

Seroprevalence of Hepatitis E in Patients with Chronic Liver Disease from East Azerbaijan, Iran

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Background and Aims: Superinfection with HEV in patients with chronic liver disease (CLD) can cause severe hepatic decompensation leading to increased morbidity and mortality. This study aimed to determine seroprevalence of HEV infection among CLD patients compared to blood donors from Azerbaijan, north-west of Iran.

Methods: CLD patients and a group of age matched blood donors with normal liver function tests were evaluated for the presence of anti-HEV IgG antibody in their sera for evidence of hepatitis E. The risk factors were estimated.

Results: The mean age of CLD patients was 48 years (range: 10-87). 27.5% of patients were HEV IgG-positive. Among the controls 19.7% were positive for anti-HEV IgG. By multivariate analysis, there was no association between positive anti-HEV IgG and etiology of chronic liver disease, gender, literacy, accommodation, and number of family members in patients or controls. Mean age of patients infected with HEV in both groups was significantly more than the seronegative ones.

Conclusions: We found high seroprevalence of HEV-antibody among blood donors and CLD patients in our study, so we recommend more attention to hygiene of food and water. In addition, such patients should be informed about the potential risks and simple ways to prevent the disease in their regular life and travels. This issue must be concerned in cases of "acute on chronic" hepatitis in CLD patients.

Keywords: Hepatitis E, Seroprevalence, Chronic Liver Disease, Azerbaijan

Introduction

Hepatitis E virus (HEV) has been concerned in most epidemics and sporadic cases of viral hepatitis in endemic regions ⁽¹⁾ and is an important public health disquiet in many developing countries of southeast and Central Asia, the Middle East, northern and western parts of Africa, and Mexico, where outbreaks have been reported ^(2, 3). HEV infection is generally a self-limiting illness with low mortality but may predispose chronic liver disease (CLD) patients to severe liver decompensation ⁽⁴⁾.

HEV is the causative agent of both water-borne epidemics and sporadic cases of viral hepatitis in regions with inadequate sanitation. Iran with few suspected outbreaks of HEV ⁽⁵⁾ is expected to have a high chance of hepatitis E occurrence. However, there are few documented studies to explain the statistical characteristics of this infection in the general population, and specific groups of people like CLD patients. We studied the anti-HEV

seropositivity in a group of CLD patients in Tabriz, and compared it to a group of healthy blood donors of the same region.

Materials and Methods

Two hundred patients from Hepatitis Clinic, Tabriz University of Medical Sciences from 2005 to

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2006, diagnosed to have CLD were evaluated for the presence of anti-HEV IgG antibody (DIA-PRO, Italy) in their sera for evidence of hepatitis E. Age-matched subjects attended the center due to other diseases with normal liver function tests (LFT) and negative markers for viral hepatitis were also studied as controls (n=188). 5 ml venous blood samples were taken after interview and physical examination.

Data were collected on patients' age, gender, marital status, number of children, literacy, place of birth, place of living, etiology of liver disease, anti-HEV IgG, viral hepatitis serum markers, and serum protein electrophoresis. Data were analyzed using SPSS 13. Continuous variables were compared using the student's *t*-test. Correlations between nominal variables were analyzed using chi-square test (Fisher's exact where necessary). Potential predictor variables used in the logistic regression analysis included race, etiology of liver disease, age and risk factors for viral hepatitis transmission. $P < 0.05$ was considered significant.

Results

The mean age of CLD patients was 48.26 ± 18.19 years (range: 10-87). More than 50% of these patients were aged between 31 to 60 years (M/F: 125/75). Mean age of controls was 45.54 ± 18.73 years (range: 11-81). The male proportion of controls was 47.9%. No patients had a history of fulminant hepatitis. One hundred and fifty-eight patients had evidence of cirrhosis (79%), based on either a liver biopsy or clinical, laboratory, and radiologic findings. Seroprevalence and etiology of CLD is shown in Table 1.

Fifty-five (27.5%) patients were HEV IgG-positive. Figure 1 shows seroprevalence of HEV in study population according to age groups. Mean level of serum albumin, SGOT and SGPT in cirrhotic patients was 3.7, 69.3 and 54.6 U/L, respectively which was not related to HEV seropositivity. Among the controls, 37 (19.7%) were positive for anti-HEV IgG. The higher prevalence of seropositivity for HEV infection in CLD patients in comparison with that of healthy donors didn't reach the statistical significance.

