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THE SEROPREVALENCEOF HEPATITIS A IN TEHRAN POPULATION IN 2016

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ABSTRACT

Introduction:Viral hepatitis is one of the most important health problems in the world. Although the infection with hepatitis A virus (HAV) is a disease that is limited and improved after a while, but it is one of the major causes of outbreaks and mortality. The aim of this study was to evaluate the seroprevalence of Hepatitis A in Tehran population.
Materials &Methods:This was a cross-sectional study on theserum samples from patients referred tothree hospitals (Mofid,Loqmanand Imam-Hossein) and one private center (samples for subjects over 30 years of age) in Tehran in 2016. Anti-hepatitis A antibody in serum samples was assessed by ELISA with a special kit according to the manufacturer's instructionsand the results were compared based on the subgroups of baseline characteristics. The collected data were analyzed by SPSS-18 using chi-square test and logistic regression.
Results:Of 831 people, 42.2% were females and 57.8% were males. The mean age was 15.9 ± 13.0 years. Anti-hepatitis A antibody was positive in 319 patients (38.0%) and negative in 512 patients (61.0%). There was not any difference between sex groups (P=0.487), but seropositivitywas higher in patients older than 30 years and lower in patients below 5 years old (P<0.001). The difference between three independent variables of age group, health status and socioeconomic status was statistically significant (P< 0.001).
Conclusions:The results of this study showed that a higher prevalence of HAV seropositivity was seen in older people with lower socioeconomic and health status.

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Introduction

Viral hepatitis is one of the most important health problems in the world, affecting hundreds of millions of people [1]. Although the infection with hepatitis A virus (HAV) is a disease that is limited and improved after a while, but it is one of the major causes of outbreaks and mortality. The disease may be asymptomatic in children under the age of 5 years or with mild non-specific symptoms, and these asymptomatic patients can cause other family members to become infected with the release of the virus a few weeks through the feces [2,3]. For this reason, in developing countries such as Iran, it is thought that most Iranian adults are likely to be immune to this disease without knowing the history of the disease. On the other hand, the spread of this disease is associated with population growth, poor health, and the lack of proper disposal of sewage. Nowadays, with the improvement of the health in the world, the disease is decreasing worldwide [3,4]. Studies on HAV in Iran are limited, but these studies also indicate that HAV is endemic at least in some Iranian cities [5].

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According to the WHO report, Iran is an endemic area for HAV, with a high prevalence of this infection that previous studies on the prevalence of HAV among different populations in the country confirmed it. However, the data obtained in recent reports indicate that infections in children are lower than other age groups [4,6].

In the studies conducted in different regions of Iran such as Tehran, Golestan and Hormozgan, high frequencies of anti-hepatitis A antibodies were reported, which were 85%, 99% and 96%, respectively [7]. The results of a large survey in Iran showed that 95% of blood donors had anti-hepatitis A antibodies. However, over the past few decades, Iran has substantially improved the standard of quality of life and public health in rural and even distant areas [7,8].

As in developing countries, endemic infection with this virus occurs in the younger ages, most infections are not clinically detectable and often do not have high morbidity in these ages [9]. By improving the health of communities, delayed infection occurs with the virus, therefore, the infection in older ages also has a higher morbidity [9,10]. Infection with this virus is one of the causes of long-term absence of children and adolescents from the school and occasionally causes more serious complications, including acute liver failure, hepatic encephalopathy and even death. Anti-hepatitis A vaccine as a prevention method before exposure requires an extensive planning and imposes a high cost on the health budget of the country. Immunoglobulin use, especially in post-exposure cases, is recommended for short-term protection. However, due to its low availability and its relatively higher cost, recognizing high-risk groups in the community and prescribing it is only recommended after contact periodically [11].

Given that the HAV is a major cause of viral hepatitis and can cause hepatic complications especially in adulthood, as well as infection at an early age without clinical symptoms, therefore, it is necessary to obtain new statistics on the prevalence of the HAV for the necessary health-care planning. In this way, it is possible to reduce the morbidity and serious complications of hepatitis A virus during adulthood and can promote the life expectancy and health of the community. In this regard, the aim of this study was to investigate the seroprevalence of HAV in the population of Tehran (capital of Iran).

