



Comparing the Prevalence of HTLV-1 and Its Risk Factors in Prisoners with Intravenous and Non-Intravenous Drug Use in Birjand

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Abstract

Background and Objectives: Regarding the high prevalence of the risk factors for human T-cell leukemia Virus (HTLV) in prison, including the high intravenous drug use and the higher chance of unprotected sexual behaviors, homosexuality, tattoos, and the probability of association between this disease and other sexually transmitted infections such as HTLV, this study compares the prevalence of HTLV-1 and its risk factors in intravenous and non-intravenous drug user prisoners in Birjand.

Methods: This descriptive-analytical study was conducted in Birjand Prison during 2014-2015. The research community included all the prisoners of Birjand. Census method was used across intravenous drug users and simple random sampling for non-intravenous drug users' group where sample size was considered to be 300 individuals (69 individuals in the case group and 231 individuals in the control group). Collected data were analyzed by descriptive statistics, Chi-square and Fisher's exact tests in SPSS software v.21 at significance level of 5%.

Results: According to the results of the study, there was no case of HTLV-1 in either of the two groups. However, prevalence of smoking and history of common injection, non-sterile injections, suspected sexual contact, alcohol consumption, and tattoo in intravenous drug users were significantly higher than in non-intravenous drug users ($P < 0.05$).

Conclusions: The results of this study suggested that although the prevalence of this disease was zero in the studied community, the prevalence of its risk factors was significant. This requires planning to reduce the risk factors associated with this disease in the target community.

Keywords: South Khorasan, Prisoners, Intravenous Drug User, Human T-cell Leukemia Virus (HTLV)

1. Background

The human T-cell leukemia virus type-1 (HTLV-1) is a virus with a positive-sense single-stranded RNA genome that belongs to the Deltavirus genus and Retroviridae family. Four types of HTLV (HTLV 1/2/3/4) have been identified worldwide up to now, with HTLV-1 being the first human retrovirus reported in 1979 in a patient with cutaneous T-cell lymphoma (1-3). HTLV can be transmitted through at least three known routes including sexual contact mainly from a man to a woman, contaminated blood products and using common syringes, and vertical transmission from the mother to the infant during breastfeeding (3, 4). Despite the various transmission routes of HTLV, 90% - 95% of the infected people are without complications and it only develops to adult T-cell leukemia (ATL), a highly invasive form of leukemia, in a small percentage (2% - 5%) of the infected individuals. The disease causes many deaths in endemic areas. Supportive care is an important clinical procedure for this group of patients besides therapeutic ap-

proaches (1, 5).

Although the occurrence of HTLV-1 is reported worldwide, its global and regional-local prevalence is not clear. Data indicate that at least 5 - 10 million individuals in the world are infected with this virus (2, 3). The endemic areas of HTLV-1 are mainly the southwest parts of Japan, the Caribbean countries, South America (Colombia), some parts of Africa, and parts of the Middle East (Northeast of Iran, including Mashhad and Neyshabur) (2, 3). The prevalence rate of HTLV is different depending on the geographic area and high-risk behaviors. In general, the prevalence rate in endemic areas is about 1% to 6%, increasing to 25% - 40% among populations over 50-years-old indicating its increase as the age increases (2). The highest prevalence of HTLV was observed among intravenous drug users. Research by Koech et al. indicated an overall increase in the prevalence of HTLV-1 from 6.6% in 1988 to 52% in 2004 in Iran, with the highest prevalence rate (52%) being reported among intravenous drug users. This increase is probably

due to the increase in the number of drug users and the injection of drugs with high-risk behaviors, including using common syringes (3, 6).

Currently, addiction is a global health problem. There are approximately 13 million intravenous drug users worldwide, with 78% living in developing countries (7). Intravenous drug users play an important role in the transmission of viral diseases such as HTLV, HIV, and sexually transmitted diseases (8). A high incidence of HTLV-1 is reported in prisons because of the conditions facilitating the transmission of the disease in the prison environment, including the high rate of intravenous drug use, unprotected sexual behaviors, homosexuality, and tattooing.