Mean age of the patients infected with HEV in both groups was significantly more than seronegative subjects ($P < 0.005$). There was a trend toward a higher incidence of HAV in rural inhabitants which didn't reach statistical significance. The mean age and number of family members in seronegative and seropositive patients were almost equal. By multivariate logistic

Table 1. HEV seroprevalence in the patients' subtypes of chronic liver disease, sex and accommodation.

	N	HEV seroprevalence
Male gender	121	29.6%
<i>Cause of chronic liver disease</i>		
Cirrhosis		
Hepatitis B	61	31.1%
Hepatitis C	7	28.6%
Autoimmune	33	18.2%
Cryptogenic	52	30.8%
Primary biliary	4	50.0%
Alcohol	1	100%
<i>Chronic hepatitis</i>		
Hepatitis B	22	18.2%
Hepatitis C	10	30.0%
Autoimmune	6	16.7%
Wilson's disease	4	0%
<i>Accommodation</i>		
Rural	64	39.1%
Urban	136	18.4%

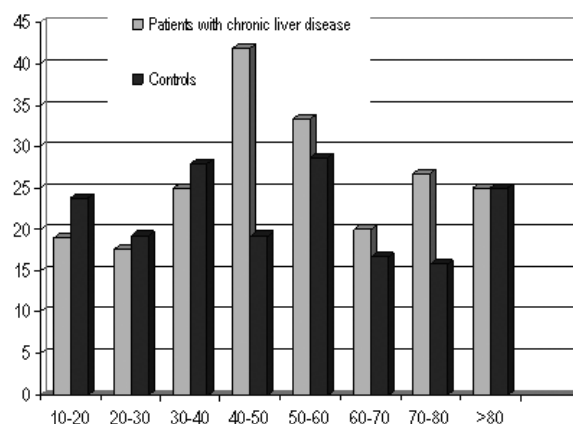


Figure 1. Age distribution of HEV seroprevalence (%) in patients with chronic liver disease compared with controls.

regression, we didn't find any association between positive anti-HEV IgG and etiology of CLD, gender, literacy, accommodation (rural/urban), and number of family members in either patients or controls.

Discussion

Hepatitis E is one of the important hygienic harms in developing countries. There is no previous published epidemiologic data about hepatitis E from north-west of Iran. Here, we studied the anti-HEV seropositivity in a group of healthy blood donors in our region and observed a higher prevalence of HEV seropositivity comparing to other reports from Iran (6). Even though the seroprevalence of HEV was higher among CLD patients, it was not statistically different from that of donors with normal LFT.

Subclinical and inapparent infections may occur; however, chronic infection is unknown. Clinical illness of HEV is similar to other forms of acute viral hepatitis, except in pregnant women in whom illness is particularly severe with a high mortality rate. Recently there are few reports on severe decompensation of chronic liver disease produced by superinfection with HEV (4, 7).

Seroprevalence of HEV infection varies between 1-7% in countries like Australia (8), Germany (9), France (10) and The Netherlands (11). In contrast, the seroprevalence rates in Asia (12-14), Africa (15) and South America (16) are higher and reported to be 5.5% to 71% in various studies. The socio-economic status and sanitary conditions prevailing in the community may explain the major differences in the prevalence patterns seen across the regions. HEV antibody has been reported as 3.8% in Turkey (17), 16.4% in Saudi Arabia blood donors (18) and 17.5% in general population of Pakistan (7); neighbors of Iran. The present study obtained a high prevalence of positive anti-HEV (27.5%) which is close to reports from local countries. Besides, higher prevalence of positive anti-HEV antibody in the third to fifth decennials when the person is more in touch with the community may be a result of recent increase in this enterically transmitted virus spread. The contemporary high prevalence of anti-HEV in CLD patients requires more attention to this group.

It is not completely known how long the anti-HEV antibody persists after exposure. Reported cases of recurrent acute HEV infections (19) suggest that, at least in some patients, the anti-HEV antibody may not persist for a long time. Thus adult population remains vulnerable to acute HEV infection, which, in CLD patients can cause a severe

illness. This group of patients, together with women of childbearing age will benefit from a protective HEV vaccine if this becomes available.

In conclusion, seroprevalence of anti-HEV antibody among blood donors and CLD patients in our study in north-west of Iran is high, especially when compared to a recent study from Tehran, Iran which showed a prevalence of anti-HEV antibody to be 6% in CLD patients and 5% in controls (20). We recommend more attention to hygienic status of food and water. In addition, such patients should be informed about the potential risks and simple ways to prevent the disease in their regular life and travels. This issue must be concerned in cases of "acute on chronic" hepatitis in CLD patients especially in regions with high prevalence.

