



Prevalence of human immunodeficiency virus and tuberculosis among homeless individuals

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Received: 13 March 2017

Accepted: 19 May 2017

ePublished: 26 June 2017

Keywords: Acquired immune deficiency syndrome, Tuberculosis, Homeless, Human immunodeficiency virus

Abstract

Introduction: Human immunodeficiency virus infection / acquired immune deficiency syndrome (HIV/AIDS) and tuberculosis are the most important communicable diseases in vulnerable populations.

Objectives: The aim of this study was to determine the prevalence of HIV/AIDS and tuberculosis among homeless individuals in Shiraz, Iran.

Patients and Methods: This is a cross-sectional study which was carried out on 589 homeless men and women in Shiraz city in 2014. The data collection tool was a structurally standard questionnaire. After filling questionnaire, ELISA test was taken each person. If the results of the ELISA test were positive, then, a complementary Western blot test was conducted for HIV. Accordingly a PPD was conducted for individuals suspected to tuberculosis. Data were analyzed by ANOVA and student *t* test.

Results: HIV prevalence in this population was 7.6%. Around 8.88% of HIV positive cases were men. Around 2.37% of the cases had an experience of drug injection. The difference between cases with positive test of HIV in drug users and those who did not use drugs was statically significant ($P < 0.05$). Around 34.7% of men had experienced of sex with other mes (MSM).

Conclusion: In this study, prevalence of HIV in participants was 7.6%, therefore much more attention needs to be paid to the health of homeless people.

Citation: Afsar Kazerooni P, Khazaei Z, Mousavi M, Khazaei S, Sohrabivafa M, Dehghani SL, et al. Prevalence of human immunodeficiency virus and tuberculosis among homeless individuals. Immunopathol Persa. 2018;4(1):e06. DOI: 10.15171/ipp.2018.06.



Introduction

The co-infection of tuberculosis (TB) and human immunodeficiency virus (HIV) infection for nearly the past three decades has posed a major danger to the international community's effort (1). At the end of 2008, an estimated 33.2 million people were infected with HIV, of whom 2.1 million were children. Likewise, an estimated 2.7 million people were newly infected with HIV in 2007, and 2.1 million expired of AIDS (2). Of the people infected with HIV, nearly two-thirds live in sub-Saharan Africa (3). TB, as an infectious agent, is one of the most important causes of death in the world (4). In 2008, the estimated global TB incidence rate was 139 cases per 10⁵ populations,

Core tip

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which is equal to 9.4 million (range, 8.9–9.9 million) incident TB cases (5,6).

An estimated 100 million people worldwide are homeless. In high-income countries, country-specific data suggested that more than 650 000 individuals in the United States, and about 380 000 in the United Kingdom are homeless at any one time (7). Many aspects including living situations cause homeless people to expose to very massing, poor ventilation, undernourishment, and lack access to health care. Societal factors

bear particularly on homeless people (8). Some of these individuals included to the closure of psychiatric refuges, permissive use of alcohol, tobacco, and illicit drugs (9). Health problems in homeless populations have been previously reported. Mortality rates are four times higher in the general population of infections in homeless people (10). This can lead to community infections which are related with malnutrition, lengthy periods of homelessness, and high use of medical services (7). While absolute proportion of homeless people are high in some countries, improvements in care could have marked effects on public health (11,12). A wide range of estimates for the prevalence of infectious diseases in homeless people have been reported, mainly for TB, hepatitis C virus and HIV (13).

Homeless people are at high risk for both latent and active TB, because they live in homeless shelters and other assembled facilities. Therefore, they are more probable to engage in high-risk behaviors such as use of injection drugs and abuse of other substances (14). Environmental and behavioral risk factors can incline homeless people to converse from an otherwise latent infection into an active disease (7). Thus, it may negatively affect their incentive to engage in TB screening and treatment (14). Homelessness may be related to long-term or short-term crises, including family battle, neglect and abuse, or residential instability (15). Homeless youths are more likely to engage in earlier sexual intercourse, have multiple sexual partners, and contribute in other high-risk sexual behaviors such as; survival sex or replacing sex for money, drugs, shelter, food, or clothing (16). Health anxieties for many homeless youths include high rates of sexually transmitted infections (STIs), pregnancy, and drug abuse (17).

Objectives

Due to a lack of any information on the situation of TB infection and HIV infection in homeless people in Shiraz, this study was conducted to determine the prevalence of the aforementioned infections among homeless people in Shiraz.

Patients and Methods

This is a cross-sectional study, which was carried out on 589 homeless men and women who were recruited from centers working with the authority of the municipality of Shiraz in 2014. According to the programs of addiction prevention and control of homeless, they defined as someone who had no home or shelter for residence, while usually lived on the corners of streets, in parks, or in public places, if there was no designated residence provided by governmental or non-governmental organizations.

A researcher-made questionnaire was applied to assess high risk behaviors of participations. Questions included demographic characteristics and putative risk factors for HIV and TB infection (gender, age, education, history of substance abuse, high risk sexual behavior).

Laboratory assessments

Blood samples were taken to determine the prevalence of HIV. Each person answered the researcher made questionnaire completely. Then ELISA test was carried out. If ELISA test was positive, then a complementary Western blot test was conducted. Consequently a PPD test was conducted for each person. If PPD was positive, then the case subsequently refereed for sputum test and chest X-ray.

