JOURNAL OF PURE AND APPLIED MICROBIOLOGY, June 2012. Vol. **6**(2), p. 971-974

Detection of IgM Antibodies to Hepatitis A and E Viruses in Children with Clinically Suspected Infectious Hepatitis

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(Received: 04 October 2011; accepted: 28 November 2011)

Seromarkers of enterically transmitted hepatitis viruses, namely hepatitis A (HAV) and hepatitis E viruses (HEV) were studied in 79 cases with clinically suspected infectious hepatitis attending a tertiary care hospital, Vani Vilasa hospital, Bangalore. Presence of current HAV and HEV infection was ascertained by demonstration of IgM antibodies. Control group comprised of 20 apparently healthy school going children. None were positive for HAV & HEV IgM antibodies. In 79 cases tested for both HAV & HEV IgM antibodies, a total of HAV antibodies was present in 36 (45.6%), the positive rate of anti HAV IgM antibodies was 16 (53.4%) in the age group of 6 to 10 years. The positive rate of anti-HEV IgM antibodies among the study group is 7 (8.9%), The age specific positivity rate of anti-HEV IgM antibodies was 6 (35.3%) in the age group of more than 10 years followed by 1 (3%) in the age group of 6 to 10 years. The positivity rate of both HAV IgM and HEV IgM antibodies among study group is 3 (3.8%).The occurrence of HAV and HEV positive cases did not show a definite seasonal pattern.

Key Words: Hepatitis A virus, Hepatitis E virus, Enterically Transmitted Hepatitis.

Viral hepatitis is a public health problem worldwide. The two enterically transmitted hepatitis, namely hepatitis virus (HAV) and hepatitis E virus (HEV) are endemic in many tropical region[1], where the condition of hygiene and sanitation are poor[2].Viral hepatitis is an important cause of morbidity and mortality, world wide particularly in the tropical countries[3].

HAV infection is endemic in most of the developing the countries including India with frequent out bursts of minor and major out breaks. Epidemic of hepatitis in India are almost exclusively of hepatitis E infections[4]. In Indian subcontinent it accounts 30 to 60% of sporadic hepatitis[5].

In general, hepatitis E resembles hepatitis A, having a similar route of transmission and clinical picture[6]. All the type of hepatitis causes clinically indistinguishable acute illness, their differentiation is based on their *serological* and molecular markers[7,8].

MATERIALS AND METHODS

We received serum sample from 79 patients and control group comprised of 20

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apparently healthy school going children. In this study, patients attending the OPD and admitted to the Paediatrics ward with clinically suspected cases of infectious hepatitis are included in this study.This study was carried out during the period October 2003 to November 2004, at Vani Vilas Hospital Bangalore.

Neonates and infants were excluded from the study group because neonates and infants are exclusively breast fed. History of *hepatoxicity*, anti TB drugs, obstructive jaundice, and hepatitis A and E vaccination were excluded in this study.

3 ml of peripheral blood was collected from both clinically suspected cases of infectious hepatitis and control group. The samples were collected under aseptic precautions. Serum was separated by centrifugation at 3000 rpm for 5 minutes. Separated serum was stored at -70 ^{0}C in the deepfreezer prior to testing.

The test was done accordingly to the manufacture's instructions. HAV IgM antibodies(*Hepanotoka*) and HEV IgM antibodies(Genelabs diagnostic) by *ELISA* Kits. All positives were retested for confirmation.

RESULTS

The total number of 79 cases constituted the study group. Hepatitis A and E positivity was investigated among the children attending the Vani Vilasa hospital presenting with symptoms of viral hepatitis.

The study group consists of 48 (60.8%) males and 31(39.2%) female in age group ranging from 1 to 14 years.

The anti HAV IgM antibodies positivity among the study group is 36 (45.6%). The age specific positivity rate of anti HAV antibodies is 16(53.4%) in age group of 1 to 5 years followed by 16 (50%) in age group 6 to 10 years ,and 4(23.4%) is above 10 years age (table-2).

