hepatitis A whereas those positive for hepatitis E were 7(10%). Besides this 2 (2.8%) patients were positive for recent infection of both hepatitis A and hepatitis E. Making overall patients with hepatitis A 13(18.6%) and those with positive hepatitis E were 9 (12.8%).

Table 2: Patients with acute liver failure/encephalopathy

	No. Of samples
Hepatitis A IgM Positive	3
Hepatitis E IgM Positive	1
Positive for Both	0
Positive for others (B and C)	2

All patients who were included in the study were icteric, they mostly presented with fever (60%), vomiting (49%), abdominal pain (40%), anorexia (38%), yellow discoloration (21%) and headache (12%).

DISCUSSION

Various studies in different parts of world and different parts of India have repeatedly shown that high rates feco-orally transmitted acute viral hepatitis is still a very important illness, with rates of HAV (3.1-67%) and that of HEV (16.3-66.3%) in children [1-8]. Male preponderance was noted in our study as shown on figure 1, this is in agreement with previous studies [1-8]. Most of the cases occurred in post rainy season from October to December (figure 2); pollution of drinking water and the colder climate in this season is also favourable for the transmission of the virus [8]. In our study, HAV (18.6%) was identified to be the most common cause of acute hepatitis followed by HEV (12.8%); other viruses HBV and HCV infections combined were responsible for 14.2% cases. It was also observed that incidence of HAV was seen to be increasing with higher age in children in our study as shown in figure 1, this is known as epidemiological shift i.e. with

improvement in the socio-economic conditions of the communities, a shift in the age of acquiring HAV infection has been seen from childhood to older age groups in India ^[9] and globally ^[10]. The HEV prevalence in children (12.8%) in our study is lower than that reported by other studies (16.3-66.3%). The lower HEV prevalence along with an indication towards epidemiological shift of HAV suggests an improvement in living standards of the population in central India.

In our study 2 cases were positive for both HAV and HEV infection, it could not be found out whether these were co-infections or super-infections but, it is known that both co-infection and super-infection usually cause complications leading to high morbidity and mortality ^[11].

In our study, children who were suffering from hepatitis A were seen to have a higher incidence (27.2%) of going into ALF and encephalopathy as compared with those positive for hepatitis E (14.2%). Previous studies ^[1-8] conducted in north India have shown a rise in cases of AVH induced by HAV, however no such data is available from central India.

CONCLUSION

AVH still remains a major health problem in children in various parts of Indian including central India. More extensive population based studies are required to determine the underlying causes and prevent these illnesses.

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