

Seroepidemiology of Hepatitis C Antibody Between Rural and Urban People: A Retrospective Study in June to December of 2005 in Malekan City, Iran

¹A.Tanomand, ²H. Montazam and ²M. Kafshnochi

¹Faculty of Nursing Maragheh, Tabriz University of Medical Science, Tabriz, Iran

²Islamic Azad University of Bonab, Iran

Abstract: One of the most substantial problems in public health is Hepatitis C Virus (HCV) infection, which affects approximately 1%-5% of the world's population and occurs in all countries (170 million). In this research 346 serum samples were tested for anti-HCV antibodies by using ELISA method by double check and analyzed information by SPSS version 14. Results showed the seroprevalence of anti-HCV antibodies was found to be 1.5% in the general population in Malekan city. The study included 165 male and 181 female. There was no significant difference in HCV prevalence between males and females ($p=0.17$) and our study included 269 rural and 77 urban. There was no significant difference in HCV prevalence between rural and urban ($p=0.5$). The age-specific rates, which were similar in both sexes, indicated the lowest rate in 0-6 year's group (0%) with a strong increase in the older (30-40 and 40<) age group (6%). In our study, the most of the subjects were rural (269 persons); unemployed (103 persons) and unlettered (250 persons). The seroprevalence of anti-HCV antibodies in our study was found to be higher than in other study in different parts of Iran. The high prevalence of HCV in our research may be due to some of socioeconomic factors such as education, job and residents region (rural, urban, developing city and...). Therefore, socioeconomic factors such as educational rate, job and... had a significant correlation with the prevalence of anti-HCV.

Key words: Hepatitis, seroepidemiology, HCV, anti HCV virus, Malekan

INTRODUCTION

One of the most substantial problems in public health is Hepatitis C Virus (HCV) infection, which affects approximately 1-5% of the world's population and occurs in all countries (170 million). The rate of HCV infection differs in particular countries. The prevalence in developed countries amounts to 0.2-2.2%, while in developing countries it reaches 7%. In some regions or in risk groups rate of occurrence may be as high as 30-90% (Eskandar *et al.*, 2006). The prevalence of infection in healthy blood donors ranges from 0.01-0.02% in the northern Europe and 1-1.5% in southern Europe to 6.5% in parts of equatorial Africa (Wasley and Alter, 2000). The estimated prevalence in Australia has been recently reported as 2.3% with the virus affecting 210000 people by 2001 (Theodore and Jamal, 2006). Prevalence rates as high as 20% have been found in Egypt (Habib *et al.*, 2001).

According to the published data, the prevalence of HCV infection is 0.3-1% in Iran (Rezvan *et al.*, 1994; Ansar and Kooloobandi, 2001; Ebrahim *et al.*, 1997; Ghavanini and Sabri, 2000). Iran is located in the Middle-East in a position like a bridge between Indian subcontinent, Arab peninsula, Middle Asia and Europe. This geographical situation, mass immigration from Afghanistan and Iraq,

frequent travels in western borders to Turkey and illegal drug traffic from eastern borders with Pakistan and Afghanistan have all affected epidemiology of HCV in our country.

Hepatitis C virus is a blood-borne pathogen and the main risk factors predominantly are through exposure to infected blood or blood products, such as: transfusion with unscreened blood and blood products (Butler *et al.*, 2004) needle-sharing among drug abusers as a major risk factor for infection (Hahn *et al.*, 2001) and needle-stick injuries in health care workers (Sulkowski *et al.*, 2002). Persons at increased risk of acquiring hepatitis C include hemodialysis patients (Shamshirsaz *et al.*, 2004), hemophiliac patients (Franchini *et al.*, 2004), infants of mother with HCV infection (Syriopoulou *et al.*, 2005) and promiscuous persons (Hajiani *et al.*, 2006). Percutaneous procedures (e.g., ear and body piercing, circumcision and tattooing) may be important (Alavian *et al.*, 2002). It seems that HCV may also spread iatrogenically through the use of nondisposable needles and syringes and practice of traditional healing techniques involving puncture of skin. The probability of HCV transmission through sexual intercourse is very low but not absent within monogamous long-term sexual contact and the physicians should inform the patients that there is some

