

ORIGINAL ARTICLE

PREVALENCE AND RISK FACTORS OF HIV, HEPATITIS B VIRUS AND HEPATITIS C VIRUS INFECTIONS IN DRUG ADDICTS AMONG ZANJAN PRISONERS

Mohammad Khani MD^{*}, Mohammad-Masoud Vakili MSc

Zanjan University of Medical Sciences, Zanjan, Iran

Background – The spread of human immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV) continues at an alarming rate worldwide. This pandemic has created a dramatic, often devastating, impact on many countries including Iran. Due to the similar route of transmission of HIV, HBV and HCV, intravenous drug abusers are considered one of the leading high-risk groups. The aim of this study was to determine the prevalence rate of these viruses and associated risk factors among intravenous drug addicts in Zanjan prisoners.

Methods – This was a cross-sectional investigation conducted in 2001. The study population included 346 drug addict prisoners in Zanjan. Data were collected through interview and blood testing for HIV, HBV and HCV. All blood samples were examined using enzyme-linked immunosorbent assay. Samples positive for HIV were confirmed using Western blot.

Results – The prevalence of HIV infection was 1.2%, HBV 3.8% and HCV 47.7%. Intravenous injection, homosexuality and tattooing were, statistically, significantly associated with HIV-, HBV- and HCV-positivity, separately and cumulatively.

Conclusion – Taking into account the similarities that exist among the routes of transmission of these viruses and the high rate of infection with HCV in the population studied, it can be predicted that the rate of infection with HBV and HIV will tend to increase. Accordingly, preventive and health education programs are essential.

Keywords HIV HBV HCV IV drug users Iran

Introduction

Acquired immunodeficiency syndrome (AIDS), including its social and economic aspects, has led to an immense problem for human health. No country is AIDS free, and the epidemic is out of control in most regions.¹ Nowadays, AIDS is considered the leading killer of young people and the fourth leading killer in all age groups.² We face a disaster with destructive consequences perceptible in countries where the prevalence of this disease is high. AIDS has made millions of people abandon their hopes and has negated efforts toward developing and upgrading the quality of life. It has

overshadowed aspects of life such as economic, health and social development.² From the global appearance of this disease to the end of 2000, approximately 58 million people were infected with HIV and nearly 22 million people have died due to this illness.³

Although the epidemic in the eastern Mediterranean region is not as widespread as in other areas, we should not feel safe and indifferent. The number of cases of infection in this region is estimated to be 220,000.² Studies indicate that most high-risk groups involved are males, including youths, addicts, prisoners and migrants. Investigations in Bahrain, Iran, Egypt, Kuwait, Oman, Pakistan and other countries in the region indicate an increase in the transmission of the virus through drug injection.² In Iran, some 3,430 people were infected with HIV by the end of December

•Correspondence: M. Khani MD, Azadi Blvd, Zanjan University of Medical Sciences, Zanjan, Iran. Fax: +98-241-39624. E-mail: khani@zums.ac.ir.

Table 1. Prevalence of human immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV) in the population studied.

| Infection | Number | Percent | p Value |
|---------------|--------|---------|---------|
| HIV | 4 | 1.2 | — |
| HBV | 13 | 3.8 | — |
| HCV | 164 | 47.4 | — |
| HIV, HBV | 1 | 0.3 | 0.14 |
| HIV, HCV | 4 | 1.2 | 0.049 |
| HBV, HCV | 7 | 2.1 | 0.65 |
| HIV, HBV, HCV | 1 | 0.3 | — |

2001, 63% through drug injection.⁴ Hepatitis B virus (HBV) is one of the most common infectious diseases in the world, with more than one million deaths per year due to progress of the chronic disease to cirrhosis and/or hepatocellular carcinoma.⁶ It has been estimated that 350 million people worldwide are chronic HBV carriers.⁵ Similarly, it has been estimated that there are 170 million chronic carriers of hepatitis C virus (HCV) in the world, and reported prevalence rates range between about 0.1% in countries such as Iceland and Norway to 18.1% in Egypt.⁷

The routes of transmission of HIV, HBV and HCV are similar, and intravenous drug abusers are considered one of the leading high-risk groups. It is essential to estimate the prevalence of infection in a society in which infectious disease preventive programs including HBV and HCV have been proposed. To this end, an attempt has been made in this research to determine the risk factors for and prevalence of infection with HIV, HBV and HCV.

Patients and Methods

In this cross-sectional study conducted in 2001, 346 male drug addicts (aged 18 – 71 years) were enrolled. All were prisoners in Zanjan, northwestern Iran. Face-to-face interviews were carried out by three general practitioners using a questionnaire that elicited personal data as well as the history and duration of addiction, the kind and route of drug use and some high-risk behaviors such as shared syringe use, sexual behavior and tattooing. Peripheral blood (10 mL) was taken from each individual and transported to Zanjan Blood Transfusion Organization's Laboratory for sera extraction. All samples were kept frozen until the necessary tests were carried out. The samples were examined first using enzyme-linked immunosorbent assay (ELISA) to detect anti-HIV (Bio-Rad, France), hepatitis B surface antigen

(HBsAg; Organon Technica, Holland) and anti-HCV (Ave Cena, Russia). HIV-positive samples were examined using Western blot (Bio-Rad) to confirm the positive results. Data were extracted from the questionnaires and summarized. Chi-square analysis was used to determine the relationship between the prevalence of infection and age, education, job, marriage, habitation, heroin abuse, intravenous administration, syringe sharing, blood transfusion and tattooing. All analyses were performed using SPSS (version 9).