2. Objectives

Overall, the probability of sexually transmitted infections such as HIV and HTLV and chronic infectious complications is high in prisons. Based on the high prevalence of the disease in prisoners, this study aimed to compare the prevalence of HTLV-1 and its risk factors among prisoners in Birjand between the two groups of intravenous and non-intravenous drug users.

3. Methods

In this descriptive-analytical study, the study population included all prisoners in the Central Prison of Birjand. A census sampling method was used to recruit a group of intravenous drug users and a simple random sampling method to recruit a group of non-intravenous drug users. Accordingly, all intravenous drug users (N = 69) in the Central Prison of Birjand constituted the case group and 231 non-intravenous drug users constituted the control group. After receiving written consent, a researcher-made questionnaire was self-administered. The demographic characteristics to be gathered included age, marital status, education level, and history of drug use, common injection, non-sterile injection, suspected sexual contact, surgery, cupping, alcohol consumption, tattooing, receiving blood/blood products, blood transfusion, and previous imprisonment. Then, 5 cc of blood was collected from the brachial vein of the subjects and immediately transferred to the laboratory of Birjand University of Medical Sciences to separate their serum and plasma. The prepared sera from patients were used in the ELISA test. The data of the questionnaires and the results of the tests were analyzed using SPSS V. 21 by independent *t*-test, chi-square test, or Fisher's exact test at the alpha level of 0.05.

4. Results

This study was conducted in 300 drug users in the Central Prison of South Khorasan with a mean age of 37.4 ± 9.4 years, ranging from 20 to 78 years. The mean age was 35.6 ± 8.9 years in intravenous drug users and 37.9 ± 9.5 years in non-intravenous drug users, with no statistically significant difference ($P = 0.07$). All of the studied prisoners were male. The study indicated that the prevalence of HTLV-1 was nil in both case and control groups. In terms of education, 18.6% and 23.2% of intravenous drug users and non-intravenous drug users, respectively, had a diploma or higher degrees. There was a significant difference in the frequency distribution of education level between the two groups ($P = 0.001$). There was also a significant difference in the frequency distribution of marital status between the two groups ($P = 0.008$) (Table 1).

The prevalence of smoking and history of common injection, non-sterile injection, suspected sexual contact, alcohol consumption, and tattooing were significantly higher in intravenous drug users than in non-intravenous drug users (Table 2).

5. Discussion

HTLV-1 is responsible for developing a group of clinical syndromes such as ATL or lymphoma. Therefore, the recognition of the epidemiology and clinical manifestations of this virus is necessary for its accurate diagnosis. Currently, there is no definite treatment for the infection of this virus, but the recognition of the exact frequency of its positive serology in various populations, including intravenous drug users, may reduce its prevalence through preventive strategy (9). This study aimed to determine and compare the prevalence of HTLV-1 in prisoners with intravenous and non-intravenous drug use in Birjand. The results of the study indicated that the prevalence of this disease was zero in both groups, but the prevalence of risk factors associated with the transmission of this disease was high in the study population, including unprotected sexual behaviors (40%), the use of tattoos (26%), and a history of blood transfusion (4%). The results of this study are consistent with the results by Ghafouri and Ameli in terms of the risk factors associated with the transmission of the disease, such as the history of blood transfusion. The results of their study on blood-borne viral contamination indicated that the prevalence of HTLV infection was 0.42% among 42652 blood donors in South Khorasan (10). In the study by Hedayati, which evaluated the HTLV-1 infection in Iran, a high prevalence of HTLV-1 infection was reported in the general population of Razavi Khorasan, including Mashhad, Neyshabur, Sabzevar, and

Table 1. Frequency Distribution of Education Level and Marital Status in Prisoners with Intravenous and Non-Intravenous Drug Use

