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Prevalence of HIV infection and the correlates among homeless in Tehran, Iran

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PEER REVIEW

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Comments

Introduction is quite concise and well-addresses the paucity of data regarding the frequency of HIV among Iranian homeless. Discussion also thoroughly compares the results of different studies which were conducted among other high-risk groups like MSM and IDUs. This article adds quite novel data regarding the frequency of HIV infection among Iranian homeless.
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ABSTRACT

Objective: To determine the prevalence of HIV infection among homeless men and women and the related risk behaviors in Tehran, Iran.

Methods: In 2007-2008, Tehran municipality stacked up 10 657 homeless men and women for assessment of HIV and began collaboration with Iranian Research Center for HIV/AIDS (IRCHA) departments to conduct HIV infection prevalence surveys in homeless populations. The results were analyzed for associations with demographic information, family support, status of drug abuse and relation with family and friends.

Results: Overall HIV prevalence was 1.7% (95% confidence interval 1.4-1.9). Factors independently associated with HIV infection included history of using drugs [AOR 8.15 (4.86-13.67)], older age [AOR 1.80 (1.08-2.99) for 40- 55 yr], occupation [AOR 1.64 (1.19-2.24) for unemployed], and no relation with family [AOR 1.82 (1.30-2.54)].

Conclusions: This study supports the idea that injection drug use is contributing to the increased spread of HIV among Iranian homeless. Harm reduction programs should be expanded, particularly among homeless injection drug users.

KEYWORDS
Homeless, HIV infection, Prevalence

1. Introduction

While more than 24 000 HIV-infected cases have been identified in Iran, current estimates from UNAIDS argue that more than 90 000 HIV-positive people are living in the nation. Although injection drug use (IDU) has been primarily introduced as the main route of transmission, heterosexual route has also been speculated as the second most prevalent way of HIV acquisition. In fact, except for a prevalence rate of more than 5% among IDUs, it is estimated that prevalence rate remains less than 1% in general public, ranking Iran among countries with concentrated epidemic[1,2].

Among at risk populations, homeless people have been of immense interest worldwide. Globally, a wide range of 8.5% to 42% of homeless people is HIV-infected, and the figure seems to be rising especially in the developing world[3].

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It seems that IDU is the primary route of HIV transmission among Iranian homeless population[3,4]. In United States, HIV infection among homeless adults ranges between 10.5% and 21%; which is believed to be strongly associated with practice of risky behaviors particularly with means of unprotected sexual contacts.

It has been shown that certain demographic and behavioral features are associated with HIV infection among the homeless: illiteracy or low education, being widowed or separated for homeless women, heavy alcoholism, being gay, lesbian or bisexual in homeless youth, casual sexual contacts and survival sex among runaway youth and substance use have been previously mentioned by some authors[5]. In general, impoverished and disfranchised homeless may decidedly engage in behaviors that put oneself at risk for HIV acquisition. For example, condoms are less likely to be used, in part due to less availability and less access to health care centers or having sex under the effect or context of drugs. Additionally, more significant life stressors such as unemployment could be observed among those coping with housing stressors. This cluster of risks occurring among these minorities further highlights the need for immediate interventions, especially in developing nations[6,7]. To our knowledge, no previous study has addressed the prevalence rate of HIV infection in Iranian homeless. We conducted this study to identify the prevalence of HIV infection and determine its demographic correlates among the homeless in Tehran, Iran.

2. Materials and methods

Methods of the survey have been described previously[1]. Briefly, we conducted a cross-sectional survey among the homeless men and women, who were approached consecutively upon detention in Tehran, Iran, to estimate the prevalence of HIV infection and associated risk factors during 2007 and 2008. Participants included homeless men and women who were arrested by municipality and kept in special camps in Tehran. Participants were approached to be assessed for HIV infection and associated risk factors. Records were kept separate from other homeless, gathering system and referrals for treatment and care were given through Tehran University Medical Center. The Institutional Review Board of municipality reviewed and approved the study protocol.

We offered serologic screening for HIV antibody. Samples were first screened using an enzyme-linked immune sorbent assay (Biotest AG, Dreieich, Germany). HIV positive samples were confirmed by Western blot (Diagnostic, Berlin, Germany). A questionnaire was used to record demographic information and injecting drug risk behaviors. A total of 10 657 people participated and provided a specimen. HIV point prevalence was calculated as the number of confirmed HIV positive individuals and the test results were stratified by demographic characteristics and injection drug use. After description of the variables by proportions and 95% confidence intervals (*CI*), we conducted logistic regression analyses to determine associations with HIV infection. Variables associated with HIV infection in bivariate analysis at the $P\leqslant 0.10$ level were included as potential independent predictors. The final model retained those variables associated with HIV infection at $P<0.05$ level.

3. Results

Demographic characteristics and risk behaviors of the homeless are described in Table 1. Of the 10657 participants, 178 (1.7%) were HIV positive (95% *CI*: 1.4-1.9; Table 1).

Table 1

Characteristics, behaviors, and HIV infection prevalence among the homeless, Tehran, Iran, 2007-2008.