Materials & Methods

Subjects

This was a cross-sectional study on theserum samples from patients referred tothree hospitals (Mofid,Loqman and Imam-Hossein) with good, moderate and bad socioeconomic status, respectively, and one private center (samples for subjects over 30 years of age) in Tehran in 2016. If there was a diagnosis of any immunodeficiency deficiency, the blood sample was excluded from the study.

Data Collection

In this study, the eligible subjectsreferred to the three hospitals and one private center in Tehran were investigated. Achecklist includeddemographic characteristics such as age, sex, personal and public health, economic status, dwelling place, and history of vaccinationwas completed for each patient after obtaining informed written consent.The serological samples from the mentioned centers were collected, and then, were divided into 5 age groups of 0-5 years, 5-10 years, 10-15 years, 15-30 years, and over 30 years old, as well as in two male and female sex groups. The blood samples were frozen at -20 °C after serum separation and anti-hepatitis A antibody was assessed by ELISA with a special kit (DIA-PRO, Italy) according to the manufacturer's instructionsand the results were compared in subgroups of baseline characteristics.

The study protocol was approved by Ethics Committee of ShahidBeheshti University of Medical Sciences and all patients' data will be remained confidentially.

Statistics

The collected data were analyzed using SPSS-18 statistical software. The median, mean and standard deviation were used to describe the data. To determine the significance of the difference between the qualitative variables, chi-squaretest was used. In the analytical report, logistic regression (simple and multiple) was used. The significance level for all tests was considered 0.05.

Results

A total of 831subjects were studied that the mean age was 15.9 ± 13.0 years (median = 11, range = 0.08 - 94).Anti-hepatitis A antibody was positive in 319 patients (38.0%) and negative in 512 patients (61.0%). Baseline characteristics of patients have been shown in Table 1.

Table 1. Baseline characteristics of study subjects

Characteristics	Subgroup	Frequency (n)	Percentage (%)
Age (y)	≤ 5	184	22
	6-10	211	25
	11-15	118	14
	16-30	182	21
	> 30	136	16
Sex	Male	480	58
	Female	351	42
Vaccination	Yes	831	100
	No	0	0
Socioeconomic status	Good	307	36
	Moderate	408	59
	Bad	116	14
Health status	Good	657	79
	Moderate	170	20.45
	Bad	4	0.05

There was no significant difference in the HAV seropositivityin terms of sex, so that in patients with positive serology, 134 patients (42%) were females and 185 subjects (58%) were males, while in those with negative serology, 217 patients (42.4%) were females and 295 of them (57.6%) were males (P = 0.487). Fifty patients (16.3%) with good socioeconomic status, 168 subjects (41.2%) with moderate status and 101 subjects (87.1%) with bad status had positive HAV serology that the difference was statistically significant (P<0.001).One hundred and eighty-seven patients (28.5%) with good health status, 128 patients (75.3%) with moderate status and 4 patients (100%) with bad status had positive HAV serology that the difference was statistically significant (P< 0.001). The mean age for those who had a positive serology was 23.50 ± 14.83 years and in patients with negative serology was 11.17 ± 8.94 years that the difference was statistically significant (P< 0.001). Also, in the age groups, the most cases with positive serology were observed in patients over the age of 30 years (79.4%), and in the age group of 16-30 years, 49.5% of patients, 15-11 years, 30.5% of cases, and 6-10 years old, 25.6% of subjects had positive serology and the lowest cases were seen in subjects under 5 years old (16.8%) that the difference between the age groups was statistically significant (P< 0.001).