risk (Guadagnino, 1998; Clarke and Kulasegaram, 2006). Sexual transmission is more frequent among those with high-risk sexual behaviors such as multiple sexual partners, history of other sexually transmitted diseases, working as a prostitute, nonprotected sexual contact and sexual activities with trauma. Regarding these data, the sexual transmission of HCV in prostitutes and homosexuals is not as high as IDUs. Such data suggest a limited role for sexual transmission in general population (Einollahi *et al.*, 2007). However, having multiple sexual partners, attending sexually transmitted disease clinic and prostitution are associated with an increased risk of HCV infection (Neaigus *et al.*, 2007). This seems to be very important in Iranian IDUs since they report such high-risk behaviors and play as a source of infection for the whole community. Zero point twelve percent of Iranian blood donors had a positive anti-HCV antibody and one of the important risk factors by this case-control study was sexual promiscuity (defined as one or more extramarital sexual relationships and/or sex with prostitutes, according to Iranian culture). The overall rate of anti-HCV positivity appears low in sexual partners of HCV-infected hemophiliacs, unless there is coexistent HIV infection (Alavian *et al.*, 2000).

This difference yields the need for different preventive methods, community interventions and even selecting different therapeutic strategies based on economic and social variance and epidemiological information on HCV is essential for strategic prevention of chronic hepatitis, liver cirrhosis and cancer.

MATERIALS AND METHODS

In a cross sectional study from June to December of 2005, Blood samples of 346 people (181 female and 165 male), who were stayed in Malekan city (west of Iran) were collected under aseptic conditions and serum of samples were separated. Our sampling method was randomizing from all of area (rural and urban people) in Malekan city and samples number estimated by statistically and standard methods. After serum preparation, the serum samples were tested for anti-HCV antibodies by using ELISA method by double check (Avicenna Medical Center-Russia Kit was used). Then we analyzed information by SPSS version 14 in the base of sex, age groups, socioeconomic factors related to disease included in their questionnaire. Chi-square test was applied to test the significance of the factors studied in relation with the seroprevalence of anti-HCV antibodies.

RESULTS AND DISCUSSION

In this research, the seroprevalence of anti-HCV antibodies was found to be 1/5% in the general

population in Malekan city. The study included 165 male and 181 female, There was no significant difference in HCV prevalence between males and females ($p=0.17$) and our study included 269 rural and 77 urban, There was no significant difference in HCV prevalence between rural and urban ($p=0.5$). The age-specific rates, which were similar in both sexes, indicated the lowest rate in 0-6 year's group (0%) with a strong increase in the older (30-40 and 40<) age group (6%). In our study the most of the subjects were rural (269), unemployed (103) and unlettered (250). There was the good relation between educational rates of cases with prevalence rate.

Nearly all of studies regarding estimation of prevalence of HCV infection in general population in Iran have been conducted on healthy blood donors. In the first report that appeared in literature in 1994, Rezvan *et al.* (1994) in Iranian Blood Transfusion Organization (IBTO) reported 0.3% of blood donors in Tehran to have positive anti-HCV antibody (Ab) (Rezvan *et al.*, 1994). Recently, a study on 5,976 blood donors in Rasht, northern part of Iran, showed that 0.5% of the cases were positive (Ansar and Kooloobandi, 2001). Others on North-West reported a prevalence of 0.97% positive HCV antibody (Ebrahim *et al.* 1997). In another study in Shiraz in southern part of Iran on 7,897 cases, anti-HCV antibodies were found in 0.59% (Ghavanini and Sabri, 2000) In our study, the seroprevalence of anti-HCV antibodies was found to be 1.5% in the general population in Malekan city. The seroprevalence of anti-HCV antibodies in our study was found to be higher than in other study in different parts of Iran. The high prevalence of HCV in our research may be due to some of socioeconomic factors such as education, job and residents region (rural, urban, developing city and...), because, in our study the most of the subjects were rural (269 persons); unemployed (103 persons) and unlettered (250 persons). Therefore, socioeconomic factors such as educational rate, job and... had a significant correlation with the prevalence of anti-HCV. Generally speaking, it seems that the whole population prevalence is less than 1% in Iran that is lower than that of the regional countries: 1.1% in Yemen, 0.9% in children to 1.8% in adult blood donors in Saudi Arabia and 4% of blood donors and 3% of college students in Pakistan. The reason may be accounted by lower rate of needle-sharing for injection in past, earlier implementation of safe blood transfusion and using accurate testing in high-risk groups, although none of these are fully evidence-based (Alavian *et al.*, 2005).

CONCLUSION

The pattern of HCV may be changing in Iran as the prevalence has increased in the Malekan city compared to previous reports. Thus, there is necessary for the

introduction of HCV test for people pre-marriage and providing educational programs for STD disease and also it is very important for controlling of HCV. Considering the some of limited factors of the study, it would be prudent to evaluate the results of this study with others study, because this study was the first and primary study in Malekan city.

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