Variables		N[1] (%)	HIV infection (*N*)	HIV infection prevalence % (95% *CI*)
Total		10 657 (100)	178	1.7 (1.4 -1.9)
Gender[2]	Male	9 622 (90.3)	175	1.8 (1.6-2.1)
	Female	1 035 (9.7)	3	0.3 (0.06-0.8)
Age groups[2]	<25 yrs	950 (9.0)	8	0.8 (0.4-1.6)
	25-40 yrs	4 328 (41.2)	89	2.0 (1.6-2.5)
	40-55 yrs	3 292 (31.4)	66	2.0 (1.5-2.5)
	55-70 yrs	1 255 (12.0)	12	0.9 (0.5-1.7)
	≥70 yrs	668 (6.4)	0	0.0 (0.0-0.5)[3]
Birthplace	Tehran	6 231 (58.5)	107	1.7 (1.4-2.1)
	Other	4 426 (41.5)	71	1.6 (1.2-2.0)
Education level[2]	Illiterate	4 342 (40.7)	48	1.1 (0.8-1.5)
	Primary	2 197 (20.6)	43	1.9 (1.4-2.6)
	Junior high school	2 099 (19.7)	44	2.1 (1.5-2.8)
	Senior high school and college	1 888 (17.7)	42	2.2 (1.6-3.0)
	Bachelor and higher	131 (1.3)	1	0.8 (0.02-4.2)
Marital status[4]	Single	5195 (48.7)	81	1.5 (1.2-1.9)
	Married	2 974 (27.9)	44	1.5 (1.1-2.0)
	Separated	951 (8.9)	28	2.9 (2.0-4.2)
	Divorce	913 (8.6)	18	2.0 (1.2-3.1)
	Widow	624 (5.9)	7	1.1 (0.4-2.3)
Occupation[2]	Unemployed	5 403 (50.7)	112	2.1 (1.7-2.5)
	Employed	5 254 (49.3)	66	1.2 (1.0-1.6)
Nationality	Iran	10 464 (98.2)	177	1.7 (1.4-1.9)
	Other	193 (1.8)	1	0.5 (0.01-2.8)
Parents	Alive	4 413 (41.4)	67	1.5 (1.2-1.9)
	Dead	6 243 (58.6)	111	1.8 (1.5-2.1)
Life condition[2]	Alone	6 780 (63.6)	134	2.0 (1.6-2.3)
	Along with family or friend	3 877 (36.4)	44	1.1 (0.8-1.5)
Relation with family[2]	No	6 272 (58.8)	127	2.0 (1.7-2.4)
	Yes	4 385 (41.2)	51	1.2 (0.9-1.5)
Family support[4]	No	10 115 (94.9)	175	1.7 (1.5-2.0)
	Yes	542 (5.1)	3	0.5 (0.1-1.6)
Relation with friends[5]	No	6 996 (65.6)	128	1.8 (1.5-2.2)
	Yes	3 661 (34.4)	50	1.4 (1.0-1.8)
Status of drug abuse[2]	No	4 381 (41.1)	18	0.4 (0.2-0.6)
	Injection	3 044 (28.6)	113	3.7 (3.1-4.4)
	Non-injection	3 232 (30.3)	47	1.4 (1.1-1.9)
History of hospitalization[5]	No	10 471 (98.2)	178	1.7 (1.5-2.0)
	Yes	186 (1.8)	0	0.0 (0.0-2.0)[3]

[1]: Subgroups do not always add up to total due to missing data.
[2]: $P\leqslant 0.002$, [3]: One-sided 97.5% *CI*, [4]: $P\leqslant 0.05$, [5]: $P=0.08$.

At the $P<0.10$ level, HIV infection was associated with male gender, older age, low educational level, marital status, unemployment, no relation with family and friends, no family support, history of hospitalization and injection drug use (Table 1).

In Table 2, we showed independent associations of prevalent HIV infection among the homeless, including all variables associated with HIV infection at $P<0.05$. Older age [adjusted odds ratio (AOR) 1.80 (1.08-2.99) for 40-55 years], unemployment [AOR 1.64 (1.19-2.24)], no relation with family [AOR 1.82 (1.30-

2.54)] and injection drug use [AOR 8.15 (4.86–13.67)] remained independently associated with HIV infection (P<0.05).

Table 2
Independent associations of prevalent HIV infection among homeless, Tehran, Iran, 2007–2008.

Model		Adjusted odds ratio (95% *CI*)	*P*–value
Age groups	<25 years	–	referent
	25–40 years	1.70 (1.04–2.79)	0.03
	40–55 years	1.80 (1.08–2.99)	0.02
Occupation	Employed	–	referent
	Unemployed	1.64 (1.19–2.24)	0.002
Relation with family	Yes	–	referent
	No	1.82 (1.30–2.54)	<001
Situation of drug abuse	No	–	referent
	Non–injection	3.21 (1.83–5.62)	<001
	Injection	8.15 (4.86–13.67)	<001

4. Discussion

In the present study, HIV infection was identified in 1.7% of homeless people, which is less than prevalence rates reported by some previous studies[2]. We also showed that older age, unemployment, weaker family ties and injecting drugs are correlated with HIV infection among Iranian homeless. According to our study, 28.6% of homeless in Tehran had ever injected drugs, implying that injection drug use is a common and recurring event among the majority of the homeless throughout the nation; thereby, homeless may serve as amplifiers of HIV infection, especially by sharing injection equipment[2]. The vast Iranian homeless population has primarily emerged from massive immigration and rapid urbanization. Thus, expansion of injection drug use among these people who are chiefly marginally housed and possess low socioeconomic levels has resulted in a relatively high prevalence of HIV infection.