Results

The prevalence of HIV infection was 1.2%, HBV infection 3.8% and HCV infection 47.4% (Table 1). The mean age \pm standard deviation was 33.7 ± 10.2 years. Educational status is shown in Table 2. There was no significant association between educational status and HIV, HBV and HCV infections. Of the population, 35% were single, 59.8% were married and 5.2% were divorced. There was a significant association between being single and HCV infection ($p = 0.002$). The proportion of individuals infected with HCV increased with age in unmarried groups: 38.6% of unmarried people aged 18–24, 67.2% of unmarried people aged 25–34, 83.3% of unmarried people aged 35–44 and 100% of unmarried people aged 45–54 years.

There was no significant association between these infections and occupation (Table 3). Of the population, 91% lived in urban areas and 9% in rural areas. There was a significant association between residence in urban areas and HCV infection ($p = 0.001$). The findings showed that 59.3% of the population had a history of heroin abuse; 37% had used heroin through injection and 12% had a history of using shared syringes and needles. There was a significant association between heroin use and HCV infection ($p = 0.0001$). Furthermore, there was a significant association between intravenous drug injection and

Table 2. Distribution of educational status in the population studied.

| Educational status | Number | Percent |
|-------------------------|------------|------------|
| Illiterate | 40 | 11.6 |
| Able to read and write | 27 | 7.8 |
| Primary school level | 95 | 27.5 |
| Secondary school degree | 115 | 33.2 |
| High school level | 14 | 4 |
| High school degree | 40 | 11.6 |
| University degree | 15 | 4.3 |
| Total | 346 | 100 |

Table 3. Distribution of the population studied based on occupational status.

| Occupational status | Number | Percent |
|---------------------|------------|------------|
| Jobless | 22 | 6.4 |
| Office worker | 14 | 4 |
| Military forces | 6 | 1.7 |
| Factory worker | 67 | 19.4 |
| Self employed | 237 | 68.5 |
| Total | 346 | 100 |

both HIV infection ($p = 0.04$) and, HCV infection ($p = 0.0001$). Of subjects studied, 28.3% had promiscuous sexual relationships with women and 6.1% were homosexual. There was a significant association between homosexuality and HCV infection ($p = 0.001$), but we did not observe any association between HIV/HBV infections and sexual relationships. Although 5.8% of the individuals had a history of blood transfusion, there was no association between receiving blood and HIV, HBV or HCV infections. Of the subjects, 56.4% had a history of tattooing. There was a significant association between tattooing and both HIV infection ($p = 0.04$) and HBV infection ($p = 0.0001$).

Discussion

Although the HIV/AIDS epidemic started in Iran in 1986, its rapid spread, particularly in some high-risk groups including addicts, is worrisome. In the population studied, there was an association between high-risk behaviors and infection with HIV, HCV and HBV. Among these behaviors, intravenous drug injection, using shared syringes and needles, sexual relationships with men and women and tattooing are important. There was a statistically significant association between intravenous drug injection and both HIV and HCV infections. There was also a significant association between a history of tattooing and both HIV and HBV infections. The prevalences of HIV, HBV and HCV infections were 1.2%, 3.8% and 47.4%, respectively, and there was a significant association between HIV and HCV infections. Zali et al also found HCV antibody in 182/402 (45.3%) of their cases.⁸ Of these antibody-positive individuals, 73 (40.1%) cases had a history of tattooing. Based on the study conducted by Santolamazza et al in 754 intravenous drug abusers, the prevalences of HIV, HBV and HCV were 2.5%, 61.4% and 63.9%, respectively.⁹ Also, the study in 325 prisoners by Christensen et al

indicated that 43% of the individuals studied had a history of intravenous drug abuse; 64% and 87% of these were infected with HBV and HCV, respectively. However, in this study the rate of infection with HIV was zero.¹⁰ According to the investigation by Shirin et al in narcotic drug abusers, none of the people studied were infected with HIV, but the seroprevalences of HBV and HCV in intravenous drug users were 11.6% and 28.8%, respectively, and in nonintravenous drug-users were 6.6% and 5.8%, respectively.¹¹

Although the prevalence of HIV and HBV infections is still low in the population studied, taking into account the similarities in routes of transmission of these viruses with HCV and also the high rate of the prevalence of HCV, it can be predicted that there is a high probability of an increase in the incidence of HBV infection and particularly HIV in the near future. Therefore, the threat to the health of our society is serious and we should not waste any time in this regard. Since health education is the most economical and effective way of preventing such infections, efforts at all levels should be directed to achieve this aim. Undoubtedly, drug addicts are one of the likeliest groups to be exposed to infection and this group would benefit from a very high priority in preventive and education programs. However, other groups of society should not be forgotten. Such programs should be carried out urgently and constantly for all social classes because there are no race, border, sex or age limits for these diseases.

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