References

1. Panda SK, Datta R, Kaur J, Zuckerman AJ, Nayak NC. Enterically transmitted non-A, non-B hepatitis: recovery of virus-like particles from an epidemic in south Delhi and transmission studies in rhesus monkeys. *Hepatology* 1989; **10**: 466-72.
2. Viswanathan R. A review of the literature on the epidemiology of infectious hepatitis. *Indian J Med Res* 1957; **45** (Suppl): 145-55.
3. Velazquez O, Stetler HC, Avila C, Ornelas G, Alvarez C, Hadler SC, et al. Epidemic transmission of enterically transmitted non-A, non-B hepatitis in Mexico, 1986-1987. *JAMA* 1990; **263**: 3281-5.
4. Ramachandran J, Eapen CE, Kang G, Abraham P, Hubert DD, Kurian G, et al. Hepatitis E superinfection produces severe decompensation in patients with chronic liver disease. *J Gastroenterol Hepatol* 2004; **19**: 134-8.
5. Ariyegan M, Amini S. Hepatitis E epidemic in Iran. *J Med Council Iran* 1998; **15**: 139-43.
6. Aminiashar S, Alimaghani M, Gachkar L, Yousefi F, Attarchi Z. Anti Hepatitis E Virus Seropositivity in a Group of Blood Donors. *Iran J Public Health* 2004; **33**: 53-6.
7. Hamid SS, Atiq M, Shehzad F, Yasmeen A, Nissa T, Salam A, et al. Hepatitis E virus superinfection in patients with chronic liver disease. *Hepatology* 2002; **36**: 474-8.
8. Moaven L, Van Asten M, Crofts N, Locarnini SA. Seroepidemiology of hepatitis E in selected Australian populations. *J Med Virol* 1995; **45**: 326-30.
9. Trautwein C, Kiral G, Tillmann HL, Witteler H, Michel G, Manns MP. Risk factors and prevalence of hepatitis E in German immigrants from the former Soviet Union. *J Med Virol* 1995; **45**: 429-34.
10. Coursaget P, Depril N, Buisson Y, Molinie C, Roue R. Hepatitis type E in a French population: detection of anti-HEV by a synthetic peptide-based enzyme-linked immunosorbent assay. *Res Virol* 1994; **145**: 51-7.
11. Zaaijer HL, Kok M, Lelie PN, Timmerman RJ, Chau K, van der Pal HJ. Hepatitis E in The Netherlands: imported and endemic. *Lancet* 1993; **341**: 826.
12. Arankalle VA, Tsarev SA, Chadha MS, Alling DW, Emerson SU, Banerjee K, et al. Age-specific prevalence of

- antibodies to hepatitis A and E viruses in Pune, India, 1982 and 1992. *J Infect Dis* 1995; **171**: 447-50.
13. Koshy A, Richards AL, al-Mufti S, Grover S, Shabrawy MA, Pacsa A, *et al*. Acute sporadic hepatitis E in Kuwait. *J Med Virol* 1994; **42**: 405-8.
 14. Tan D, Im SW, Yao JL, Ng MH. Acute sporadic hepatitis E virus infection in southern China. *J Hepatol* 1995; **23**: 239-45.
 15. Grabow WO, Favorov MO, Khudyakova NS, Taylor MB, Fields HA. Hepatitis E seroprevalence in selected individuals in South Africa. *J Med Virol* 1994; **44**: 384-8.
 16. Pujol FH, Favorov MO, Marcano T, Este JA, Magris M, Liprandi F, *et al*. Prevalence of antibodies against hepatitis E virus among urban and rural populations in Venezuela. *J Med Virol* 1994; **42**: 234-6.
 17. Cesur S, Akin K, Dogaroglu I, Birengel S, Balik I. Hepatitis A and hepatitis E seroprevalence in adults in the Ankara area. *Mikrobiyol Bul* 2002; **36**: 79-83.
 18. Abdelaal M, Zawawi TH, al Sobhi E, Jeje O, Gilpin C, Kinsara A, *et al*. Epidemiology of hepatitis E virus in male blood donors in Jeddah, Saudi Arabia. *Ir J Med Sci* 1998; **167**: 94-6.
 19. Ke WM, Tan D, Li JG, Izumi S, Shinji Y, Hotta H, *et al*. Consecutive evaluation of immunoglobulin M and G antibodies against hepatitis E virus. *J Gastroenterol* 1996; **31**: 818-22.
 20. Shavakhi A, Esteghamat F, Sharifian A, Mohamad Alizade A, Khodadostan M, Somi M, *et al*. Evaluation of hepatitis E in cirrhotic patients, a case control study. *Govaresh* 2007; **12**: 27-9.