Seroepidemiology of Anti-HEV IgG in Healthy Men Blood Donors in Kerman, 2007-2008

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Hepatitis E is an important public health problem in many developing countries. The disease generally affects young adults. The causative agent of Hepatitis E, Hepatitis E virus (HEV), is a single-stranded positive-sense RNA virus without an envelope (1). HEV is generally transmitted by fecal-oral route. The genomic RNA of HEV is about 7.5 kb with three open reading frames (ORFs). ORF1 is predicted to encode viral nonstructural proteins, ORF2 encodes the putative capsid protein, and ORF3 encodes a cytoskeleton-associated phosphoprotein (2, 3). HEV was originally classified as a calicivirus, but recent data showed that HEV does not share some common important features with caliciviruses. It was recently declassified from the Caliciviridae family and remains unclassified (4).

Iran is a part of developing Asia with high incidence and prevalence of type A hepatitis, therefore it is expected to have incidences of Hepatitis E. Unfortunately, there has been no documented study to explain the statistical characteristics of this infection in the general population. We studied the level of seropositivity of a group of blood donors in a cross-sectional study in Kerman during 2007-2008 (5).

Among the 400 plasma samples analyzed, a total of 31 were found to be positive for anti-HEV IgG, corresponding to a prevalence rate of 7.7%, however, no significant difference was observed (P = 0.45).

No data on type of job activities of the donors were available, but it was interested to know whether some of them had occupations involved in animal contacts. Another possibility is that sanitation may play a more prominent role in urban than rural areas. None of the positive donors had recently traveled to the endemic regions, but they might have traveled outside Kerman long time ago and

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Fig. 1: Frequency distribution of anti HEV seropositivity in association with age in 400 men blood donors.
be exposed to HEV. Thus, it is not possible
to conclude that HEV was acquired locally.
Hepatitis E is observed in young adults in our
endemic regions while in industrialized
countries, HEV seems to be more frequent in
older adults. To characterize this
epidemiological feature of HEV infection in
Kerman, the data of four different age groups
were analyzed: 20-30, 30-40, 40-50 and 50-60
years old of age (Figure1 and 2). Figure1
shows the prevalence of anti-HEV positivity in
different age groups, and the Fig. 2 shows the
frequency of this distribution. Table 1 also
shows Age-specific prevalence of hepatitis E
virus (HEV) IgG antibodies in subjects from
rural and urban area. Thus, the probability of
exposure to HEV seems to increase with age.
The overall prevalence of anti-HEV antibodies
among our blood donors was 7.4%, which is
generally higher than figures reported from
developed countries (0.4% to 3.9%) (6, 7), and
lower than those from other countries of the
Eastern Mediterranean Region (52%).
The obtained value is higher than those
obtained in Israel (Jews 2.81% and Arabs
1.81%) and Ankara, Turkey (3.8%), but less
than studied values of Iraqis-Kurdish refugees
(14.8%), blood donors in Saudi Arabia (16.4%)
and general population in Pakistan (17.5%).
The ratio was more or less similar to the value
obtained in a group of healthy blood donors in
Riyadh (8.37%) (5).
There are no published study regarding the
prevalence and incidence of HEV infection in
Kerman. We studied anti-HEV seropositivity
in a group of healthy blood donors in Kerman
and noticed a prevalence of more than 7.4%,
which correlates with the prevalence of endemic areas.

![Image](image.png)

Table 1: Age-specific prevalence of hepatitis E virus (HEV) IgG antibodies in subjects from rural and urban area

<table>
<thead>
<tr>
<th>Age group(years)</th>
<th>Urban area no.pos./no.test.(%)</th>
<th>Rural area no.pos./no.test.(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-30</td>
<td>3/98(3%)</td>
<td>0/37(0%)</td>
</tr>
<tr>
<td>30-40</td>
<td>4/123(3.2%)</td>
<td>3/22(13.6%)</td>
</tr>
<tr>
<td>40-50</td>
<td>9/80(11.8%)</td>
<td>5/15(33.3%)</td>
</tr>
<tr>
<td>50-60</td>
<td>5/23(21.7%)</td>
<td>2/2(100%)</td>
</tr>
<tr>
<td>Total</td>
<td>21/324(6.4%)</td>
<td>10/76(13.1%)</td>
</tr>
</tbody>
</table>

Our method of screening detected anti HEV
IgG, which is a routine test to detect HEV
infection. No significant difference was
observed in seropositivity between males and
females. The lowest rate of seropositivity was
observed in less than 20-30 years, and a peak
level in the 30-40 years of age followed by a
decline in the higher ages. Our data correlates
to most other studies.

Since the HEV excretion is not usual,
transmission rate and prevalence of the
infection is low.
According to the results of our study we
conclude that Kerman is an endemic area of
type E hepatitis and we suggest further
investigation since there will be higher
incidence of the infection in general population
particularly in rural areas.
Determination of anti-HEV in healthy blood
donors is not routine now. The available kits
to detect anti-HEV IgM have some limitations.
Although the HEV-specific polymerase chain
reaction (PCR) test is sensitive and specific,
screening of the blood using PCR would not be
cost-effective. In conclusion, seroprevalence of
the HEV among blood donors in our study in
Kerman is high, but we cannot recommend
screening of all blood donors for HEV until
more data becomes available and further
knowledge about the mode of transmission of
HEV becomes available.

References

1. Meng XJ, Wiseman B, Elvinger F, Guenette
DK, Toth TE, Engle RE, et al. Prevalence of
antibodies to hepatitis E virus in veterinarians
working with swine and in normal blood
donors in the United States and other countries.


