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Anti Hepatitis E Virus Seropositivity in a Group of Blood Donors

**S Aminiafshar [1], M Alimagham [1], L Gachkar [1], F Yousefi [1], Z Attarchi [2]*

[1]*Dept. of Infectious Diseases and Tropical Medicine, Shaheed Beheshti University of Medical Sciences, Tehran, Iran*
[2]*Tehran Blood Transfusion Center, Iran*

Abstract
Type E hepatitis is caused by an unclassified virus producing acute self-limited hepatitis in different parts of the world. In order to estimate the prevalence of hepatitis E virus seropositivity in Tehran blood donors, a cross– sectional study was performed by the enzyme immunoassay method from 2003 to 2004 in a group of 90 blood donors. We noticed that 7 cases (7.8%) were anti-HEV Ab positive. This figure correlates with the prevalence ratio of endemic parts. There was no association between seropositivity and sex. The commonest age group was 40-49 years. We conclude that Iran can be considered as an endemic area for type E hepatitis (prevalence>5%), and type E hepatitis is more common in Iran than Israel and Turkey, but less common than Saudi Arabia, Iraq and Pakistan; therefore, it should be regarded in the differential diagnosis of acute hepatitis.

Keywords: *Hepatitis E, Blood Donors, Iran*

Introduction

Hepatitis E virus (HEV) is presently unclassified; giving rise to a self limited acute hepatitis. Transmission occurs through oral rout. However, the other routes of transmission have been reported. Infection may produce asymp-tomatic to clinical disease with varying degrees of severity. The fulminate forms of illness were reported in pregnancy (1). Hepatitis E has been one of the common types of adult's acute hepatitis in the hyperendemic parts of Asia, and an important human pathogen in the Central and Southeast Asia, Middle East, and Central and North Africa.

Occasional cases have been encountered in the industrial countries including the United States (2). Infection is considered as water-borne with high probability in the tropical areas where type hepatitis is hyperendemic too (3-5).

Iran is a part of developing Asia with a high incidence and prevalence of type a hepatitis, therefore expected to have a high chance of type E hepatitis occurrence. Unfortunately, there has been no documented study to explain the statistical characteristics of this infection in the general population, and specific groups of people. We studied the level of seropositivity of a group of blood donors in a cross-sectional study in Tehran in 2003-2004.

Materials and Methods

Ninety blood donors were interviewed for any medical problem at present or past and were examined physically to rule out any contra-indication of donation. Blood samples from these donors were tested for hepatitis B, hepatitis C, HIV infections, and syphilis antibodies using a third generation enzyme linked immunosorbent assay and immuno-fluorescent techniques respectively. Anti-HEV IgG and IgM were detected using a HEV test-kit (3rd generation EIA), obtained from Dia Production, Mi-

***Corresponding authors:** Tel: +98 21 2546025, Fax:+98 21 2546026

lano, Italy. The kit uses synthetic antigens copied from ORF2 and ORF3 genes of HEV genome (6). Statistical analyses were performed on phi and x2, and meaningful level was considered a P level less than 0.05 in this cross-sectional study.

Results

The results of the study are shown in the Table 1 and Fig. 1. Table 1 shows the prevalence of anti-HEV positivity in different sex and age groups, and the Fig. 1 shows the frequency of this distribution.

From the ninety blood donors, the age of 14 and sex of 9 cases were not known, and from the rest, 65 (80.2%) were male, and 16 (19.8%) were female. The studied group had an average age of 31.8(±11) years.

Seven out of 90 cases (7.8%) were anti-HEV positive, and this figure was 9.2% for the known age and sex group. The average age of anti-HEV positive cases was 25 years and the antibody was found most frequency in the age group of 40-49 years.

There was not any meaningful difference (*P*=0.1) of seropositivity between age groups of less and more 40 years. Anti-HEV seropositivity was relatively more common in males compared to females with a P value of 0.7 which is not meaningful. Optical density of male groups was 0.19 ± 0.35, and that of females was 0.1 ± 0.07 which is not statistically significant .