Some studies imply that being separated or widowed, sexual promiscuity, extreme poverty and low educational level are associated with high risk of HIV acquisition among homeless people[8–10]. In compliance with our study, HIV infection was more prevalent in older participants (44–50 years old); isolation and family disturbances in addition to weaker family ties were also significantly associated with HIV infection among the homeless. In a study of homeless men in India, those who were illiterate, recently migrated, ever married, drank alcohol and perceived themselves to be risk free were more likely to engage in high risk sexual behaviors. Weaker family ties, lack of social inhibitions in a new place and peer pressure promoted sexual mixing[11]. In another study of factors associated with incarceration history among homeless HIV–positive patients, 68% reported a history of incarceration. Incarceration history was associated with having ever injected drugs, ever engaged in sex exchange and ever experienced physical abuse[12].

Many of the researches conducted has been focused on sexual risk behaviors of the homeless. In a study of men who have sex with men (MSM) and men who have sex with men and women (MSMW) that were mostly homeless in Los Angeles, high prevalence of HIV infection was identified: 12% of MSMW and 65% of MSM. Being homeless was associated with unprotected anal intercourse and commercial sex working. Thereby, a concentration of risk has been reported among these impoverished minorities, where many men use drugs, trade sex and have sex with either gender. Mixing of sexual networks could account for spread of HIV, considering that these men spend much time in jails and on the streets, places at which sexual networks can be connected. Therefore, homeless MSMW can function as potential bridges for HIV to cross[7]. In a study of Indian homeless, about 90% of married homeless men visited commercial sex workers (CSW), but only 3.3% consistently used condoms, which means that homeless men should be considered as a potential bridge for HIV transmission from CSWs to general public[11]. Considering that the main route of HIV acquisition among Iranian homeless is IDU, studies on high risk sexual behavior among Iranian IDU have revealed high prevalence of unprotected sexual contact with CSWs[2,13,14]. However we did not ask about sexual behaviors that could possibly contribute to the spread of HIV, future studies should confer the role of high risk sexual activity among Iranian homeless IDUs.

Regarding that common and similar risk factors have been reported for HIV acquisition among homeless, preventive strategies should primarily focus on drug use and high risk sexual activity in a worldwide range. A study of comparisons between prevention programs for homeless youth revealed that all of these programs primarily aimed to reduce HIV–related sex and drug use. Moreover, all of the interventions provide access to health and mental health services as basic program resources[15–18]. In case of Iranian homeless, implementation of needle exchange programs, expanding methadone maintenance therapy among homeless IDUs, renewing education and promoting condom use are of great value toward reducing HIV acquisition among homeless population.

Conflict of interest statement

We declare that we have no conflict of interest.

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Comments

Background

The HIV infection has been addressed as one of the most worrying health concerns to date; hence it has reached to pandemic levels. Accordingly, HIV infection does mostly affect some most at risk group *e.g.* homeless population in most of the countries. Among developing nations such as

Iran, this issue is quite prominent and less studied.

Research frontiers

Considering that homeless population are among at risk groups for acquisition of HIV infection, assessment of the prevalence and correlates of HIV among Iranian homeless would be of utmost importance. In addition, the large sample size of the study might have included homeless people from varying levels of demographic parameters.

Related reports

Many prior investigations have addressed the correlated factors of HIV infection in high risk groups *i.e.*, injection drug users, addicts, low-income populations, sex workers, HCV, HBV infection, *etc*. However, no previous study has addressed the prevalence of HIV infection and its correlates among Iranian homeless.

Innovations and breakthroughs

I think it is quite interesting to evaluate the HIV prevalence rate of such high risk population in a developing country such as Iran. Additionally, assessing the associates of HIV infection among homeless may further contribute in designing and implementing preventive strategies. As I said before, it is a novel study hence it measures the prevalence of HIV among a quite large sample of Iranian homeless.

Applications

The results of the current study are beneficial in designing strategies that would best target the associates of HIV infection. For example, the identified associates in this study especially injection drug use, low educational level and no social bond with family or friends implies that psychosocial support as well as aiming injection drug use might be beneficial in preventing the spread of HIV among this group.

Peer review

Introduction is quite concise and well-addresses the paucity of data regarding the frequency of HIV among Iranian homeless. Discussion also thoroughly compares the results of different studies which were conducted among other high-risk groups like MSM and IDUs. This article adds quite novel data regarding the frequency of HIV infection among Iranian homeless.

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