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Evaluation of Persistence of IgM anti HEV in Patients with Sporadic Hepatitis E Virus Infection

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Abstract : Present study is an evaluation of the persistence of IgM anti HEV in patients with acute sporadic hepatitis E virus infection. This was a prospective study carried out a tertiary care centre. The diagnosis of acute hepatitis E was based on clinical and biochemical parameters and presence of IgM anti HEV antibodies. IgM anti HEV antibodies were detected in sera (stored at -20°C) by ELISA every week till its disappearance. There were 48 patients (38 males and 10 females). The mean age was 32.8 ± 11.3 years (range: 11-64 years). There were 2 children. The mean serum bilirubin level was 8 ± 7.1 mg/dL. Mean ALT and AST levels were 596.7 8 ± 498.7 and 672.5 ± 522.9 IU/L respectively. Serum ALP levels were 410.8 ± 312.5 IU/L. IgM anti HEV could be detected in 35 patients at the end of 1st week of illness, 26 patients in second week, 15 patients at third week, 12 at fourth week, 8 at fifth week, 5 at sixth week and 4 patients at seventh week. The maximum persistence of IgM anti HEV was 45 days. Amongst 48 patients 2 females (non-pregnant) died due to fulminant hepatic failure. An exponential drop of IgM anti-HEV was recorded over weeks with maximum persistence of 45 days after the onset of icterus in acute sporadic hepatitis E patients.

Key words : Hepatitis E virus, IgM, ELISA, ALT, AST

Introduction

Hepatitis E virus is the most frequent cause of acute viral hepatitis in India (Aggarwal and Krawizynski, 2000; Krawizynski *et al.*, 2000; Acharya *et al.*, 2003; Skidmore *et al.*, 1992). In endemic regions, the disease occurs in the form of large epidemic as well as sporadic cases. In epidemics the IgM antibodies were observed to persist from 45 days to 5 months (Somani et al., 2003). The data on the persistence of IgM anti HEV antibodies in sporadic acute hepatitis E is scant. Hence, the present study was undertaken to determine the persistence of IgM anti HEV in patients infected with sporadic acute hepatitis E.

Patients & Methods

This was a prospective study performed at tertiary care centre in Rajasthan. Patients with non-A, non-B, non-C hepatitis attending the OPD and wards of department of Gastroenterology SMS Medical College & Hospital, Jaipur were included in the study. The patients were negative for immunological diagnostic markers IgM anti HAV, IgM anti HBe, anti HCV for hepatitis A, B & C viruses respectively. Diagnosis of acute hepatitis E was based on clinical and biochemical presence of IgM anti HEV. All hepatitis E patients first visited the hospital with in 1 week of icterus. At every follow-up visit, relevant history was

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recorded on a proforma, clinical examination of the patients was carried out. At each hospital visit, blood was collected and serum specimen was stored at -20^0C. All sera specimens were tested for IgM anti HEV using enzyme immunoassay (Biochem, Italy). The study protocol was approved by institution's Ethics committee. All subjects provided informed consent before inclusion in the study.

Statistical analysis was done using Statistical Package for Social Sciences (SPSS, version 10.0). Date was expressed as mean $\pm$ SD.

Result

There were 48 patients (38 males and 10 females). The mean age was 32.8 ± 11.3 years (range: 11-64 years). There were 2 children (both males). Table I shows the age and sex distribution in patients. Patients were diagnosed on the basis of clinical & biochemical analysis. Patients had mean serum Bilirubin level 8.04 $\pm$ 7.12 mg/dl, mean ALT and AST levels were 596.7 8 ± 498.7 and 672.5 ± 522.9 IU/L respectively. Serum ALP levels were 410.8 ± 312.5 IU/L. Table II showed the LFT profile of the patients.

