

The Prevalence of Human Immunodeficiency Virus Infection in Patients with Sexually Transmitted Diseases

Abstract

Background: Human immunodeficiency virus (HIV) transmission pattern in Iran has been changed from injection drug to sexual contact. Lack of accurate assessment of HIV in people with sexually transmitted diseases (STDs) in Iran prompted us to conduct this study to determine the frequency of HIV infection in these patients. **Materials and Methods:** In this cross-sectional study which conducted in 2016–2017, overall, 190 patients with STDs referring to two hospitals of Hamadan were enrolled in the study. All of the patients were examined for HIV in the first visit by rapid test and then 1 and 4 months later by the 4th generation ELISA. A questionnaire including demographic data, clinical manifestations, and high-risk behaviors was completed for all of the referring people. The collected data were analyzed using appropriate statistical tests. **Results:** Of 190 patients, 126 (66.3%) were female with a mean age of 34.1 ± 10.1 years and 64 (33.7%) were male with a mean age of 30.8 ± 7.8 years. One hundred twenty-eight (67.4%) got married, 73 (38.4%) and 76 (40%) had a diploma and postgraduate education, respectively, 32 (16.8%) mentioned the history of unsafe sex, and 23 (12.1%) had used condoms continuously during sexual contacts. The most common STDs were reported genital warts, 107 patients (56.3%), vaginal discharge (28, 14.7%), and genital ulcer (33, 17.4%). Two (1%) patients were positive for HIV at the first visit. **Conclusion:** Patients with STDs should be considered as an important source of HIV transmission, so clinicians should pay more attention to screening these patients for HIV infection.

Keywords: Human immunodeficiency virus, Iran, prevalence; sexually transmitted infection

Introduction

Sexually transmitted infections (STIs) are considered as one of the most important public health concerns in developed and developing countries. Some of STIs can result in serious complications such as pelvic inflammatory disease, infertility, ectopic pregnancy, cervical cancer, neonatal death, or congenital anomalies. Meanwhile, these infections can facilitate the transmission of blood-borne diseases, including human immunodeficiency virus (HIV) and hepatitis B virus through sexual contacts.^[1] In addition to the sexual route, blood product transfusion, mother to child breastfeeding, intrauterine, and delivery are known as another way to the acquisition of some STIs.^[2] To diagnose, although studying the etiologic agents of sexually transmitted diseases (STDs) is better and more accurate, the syndromic approach to the management of STDs is more practical in many areas, especially if the diagnostic tests are limited. One of the

important components of the management of patients with STI is the referral of patients for the testing of AIDS.^[3]

Annually, about 8.8 million STIs occur among 13–24 year-old American young. Nearly 26% of new cases of HIV infections are also found in this same age group.^[4] In Iran, the actual prevalence of STIs is much higher than official data and recorded.^[5] STIs are the most important diseases among 15–24 years' young males, which can influence the risk of HIV transmission.^[2] According to the UNAIDS, an estimated 36.9 million people globally and 66,000 in Iran are living with HIV/AIDS and also 1.8 million people globally and 5000 in Iran are newly added to the known HIV-infected population.^[6] Although the risk of HIV acquisition and its related deaths have currently declined in most areas in the Middle East and North Africa,

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the prevalence of the virus is rising. In Iran, an estimated one-quarter of HIV cases are detected and the rest are remained hidden. While drug injection is currently the most prevalent way for HIV transmission in Iran, high-risk sexual contacts as an important risk factor are rising considerably.^[7] STIs are useful indicators of high-risk sexual behaviors; meanwhile, unsafe sexual behaviors are the main source of HIV transmission among Iranian women.^[8,9] Over the past decade, according to the Iran's Ministry of Health and Medical Education, the number of patients with HIV/AIDS has tripled and sexual transmission has increased by 13%–40%.^[10] Regarding the facilitating role of STIs for HIV acquisition and also given that there is no accurate frequency assessment of the virus in people with STIs in Iran, this study was conducted to determine the frequency of HIV infection in patients with STIs in two major hospitals in the Hamadan city in Iran.

