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Epidemiology of hepatitis C in Islamic Republic of Iran

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ABSTRACT

Objective: To investigate the epidemiological features and demographic characteristics of hepatitis C virus (HCV) infected patients and the accurate incidence rate of HCV in Islamic Republic of Iran.**Methods:** This retrospective study was conducted using the data from Iranian National Hepatitis Registry Database consisted of the registered records of HCV patients during 2010–2012. Data were analyzed to calculate the incidence of hepatitis C infection according to age, sex and region of residence in Iranian population during the period.**Results:** During 2010–2012, about 7765 patients were registered with HCV in Iran. The mean age of patients was (40.4 ± 14.2) years, and the average annual incidence of the disease was 34.5 cases in one million population. The highest incidence rate and frequency of the infection was observed in men aged from 30 to 39 years and in women from 60 to 69 years. The lowest incidence rate and frequency were observed in the age group under 10 years old. The incidence of the disease was higher in the divorced and nomads. Most HCV cases were diagnosed in hospitals.**Conclusions:** HCV is less prevalent in Iran as compared to the neighboring countries. Hepatitis C prevention programs should focus more on people aged from 20 to 40 years, the divorced and nomads.

1. Introduction

Hepatitis C virus (HCV) infection is a blood-borne disease and a major health problem worldwide[1,2]. More than 500 000 new cases of liver cancer are detected each year in the world, and HCV accounted for up to 22% of them[3]. According to a report of World Health Organization, three percent of the population in the world[4] and over 100 million people in Asia have been infected with chronic HCV infection[5], and 23 million of them living in the Eastern Mediterranean countries[6]. The highest prevalence of the disease was reported in Africa and the Middle East and the lowest prevalence of it has been observed in the US, Australia, and Northern and Western Europe[3,7]. In the Middle East, the highest prevalence was reported in Egypt, Jordan and Qatar[8].

In 2011, Iran had a population of 75 149 669 in 31 provinces. Among them, 21 446 783 of the population were in urban, 53 646 661 were in rural areas and 22 556 were non-residents[9]. From year 2004, the Iranian Ministry of Health has launched a national registry to record all cases of HCV from all around the country[10,11].

A few studies have investigated the incidence of the disease in Asia and the Middle East. According to these studies, the incidence of HCV was 242/10⁶ people in China[12], 780.4/10⁶ people in Saudi Arabia[13] and 6900/10⁶ people in Egypt[14]. The incidence of HCV in adults (202/10⁶) was higher than that in children (12/10⁶)[15].

Around 200 000–300 000 people in Iran have been infected with HCV[16]. The prevalence of HCV is less than 0.5% in the general population of Iran[17] and there are a half million chronic carriers[18]. Reportedly, there is an increasing trend in the incidence of the disease[19].

Despite compulsory blood screening of HCV since the year 1990, the prevalence of HCV infection almost remained constant worldwide and only increased in some developing countries. Since there is currently no effective vaccine to prevent HCV infection, a majority of patients are susceptible to cirrhosis and hepatocellular carcinoma. Therefore, it is important for health policy makers to

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know the incidence of the disease. A few reports were published from some areas of Iran and the incidence of HCV remained unknown[20,21].

The aim of this study was to investigate the epidemiological features and demographic characteristics of HCV infected patients and to report the accurate incidence rates of it in Iran according to the data available in the Iranian National Hepatitis Registry during 2010–2012.

2. Materials and methods

This retrospective study was conducted using data from the National Hepatitis Registry Database. By law, all public and private laboratories, the Blood Transfusion Organization, hospitals and medical centers should report HCV cases to the registry. The information is recorded in the registry database to monitor the disease and its trend. According to this surveillance system recommendation, each case of confirmed HCV infection had to be reported, and all the demographic data on infected cases should be recorded systematically throughout the country[12].

All recorded HCV cases in the registry during the years 2010–2012 were included in this study. To calculate the incidence, total population was extracted from 2011 Iranian national census data.

Given that the study analyzed the data provided by the national database, the ethics committee approval was not necessary. Data were analyzed using SPSS version 18 (IBM Inc. USA). Descriptive statistics were used to calculate HCV incidence according to age groups, gender, region of residence and frequency of demographic factors of HCV. *P* value less than or equal to 0.05 was considered statistically significant.

In order to calculate HCV incidence, given that the population at risk was small, it was not excluded from the denominator.

3. Results

From 2010–2012, 7765 HCV cases were recorded in the database. The mean age of the patients was (40.4 ± 14.2) years. Females [(44.6 ± 18.1) years] were older than males [(39.8 ± 13.4) years] (*P* < 0.0001). The annual incidence of HCV was 34.46 /10⁶ population. The annual incidence rate of HCV in males was seven folds more than females (Tables 1 and 2) (*P* ≤ 0.05).

Table 1

Annual incidence rate of hepatitis C according to sex, area of residence and marital status in Iran during years 2010–2012.

Variable	Incidence rate (per 10 ⁶ population)	
Crude incidence	34.5	
Sex	Male	59.7
	Female	8.7
Area of residence	Urban	42.5
	Nomad	55.3
	Rural	14.4
Marital Status	Married	3.6
	Widowed	1.2
	Divorced	9.4
	Single	2.9

Table 2

Frequency of HCV according to various factors in Iran during the years 2010–2012.