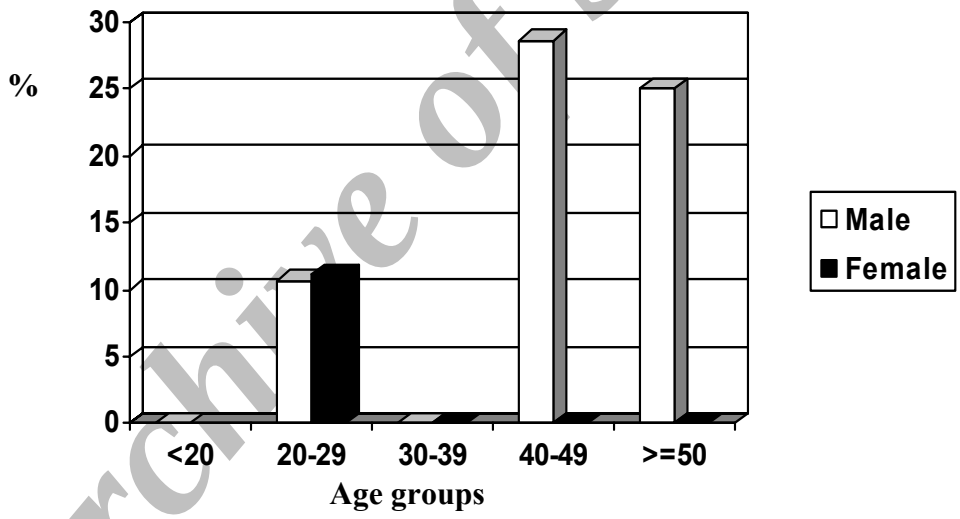

Fig. 1: Frequency distribution of anti HEV soropositivity in association with sex and age in 90 blood donors.

Table 1: Anti HEV seropositivity prevalence in association with sex and age in 90 blood donors

Sex / Age	Male				Female				Total			
	Total	+	-	%+	Total	+	-	%+	Total	+	-	%+
<20	2	0	2	0	0	0	0	-	2	0	2	0
20-29	28	3	25	10.7	9	1	8	11.1	37	4	33	10.8
30-39	20	0	20	0	2	0	2	0	22	0	22	0
40-49	7	2	5	28.6	1	0	1	0	8	2	6	25
>=50	4	1	3	25	3	0	3	0	7	1	6	14.3
Total	61	6	55	9.8	15	1	14	6.7	76	7	69	9.2

Discussion

Type E hepatitis is one of the important hygienic infectious problems of developing countries as like as other oral-fecal transmitted infections and the development of serological methods provided useful clinical and epidemicological information about this infection (7-8).

There has never been any documented study regarding the prevalence and incidence of this infection in Iran.We studied the anti-HEV seropositivity in a group of healthy blood donors in Tehran and noticed a prevalence of more than 5%, which correlates with the prevalence of endemic areas. The obtained value is higher than those obtained in Israel (Jews 2.81% and Arabs 1.81%) (9) and Ankara, Turkey (3.8%) (10), but less than studied values of Iraqis-Kurdish refugees (14.8%) (11), blood donors in Saudi Arabia (16.4) (12) and general population in Pakistan (17.5%) (13). The ratio was more or less similar to the value obtained in a group of healthy blood donors in Riyadh (8.37%) (14).

Our method of screening detected total antibodies (IgM and IgG) while most other methods which were applicated in previous studies detected only anti HEV-IgG antibody. We noticed no sex association of anti-HEV seropositivity which correlates with other studies (15-19).

We found the least amount of seropositivity in the ages less than 40 years, and a peak level in the 40-49 years of age followed by a decline in the higher ages. Most other studies showed the same results (14, 20- 24).

Regarding the seroprevalence study of HEV infection several points must be considered.

1) The degree of HEV excretion by infected people is not very high, which can limit the transmission and distribution of infection.

2) The duration of anti-HEV seropositivity in not well known, therefore the previously infected people might be ignored; however several studies denote a duration of months to years.

3) Sensitivity and specificity of available screening tests may be variable. We applied HEV Ab, Dia. Pro, Milano Italy test kit in our study with a sensitivity of > 98 %(and 100% in 2 studies), and specificity of 99% and accuracy of 99.3%.

According to the results of our study we conclude that Iran is an endemic area of type E hepatitis and we propose higher levels of seropositivity in general population particularly those living in rural areas.

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