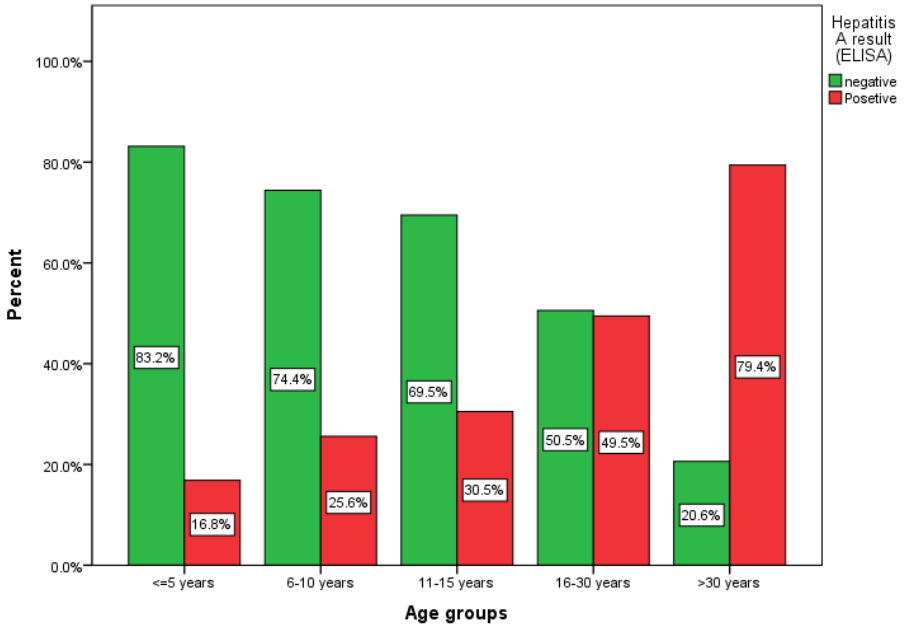
To evaluate the confounder effect, three independent variables of age group, health status and socioeconomic status were compared and the difference between these variables was statistically significant (P< 0.001). Therefore, each of these variables separately affected the positive HAV serology.The results of the comparison of cases with positive HAV serology based on the patient's baseline characteristicshave been shown in Figures1-4.

Discussion

Although HAV infection is one of the most common infectious diseases worldwide, it can still be prevented by vaccine [12], that's why the incidence of the disease has declined due to the use of vaccine in some countries [13]. Improvement of health and environmental conditions is also one of the other causes for the reduction of the disease [14]. In this study, serologic investigation of the disease in several centers in Tehran showed that 38.4% of the cases had HAV seropositivity. In the study of Ehsani et al. by investigating 1018 children aged 6 months to 15 years in 2002, the prevalence of HAV seropositivity was 22.3% that the highest rate was in the 10 to 15 year old population (25.9%) [15]. In the present study, the highest prevalence was in subjects over the age of 30 years (79%). In the Ehsani's study, there was no statistically significant difference between age and sex groups. Also, in the present study, there were no significant differences between sex groups, but among the age groups, this difference was statistically significant and with increasing age, the HAV seropositivity was increased and the lowest seropositivity was observed in children under the age of 5 years. Of course, with the increase in age, the risk of the disease and as a result of seropositivity increases. In the present study, subjects over the age of 30 years were also evaluated that the seroprevalence rate was higher, so that in comparison of age groups, the highest seroprevalence was found in patients over the age of 30 (79.4%).

Some studies in Iran have suggested the need for Anti-HAV vaccination. A report by Marat et al. indicated that the prevalence of this disease in Iran is increasing [7]. Mehr et al. also pointed out that the prevalence of this infection varies in different regions of Iran, and they proposed the strategy of vaccination or post-exposure prophylaxis [16]. Of course, Saffar et al. had different opinions and did not recommend vaccination; in their study in Sari (north of Iran), the people under the age of 5 years was considered as the population at risk, and the reason for not recommending vaccination in their study was a high prevalence of natural immunity against HAV, and according to their ideas, vaccination was not cost effective [17]. Of course, based on the results of the present study and Ehsani's study [15], seroprevalence rate increases with rising age, and on the other hand, the severity of the disease increases with increasing age, which also necessitates the need for care strategies at older ages.Studies in other countries are epidemiologically different, although some studies have recommended vaccination, including the study of Kim et al. in Korea [18] and the study of Marcus et al. in Brazil [19].