Ethical issues

The research followed the tenets of the Declaration of Helsinki. Before the study, written informed consent was obtained from all patients who participated in the study. All information about individuals was coded and kept confidential. In addition, the ethical committee of Shiraz University of Medical Sciences approved this study.

Data collection

Data were analyzed by the descriptive statistics including frequency tables and chart as well as analytic statistics including analysis of variance (ANOVA) and student *t* test through SPSS (version 18, SPSS Inc, Chicago) software package. *P* values less than 0.05 were considered statistically significant.

Results

The total sample size for this study was 589 people. Of whom, 490 were men and 98 were women. Of all participants, we considered those having positive ELISA for HIV. out of 54 ELISA positive, 45 cases were confirmed by western blot. Thus HIV prevalence in this population was 7.6%. Around 40 people with positive HIV were men, thus the prevalence of HIV in men was 8.1%. The prevalence of HIV in women was 5.1%. Hence, in this study no statistically significant difference between gender ($P < 0.05$) was detected. PPD test was positive for 137 people, 110 of them were male and 27 were female. However, none of them had positive TB findings in chest X-ray (Table 1). There was no statistically significant relationship between the individuals' age, sexual relationship outside the family framework as well as MSM (men who have sex with men) among the participants in the study ($P > 0.05$). In this study, there was no significant difference between age group and injecting drug addiction ($P > 0.05$).

Table 1. The frequency of HIV and tuberculosis infection among homeless people

Infection		Male No. (%)	Female No. (%)
HIV	ELISA	47 (9.59)	7 (7.14)
	Western blot	40 (8.16)	5 (5.10)
Tuberculosis	PPD+	110 (22.44)	27 (27.55)
	Chest X-ray +	0 (0)	0 (0)

Table 2. Age distribution of homeless participants

Group	Minimum	Maximum	Mean	SD
HIV positive	24	60	38.28	6.75
HIV negative	16	67	37.44	9.24

Table 3. The data of participants

Variable	Frequency	HIV positive	Percent	P value
Age group (y)				
15-24	31	1	3.2	>0.05
25-34	205	13	6.34	
35-40	147	19	12.92	
>40	199	12	6.03	
Educational level				
Illiterate	75	7	9.33	>0.05
Primary education	140	21	15.01	
Education tips	92	6	6.5	
High school	92	6	6.5	
University	51	5	9.8	
High risk sex (multiple partner)				
Yes	170	21	12.35	<0.05
No	378	24	6.34	
MSM				
Yes	36	6	16.66	>0.05
No	454	39	8.59	
History of IDUs				
Yes	14	6	42.85	<0.05
No	575	39	6.78	

Abbreviation: IDUs, intravenous drug users.

The difference between the two groups in terms of age, sexual intercourse outside the family frame work and MSM was not significant ($P > 0.05$) (Table 2). The difference between the two groups in the amount injecting drug use was significant ($P < 0.05$) (Table 3).

Discussion

In this study, prevalence of HIV in participants was 7.6, which its proportion for men and women was 8.16% and 5.10% respectively. According to the modeling, HIV prevalence in Iran population is about 0.15%, however in exposed groups, it is above 5%. Based on the latest estimations in modeling method, an estimated 100 000 people with positive HIV in Iran was existed (18,19). Most cases having positive HIV in Iran are between 25 to 34 years old. However, in this study, the age of people with positive HIV ranged between 35 to 40, but prevalence differences among various groups were not statically significant (18-20).

According to the estimation, nearly 3.91% of people with positive HIV were men and 7.8% were women in Iran (19, 21). However, in our study, 8.88% of cases were men and 1.11% were women. Meanwhile, estimations indicated that the most important group with positive HIV is injecting drug abusers who are about 250 000 to 300 000 people of Iran population. The latest serology and behavioral studies

revealed that nearly 15% of them are infected with this disease (19,22).

In our study, 2.37% of the cases had experienced drug injection. Consequently, the difference between cases with positive HIV in drug abusers and those who do not use drugs was statically significant ($P < 0.05$). The chance of positive HIV in men experiencing sex with other men is equal to the chance of those who did not have such experiences. In our study, 34.7% of men have experienced sex with other men, but the difference in HIV positive cases in two groups was not statistically significant ($P > 0.05$). The chance of positive HIV in groups experiencing sexual relations outside the family framework is tantamount to the chance of those who do not have such relations. In current study, 28.86% of people had experienced risky sexual behavior. However, the difference in HIV cases in two groups was not statistically significant. The rate of TB prevalence in prisons, lock-ups, and refugees' camps is higher than any other places. In our study, we also detected that of 23.25% of individuals with positive PPT test, none of them had positive chest X-ray findings of TB.

Acknowledgments

We would like thank Shiraz University of Medical Sciences, as well as all those who helped us in this study.

Author's contribution

PAK, ZK and MM were the principal investigators of the study. SK, MSV, and SLD participated in preparing the concept and design. ZK and MM reviewed the manuscript. All authors participated in preparing the final draft of the manuscript, reviewed the manuscript and critically evaluated the intellectual contents. All authors have read and approved the content of the manuscript and confirmed the accuracy or integrity of any part of the work.

Conflicts of interest

The authors declare no conflict of interest.

Ethical considerations

Ethical issues (including plagiarism, data fabrication, double publication) have been completely observed by the authors.

Funding/Support

This study was funded by the Shiraz University of Medical Sciences.

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