The positivity rate of anti HEV IgM antibodies among the study group is 7 (8.9%), the age specific positivity rate of anti-HEV IgM is 6

Table 1. The clinically suspected viral hepatitis cases and its Age and sex distribution

Age	Male	Female	Total
1-5	18(60.0)	12(40.0)	30(38.0)
6-10	21(65.6)	11(34.4)	32(40.5)
>10	9(52.9)	8(47.1)	17(21.5)
Total	48(60.8)	31(39.2)	79(100.0)

Table 2. Seropositivity rate of anti-HAV IgM antibodies

Age	Total cases	Positive		
		Male	Female	Total
1-5	30	9(56.3)	7(43.7)	16(44.4)
6-10	32	10(62.5)	6(37.5)	16(44.4)
>10	17	1(25)	3(75)	4(11.2)
Total	79	20(55.6)	16(47.4)	36(100)

Table 3. Seropositivity rate of anti-HEV IgM antibodies

Age	Total cases	Positive		
		Male	Female	Total
1-5	30	0	0	0
6-10	32	1(100)	0	1(143)
>10	17	2(33.3)	4(66.7)	6(87.7)
Total	79	3(42.9)	4(57.1)	7(100)

Table 4. Seropositivity rate of anti-HAV and HEV IgM antibodies

Age	Total cases	Positive		
		Male	Female	Total
1-5	30	0	0	0
6-10	32	1(100)	0	1(33.3)
>10	17	0	2(100.0)	2(66.7)
Total	79	1(33.3)	2(66.7)	3(100)

Table 5. Hepatitis A and Hepatitis E IgM antibodies positivity rate according to seasonal variation

Month	Total cases	HAV(%)	HEV(%)
Feb-May	22	11(50.0)	2(9.1)
Jun-Sep	38	19(50.0)	1(2.6)
Oct-Jan	19	6(31.6)	4(21.0)
Total	79	36(45.6)	7(8.8)

(35.3%) in the age group more than 10 years followed by 1 (3.1%) in the age group 6 to 10 years (table -3)

The 20 control sera obtained from healthy school going children in the age group of 1 to14 years. All were screened for anti -HAV & HEV IgM antibodies. All were found negative.

The 3 patients (0.53%) were positive for dual infection one male and two female (table 4).

The occurrence of HAV & HEV positive cases do not show a definite seasonal variations in this study (table 5)

DISCUSSION

In this study, the anti HAV IgM antibodies positivity rate of 47.3% was observed in less than 12 years age group ,which is almost similar to study by Radhakrishna etal[2] 52.7%.

The present study observed that anti HAV IgM antibodies are 35.5% above 10 years group which is almost similar to those observed by Goldsmith .R.etal 40% [9].

In the present study positive rate of anti-HEV IgM antibodies 8.9% compared to Radhakrishana etal 18 .5 %.

The three patients 0.53% were positive for dual infection one male and two female.

The present study indicates that HEV is more prevalent in and around Bangalore. Further studies are required in this regard.

The present study showed that total hepatitis E IgM antibodies are 8.9% the age specific positivity rate of anti- HEV IgM antibodies in the age group more than 10 years (35.3%) followed by 6-10 years (3.2%). The difference observed is statistically significant ($x^2 = 13.5$, $p = 0.001$).

The presence of these two viruses in the community, as observed in this hospital based study may be obscured due to several reasons. These include the fact that patients are treated in small clinics where alternative medicines are administered. Further the high cost of the test may prevent the request for testing by the clinicians. The limitation of the data strongly argues for the need for community based studies.

This study has shown that HEV infection occurs more often in older children and adults[10]. HAV occurs mostly in children below 12 years because of exposure to HAV occurs in early in life.

The data on the occurrence of HAV and HEV on a monthly basis also shows that 2 viruses are almost throughout the year.

CONCLUSION

HAV infection occurs more often in young children under the age group of 10 years. HEV infection more often in older children. This study shows that exposure to HAV occurs in early life.

The occurrence of HAV & HEV positive cases did not show a definitive seasonal pattern in this study and occurred throughout year. The presence of these viruses did not show any pattern with respect to rainfall. The highest positivity of infection occurs in this reason compare to other study may be because of low standard sanitation which promotes the transmission of HAV and HEV.

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