

Anti-Hepatitis E Virus seroprevalence in pregnant women, in Gorgan, Iran, North East of Caspian Sea

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Abstract—Introduction: Hepatitis E virus can cause a self limited hepatitis in adult age 17-45 years. It disseminates oral-fecal and its fulminated form can lead to a mortality rate of about 25% in second and third trimesters of pregnancy. This study aimed to assess the seroepidemiology of HEV in pregnant women in Gorgan, Iran North East of Caspian Sea. In this cross-sectional descriptive study, 394 pregnant women ages 15-47 years old were recruited. Demographic data was recorded in the checklists and a blood sample was taken. ELISA method (DIA.pro-Italy) was done to evaluate the anti-HEV total antibody. Data were entered into SPSS software. Chi-square, fisher and T-test were used to analyze data. Among the studied subjects, 7/36% had anti-HEV antibody. Age, level of education, gestational age and number of pregnancy, had significant relationship with HEV infection. According to the results it seems prevalence of HEV in our region is lower than endemic area and more researches in pregnant women especially in trimester two of pregnancy are needed.

Keywords: Hepatitis E, Seroprevalence, Pregnant women, Gorgan, Iran

I. INTRODUCTION:

Hepatitis E virus [HEV] is an only serotype and species of Hepevirus genus in family of Hepeviridae. It is a non-enveloped, spherical shape virus with a linear positive sense single stranded RNA genome. HEV is one of the important causes of acute hepatitis in developing countries and is becoming as an emerging infection disease. Severity of its infection may range from unapparent to fulminant hepatitis. HEV infection is categorized as an acute and self-limited disease and its transmission route is through fecal-oral way. It may cause waterborne epidemics, which have been reported from many countries. Zoonotic spread of HEV may happen by swine or other wild and domestic animals through close contact or uncooked meat consumption. Transmission through mother to infants and rarely by blood is shown [1, 2, 3 and 4].

This infection has been cleared to be endemic and epidemic in Central and southeast of Asia, Middle East, North and West of Africa, Mexico and Brazil. India and its surrounded regions are predominant for infection with HEV and travelers to this area are at risk of infection [2]. Sporadic

infection has been reported in developed countries however instead of prevalence of disease in developing area prevalence of anti HEV antibody is worldwide [4]. Over all, prevalence of anti HEV antibody in developing countries ranged between 20% and 40% in compare with industrialized countries with 1% to less than 20% [1, 7]. Rate of death in general during HEV infection is less than 4% that can reach to 25% in pregnant women [5, 6]. Prevalence of HEV antibody in our country was reported range from 2.3% to about 10% [8]. Mortality of this infection in general population is about 1-2% that dramatically increasing to 20-30% in pregnant women [9]. For diagnosis, ELISA is available for detection of IgM and IgG antibodies against HEV that is specific for recent or ongoing infection [10]. Furthermore, viral detection can be done by RT-PCR. Present study was conducted in North West of Caspian Sea in Iran to investigate prevalence and risk factors for HEV infection in pregnant women who has been referred to Dezyani hospital in Gorgan.

II. MATERIAL AND METHODS:

In this cross-sectional descriptive study, during 2010, 394 pregnant women ages between 15 and 47 years old who were recruited to Dezyani hospital entered. Demographic data and specifically, data on age, race or ethnicity, education level, birth location, home location as urban or rural, trimester of pregnancy, number of birth and more was recorded in the checklists.

Blood sample was taken and aliquots of serum were shipped on ice to virology diagnostic laboratory of University of Golestan Medical Sciences and kept in -20°C till anti-HEV testing. Samples were tested for total anti-HEV by a commercial [DIA.pro-Italy] enzyme immunoassay [ELISA]. Data were entered into SPSS software. Chi-square, fisher and T-test were used to analyze data.