	Addiction status		Results of Chi-Square Test (P Value)
	Non-Intravenous Drug Use ^a	Intravenous Drug Use ^a	
Education level			15.7 (0.001)
Illiterate	44 (23.8)	3 (5.1)	
Elementary school	49 (26.5)	29 (49.2)	
Secondary school	49 (26.5)	16 (27.1)	
Diploma or higher	43 (23.2)	11 (18.6)	
Marital status			9.58 (0.008)
Married	189 (81.8)	48 (69.6)	
Single	38 (16.5)	15 (21.7)	
Divorced	4 (1.7)	6 (8.7)	

^aValues are expressed as No. (%).

Table 2. Comparison of the Risk Factors of HTLV-1 in the Two Study Groups of Intravenous and Non-Intravenous Drug Users

Risk factor	Study Group		P Value (Chi-Square or Fisher's Test)
	Non-Intravenous Drug Use (N = 231)	Intravenous Drug Use (N = 69)	
Addiction to cigarette	145 (62.8)	60 (87)	< 0.001*
History of common injection	1 (0.4)	14 (20.3)	< 0.001*
History of non-sterile injection	3 (1.3)	17 (24.6)	< 0.001 (Fisher)
History of suspected sexual contact	81 (35.1)	39 (56.5)	< 0.001*
History of cupping	28 (12.1)	8 (11.6)	0.91
History of alcohol consumption	37 (16)	29 (42)	< 0.001*
History of tattooing	32 (13.8)	46 (66.7)	< 0.001*
History of blood transfusion	47 (20.3)	16 (23.2)	0.61
History of surgery	59 (25.5)	23 (33.3)	0.2
History of receiving blood	8 (3.5)	4 (5.8)	0.4 (Fisher)

Torbat-e-Heydariyeh. Although the prevalence of this infection in blood donors of Mashhad decreased from 1.97% in 1994 to 0.42% in 2006, its prevalence in the general population of Mashhad was still high as 2.12% in 2009. Furthermore, the HTLV-1 infection was 0.29% in the general population of Golestan province. It was also significant in blood donors of some provinces across the country including Chaharmahal and Bakhtiari (0.62%), West Azarbaijan (0.34%), Hormozgan (0.18%), and Alborz (0.11%) (11). The variation in different cities is due to the epidemiological nature of the virus. The same was true in various cities of the United States and Europe.

Few studies have been conducted on the prevalence of HTLV-1 in prisoners. In Iran, research showed a prevalence of 3.4% in prisoners in Razavi Khorasan (12), which is different from the results of our study. The difference in risk factors, the period of study, and preventive strategies can

be addressed to justify the difference in South Khorasan and Razavi Khorasan. Studies conducted in prisoners in other countries reported the prevalence of 3.7% in Indonesian prisoners with intravenous drug use (13) and 1.58% in a prison in Brazil (14) that are close to the results of the study conducted in Razavi Khorasan.

Compared to various studies carried out in high-risk groups and blood donors, the prevalence of HTLV-1 is low in South Khorasan. This conclusion is based on the studies performed in hemophilia patients (2.9%) (15), dialysis patients (2.43%) (16), and blood donors (0.42%) (10), indicating a significantly low HTLV-1 prevalence compared to the study in Razavi Khorasan (11).

The prevalence of HTLV in the United States among intravenous drug users was reported to be 0% in Miami and 20% in Los Angeles, but its prevalence in Spain was 6.4% in Madrid, 3.8% in Barcelona, and 0% in Seville (17).

5.1. Conclusions

The results of this study indicated that although the prevalence of HTLV-I was zero in the research population, its risk factors were significantly prevalent. Therefore, due to the proximity of South Khorasan province to endemic areas such as Razavi Khorasan, enough attention must be paid to the prevention of this disease in the region.

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Footnotes

Authors' Contribution: All authors participated in all the stages of the study.

Conflict of Interests: It is not declared by the authors.

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