Figure



1.Comparison of cases with positive HAV serology by age groups

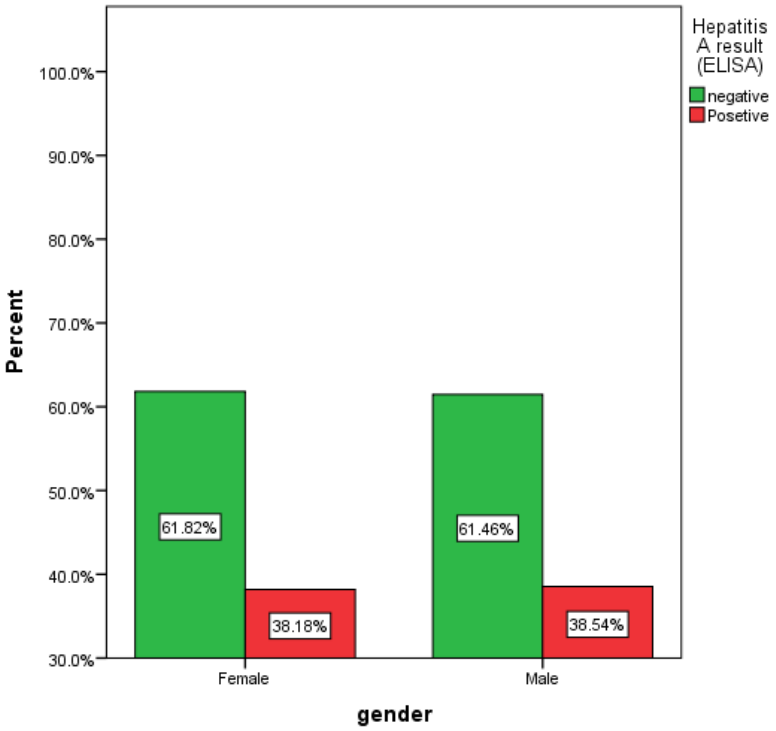


Figure 2. Comparison of cases with positive HAV serology bygender

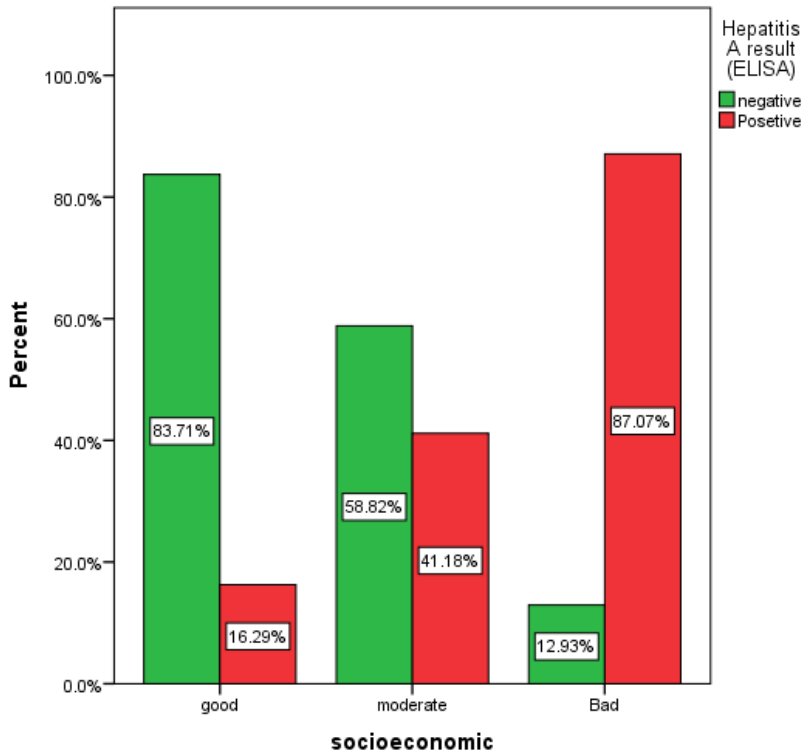


Figure 3. Comparison of cases with positive HAV serology bysocioeconomic status

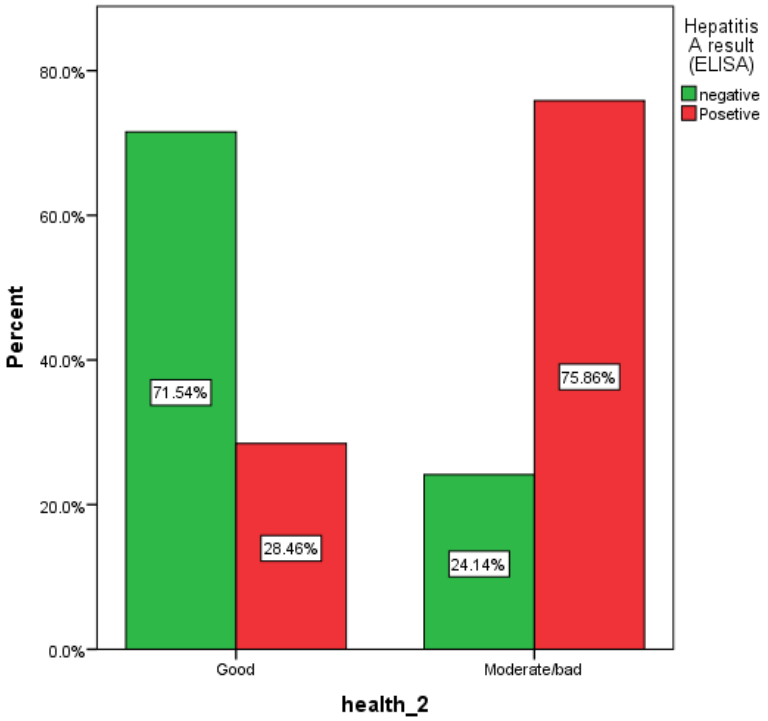


Figure 4. Comparison of cases with positive HAV serology byhealth status

In the present study, other than age, an important factor in the incidence of disease, environmental factors, especially the socioeconomic and health status, were significantly more effective in the incidence of disease, so that in people with a poor socioeconomic status, 87% of the cases were HAV seropositive and in people with poor health status, seroprevalence was 100%. In other studies, another factor that was effective in reducing the incidence of HAV infection was improvement in environmental conditions and health status [14]. Some studies showed that it is possible to control the disease, especially in the toddlers, by improving the health status [13,20,21].In a study by Karimi et al. in Chaharmahal and Bakhtiari province (central part of Iran) by investigating the prevalence of symptomatic HAV infection, among 70 patients with jaundice, 48 cases had HAV infection that most of positive cases were in the age group of under-10 years. Therefore, hepatitis A should be considered in children, especially at an early age, in the presence of jaundice [22]. The study of Rezaee-Zavareh et al. showed that the incidence age of HAV infection has shifted from childhood to adolescence. In addition, vaccination in people working in the health system seems necessary [23].

In a study on children under the age of 15 years in Kashan (central part of Iran), the prevalence of HAV infection was 3.9% [24] and another study in Isfahan province (central part of Iran) on people aged 6 to 20 years, the prevalence of disease was 10% [25], although in some studies, HAV seropositivity