Variable	Frequency (%)	
Age group (years)	1–9	0.4
	10–19	1.3
	20–29	21.7
	30–39	32.2
	40–49	18.4
	50–59	15.2
	60–69	7.0
	over 70	3.9
Sex	Male	87.4
	Female	12.6
Marital status	Widow	1.5
	Single	30.0
	Divorced	3.5
Area of residence	Married	65.0
	Urban	88.0
	Rural	11.9
Source of HCV report	Nomad	0.1
	Laboratory	18.0
	Hospital	35.0
	Private office	3.0
	Blood transfusion organization	11.0
	Clinic	8.0
Health centers	25.0	

The highest HCV incidence was observed in men aged 30–39 years old and women aged 60–69 years old. The lowest incidence and frequency of HCV were observed in population under 10 year. The differences between the highest and the lowest incidence rates in various age groups were 80 folds, more than 120 folds in men and over 40 folds in women (Figure 1 and Table 2). The incidence of the disease increased with age, up to 40 years old, and slowly decreased there after (Figure 1).

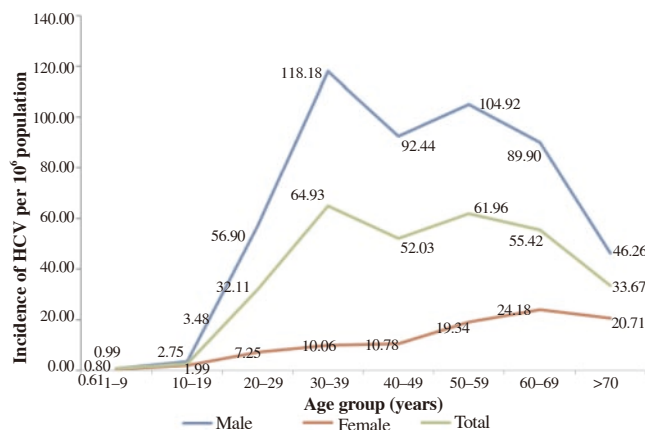


Figure 1. Incidence of HCV patients according to age groups and sex in Iran during the years 2010–2012.

Incidence of HCV was higher in the divorced and nomads as compared to the others (Table 1). Most cases were diagnosed in hospitals (Table 2).

4. Discussion

All the studies conducted in Iran before were limited to small geographic areas or specific sub-populations[22]. The results of this

study showed that the prevalence of the disease was several times more in men than in women. The highest incidence and prevalence were in the age group of 30–39 years. Most patients were identified in hospitals and the majority of them were married.

The mean annual prevalence of the disease was 34.46 in 10⁶ population, which was much lower than the annual prevalence of HCV in other countries of the Middle East and Asia [12-14,20,23,24] and lower than the other developing countries of the world [13,14,25].

Our findings showed that the majority of patients (32.2%) is in the age group of 30–39 years. Given that 17% of the Iranian population are in this age group, preventive actions are needed. HCV patients in the age group over 60 years are almost 27 times more than the age group under 10 years. This difference is probably due to the higher lifetime exposure to risk factors in the over-60 age group.

In the present study, the highest prevalence was observed in the age group of 30–39 years old and the lowest rate of prevalence was in the age group under 10 years. The prevalence increases with age in both sexes until the age of 40 and then gradually decreases. The reason for this increased prevalence in older age groups is probably the fact that this age group is more active in the society and therefore has a higher exposure to risk factors for HCV. Also, the cumulative frequency of high-risk behaviors increases simultaneously with age, thus the exposure increases and the risk of HCV infection in this age group are higher as compared to other age groups. Several overseas studies confirm this finding [5,15,26-29].

The prevalence of HCV is several times more in men than women ($P < 0.0001$). Reported results of studies in other Middle Eastern countries like Saudi Arabia [15], Egypt [30,31], Iraq [32], Libya [26] and studies in other countries [25,28,33,34] are also similar to the findings of this study. The likely reason may be risky behaviors of men such as intravenous drug abuse and risky sexual behaviors.

Most people who are infected with HCV are in the sexually active age, which indicates more exposure and thus the higher prevalence of the disease in this age group, especially in divorced individuals who probably have high-risk sexual relations. Findings of other studies in Iran and other countries confirm this finding [27,28,31,35,36].

In this study, HCV prevalence showed the highest in the tribal area, which can be due to poor living conditions, low socioeconomic conditions, inadequate personal hygiene and lower education of the people in those areas. Studies in other countries [30,36,37] confirm this finding, too.

There are some limitations in this study. The data have been collected from civil registration data reporting system for HCV. Despite being mandatory to report patients who have been identified by health centers in the registry [10], there is a possibility of HCV under-reporting. Therefore, the results may be underestimated. However, even in population-based studies in which the diagnosis is based on regular screening, it cannot be claimed that the prevalence is precisely calculated, because up to 35% of patients may be

unaware of their HCV infection [38]. According to the World Health Organization [39], many people infected with HCV, in both general population and populations at risk remain undiagnosed. Moreover, we have considered newly diagnosed cases in this study to adjust.

In conclusion, the incidence of HCV in Iran is less than the neighboring countries. Most prevention programs are needed for the age groups of 20–40 years old, with an emphasis on health education regarding prevention of HCV infection. The results of this study may be used in planning for the management and control of this disease in Iran and other parts of the world.

Conflict of interest statement

We declare that we have no conflict of interest.

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