Males 38 (79.16%) were affected more frequently as compared to females 10 (20.83%). Adults (age 21-30 years) were affected more than other age group patients. 2/10 female patients died due to fulminant hepatic failure *i.e.* females showed 4.17% mortality. IgM anti HEV persisted upto 45days after onset of icterus in acute sporadic hepatitis E patients. 35 patients had IgM anti HEV during of 1st week illness and 26 and 12 patients showed positivity to IgM anti HEV during 2nd and 3rd week of illness respectively. Only 4 patients had IgM anti HEV till 7th weeks after onset of icterus. Figure 1 shows the trend of IgM anti HEV percent positivety over weeks. These data suggest that IgM anti HEV decreased exponentially over the weeks in acute sporadic hepatitis E patients.

Discussion

Presence of IgM anti HEV antibodies is considered as an evidence for acute HEV infection (Bradley and Prudy, 1994). Therefore IgM anti HEV should be used for the diagnosis of acute HEV infection. These tests are less expensive, easily performed and widely available (Panda and Acharya 1998; Clayson *et al*., 1997). The data on persistance of IgM anti HEV in sporadic acute hepatitis E patients are sparce (Dawson *et al.*, 1992a). Western data reveal that IgM anti HEV may persist that upto 5 months in epidemic study (Dawson *et al*., 1992b).

An Indian study followed patients in an epidemic upto four weeks and concluded that IgM anti HEV positivity dropped down from 84% in first week to 32% in fourth week. Data from an epidemic in Rajasthan reveals that IgM anti HEV positivity was 80% in first week and 26% at third week and beyond it (unpublished data).

Results of our study demonstrate that IgM anti HEV drops down gradually over week after onset of icterus as IgM anti HEV positivity was 72.9% at first week and 8.3% at seventh week (45 days). IgM anti HEV persisted even after normalisation of alanine aminotransferase which is a well known fact. Our study included small proportion of patients for detection of IgM anti HEV, so further studies on this aspect should be conducted to provide useful insight into the sero-epedimiology of this infection.

In conclusion our data suggest that IgM anti HEV drops down exponentially over weeks in acute sporadic hepatitis E patients.

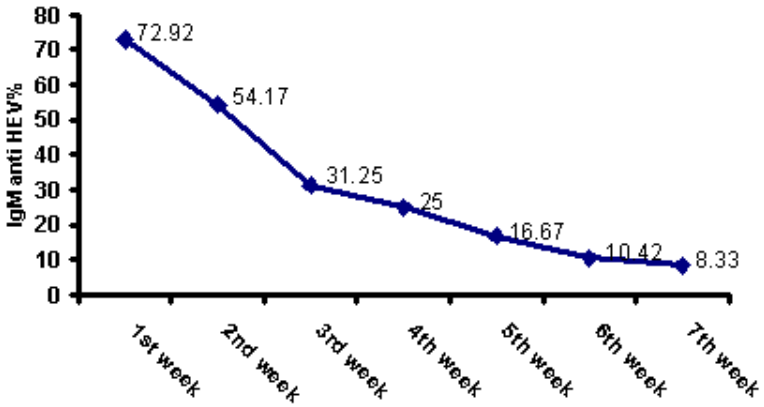
Table 1 : Age & Sex Distribution in acute sporadic Hepatitis E patients (N=48)

Age	Male	Female	Total	IgM anti HEV %
Nov-20	4	0	4	8.33%
21-30	16	1	17	35.42%
31-40	8	7	15	31.25%
41-50	7	2	9	18.75%
51-60	2	0	1	4.17%
61-70	1	0	1	2.08%
Total	38	10	48	

Table 2 : LFT profile in sporadic acute hepatitis E patients (N=48)

LFTs	Range	Mean	SD
Serum Bilirubin	1.1 – 28.1	8.04	± 7.12
SGOT (AST)	25 – 3372	596.78	± 498.74
SGPT (ALT)	36 – 3454	672.58	± 522.94
ALP	90 – 1586	410.83	± 312.59

Fig. 1 : IgM anti HEV in acute hepatitis E patients



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