was lower, including in a study done in Sari, a prevalence of 38.9% was reported in people under the age of 25 years [26]. In the study of Mostafavi et al. by investigating the prevalence of HAV infection in people aged 10 to 18 years in 16 provinces of Iran, a total of 2494 subjects were studied that the rate varied from 50.43% in Fars province (south of Iran) to 78.81% in Markazi province (central part of Iran), and was more common in children whose mother was employed. Also, in Tehran, 250 subjects were investigated that a prevalence of 57.9% was observed [27]. In another study in Tehran on subjects under the age of 20 years was found HAV seropositivity in 61.6% of study population [28]. In a study in Khorasan Razavi (northeast of Iran) in people between 15 and 24 years old, a prevalence of 64.7% [29], in Fars province in people between 15 and 20 years old, 79.3%) [30], in Shiraz (south of Iran) in people between 15 and 20 years old, 79.4% [31] and in a study in Golestan province (north of Iran), an HAV seroprevalence of 76.86% in patients aged 17 years old was reported [32].

According to studies conducted in Iran, HAV seropositivity is different in various provinces and in different age groups. However, in most studies based on the study reports, the prevalence of this disease in Iran is high, and Iran is an area with a high or medium prevalence, and so, the need to improve health status and vaccination in areas with high prevalence and high risk people is felt.

Conclusion

The results of this study showed that higher prevalence of seropositivity of HAV was seen in older people and also lower socioeconomic and health status. Therefore, the prevalence of this disease in the study population was considered very low and recommended for vaccination of people at risk (travelers to high endemic areas, intravenous drug users, subjects with coagulation disorders and/or chronic liver disease).

Conflict Of Interest

None declared.

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