III. RESULTS:

Total of 354 pregnant women were assayed against HEV total antibody. Of these 29 [7.4%] cases showed anti HEV antibody. Median age of HEV positive women were 29.69 years in compare with 26.10 years for HEV negative persons. It was showing significant differences [P=0.001] and demonstrated that rate of infection was higher in older women. Also our findings was revealed significant relation between HEV seropositivity and education level [P=0.007]

and lower educated women showed higher seropositivity to HEV [Table 1]. Significant relation also could be seen between trimester of pregnancy and HEV antibody positivity [P=0.013] demonstrating that highest rate of anti HEV was obtained in second trimester [Table 2]. Parity had significant relation with seropositivity to HEV and lowest rate of infection were seen in their first pregnancy experience [P=0.015]. Our data did not show any significant relation between infection with HEV and living in rural or urban area, family number as well as unsuccessful pregnancy.

IV. DISCUSSION:

Hepatitis E is an emerging infection and a major cause of acute and endemic hepatitis in the world especially in undeveloped countries. Significant morbidity and mortality are seen in pregnant women [4]. This study provides rate of anti-HEV seroprevalence [7.36%] among pregnant women in Gorgan, North East of Caspian Sea. These results suggest low prevalence of HEV infection in this area in compare with endemic area [11] and is comparable with other findings in Iran [8]. Instead of big differences in rate of HEV antibody between this study and our neighbor eastern countries studies such as Pakistan, Nepal (about 20%), this is similar to our western countries studies such as Turkey (8%) [11, 12, 13]. In the past there has been an idea that HEV infects more pregnant women than others based on earlier report but later studies demonstrated that prevalence of HEV infection is not actually different between pregnant and non-pregnant cases [11, 14, 15]. This is proved by this study that distribution of anti HEV antibody in pregnant and non-pregnant child bearing age women (6.7%) in our region is similar [8]. According to our results, age (P=0.001), lower education (P=0.007), trimester of pregnancy (P=0.013) and number of pregnancy (P=0.015) seems to be risk factors affecting HEV infection prevalence. As HEV infection occurs primarily in adults but it has been shown in young and middle age groups as well. Some studies showed that despite of the fact that children were generally asymptomatic but children (0–2 years of age) were at a higher risk of dying from hepatitis E infection [16]. Our finding showed higher risk factor of age in elder people. Next result that is comparable in most of studies [11] demonstrated role of education in decline of HEV seroprevalence, and prevalence of hepatitis E in educated women is significantly low. It seems education is one of the most important ways for infection prevention and can reduce rate of fecal-oral transmission of hepatitis E as well as other enteric pathogens. Interesting area of HEV infection is its relation with pregnancy and consequence of disease. Pregnant women, particularly in second and third trimesters are more affected with high rate of morbidity and mortality. Our findings demonstrated higher seropositivity of HEV in pregnant women in second trimester significantly and are comparable with many studies [7, 17, 18 and 19]. Instead of most of studies that revealed risk factor of living in rural area for HEV seropositivity, our results did not show any significant relation between residency in rural and urban area. It could be due to improvement in standard of living and sanitation [9, 20 and 21].

In conclusion HEV infection has only recently been recognized as a distinct entity, and is a common cause of acute hepatitis around the world. Most cases of HEV infection are a self-limited illness, and groups of at risk dealing with severe disease and even potential for chronicity. Surveillance of this infection and study for vaccine against HEV infection to prevent significant disease in endemic area is suggested.

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TABLE 1: ANTI HEV SEROPOSITIVITY AND EDUCATION IN PREGNANT WOMEN

Level of education	Anti HEV		Total (percent)
	Positive (percent)	Negative (percent)	
Non and low educated	23 (5.84)	217 (55.08)	240 (60.92)
Educated	6 (1.52)	148 (37.56)	154 (39.08)
Total (percent)	29 (7.36)	365 (92.64)	394 (100)

TABLE 2: ANTI HEV SEROPOSITIVITY IN TRIMESTER OF PREGNANCY

variants		Anti HEV		Total (percent)
		Positive (percent)	Negative (percent)	
Trimester	first	3 (8.8)	31 (92.2)	34 (8.7)
	Second	4 (26.6)	11 (73.4)	15 (3.8)
	Third	22 (6.4)	320 (93.6)	342 (87.5)
	total	29 (7.41)	365 (92.59)	391 (100)