Materials and Methods

This cross-sectional descriptive study was conducted to determine the frequency of HIV infection in people with the syndromic definition of STIs referred to two major hospitals in Hamadan, Western Iran, in 2016–2017. All of the people with symptoms and signs of STIs who referred to the educational clinics of dermatology, infectious diseases, and gynecology were enrolled in the study if their diagnosis was confirmed by specialists. All of the patients with previously known HIV infection or abusing intravenous (IV) drugs were excluded from the study. The syndromic approach of each STDs such as gonorrhea, genital warts, and genital herpes without etiologic agents' study was performed according to the World Health Organization and national guidelines of STDs.^[3,11] The diagnosis of each patient was confirmed by a related specialist, including a dermatologist, gynecologist, or a specialist in infectious diseases. One hundred ninety patients were entered into the study using census methods. For all patients who had indications for syndromic management of STDs and were willing to participate in the present study, after receiving the informed consent, designed questionnaire including demographic data, history of unsafe sex, condom use, injecting drug addiction, previous HIV infection, and also, the clinical manifestations of STDs was completed. Any person with a history of injecting drug addiction or known case of HIV infection was excluded. The HIV rapid test was performed for all the enrolled patients by an experienced nurse at the reception time. Using rapid test with SD Bioline HIV-1/2 3.0 (product codes 03FK10-p-5) manufactured by SD Standard Diagnostic, Inc. subsequently, all of patients were examined on 1st and 4th months later by using 4th generation ELISA (Diapro, Italy) at the HIV clinic of Hamadan health center. All information, including demographic data, clinical manifestations, any history of high-risk sexual behaviors, and jail were recorded on a predesigned checklist.

Ethical considerations

This study was approved by the Ethics Committee of Hamadan University of Medical Sciences (code, IR.UMSHA.REC.1395.367).

Statistical analysis

Data were analyzed using SPSS version 16 (SPSS Inc., Chicago, IL, USA). To describe the quantitative data, the mean and standard deviation were used, and for the qualitative data, percentages and ratios were used. For quantitative variables, Student's *t*-test was applied, and for qualitative variables, Chi-square test was applied subsequently. $P < 0.05$ was considered statistically significant.

Results

In this present study, 190 patients with STDs with a mean age of 32 ± 8 years were examined for HIV infection. The baseline characteristics of the patients are exhibited in Table 1.

Women were almost twice as likely as being men to have STDs ($P = 0.001$). Whereas all of the men and 19 of 126 women were employed, the other women were housewives. Among the participants, unsafe sex was reported more frequently in men than in women ($P = 0.001$). None of the patients with STD had any history of injecting drug use. Approximately 23 (12.1%) patients had used the condom as barrier prevention. Clinical manifestations of the STDs patients are shown in Table 2.

The most common presentations were genital warts, copious vaginal discharge, and genital ulcers. Two (1%) participants had a positive rapid test that was confirmed by the ELISA fourth generation test subsequently. One of both HIV-infected patients was an unmarried boy and the other was a woman, aged of both <30 years old with elementary education, which came with the main complaint of genital warts. Both HIV-positive patients reported high-risk sexual behaviors with multiple sexual partners and without any use of condoms. All of the next fourth generation ELISA tests were reported as negative.

Discussion

The findings of the present study revealed briefly the utmost of the patients were female, young or married with a diploma or academic degree. The most common manifestations were genital warts, high vaginal discharge, and genital ulcers. Among 190 participants, 1% were found positive for HIV.

We choose the syndromic approach to identifying STIs, which have been approved by the WHO, chiefly for countries or areas that the practitioners have limitations for etiologic assessment of STIs. This method has low

Table 1: Demographic characteristics of the patients with sexually transmitted diseases

Characteristic	Male (n=64)	Female (n=126)	Significance
Age (mean±SD)	30.86±4.70	34.08±10.08	0.016
Marital status, n (%)			
Married	36 (56.2)	92 (73.0)	<0.001
Single/divorced	28 (43.8)	34 (27.0)	
Illiterate, n (%)	2 (3.1)	39 (31.0)	
Diploma and academic	62 (96.9)	87 (69.0)	0.001
Unsafe sex, n (%)			
Yes	28 (43.8)	4 (3.2)	0.001
No	36 (56.2)	122 (96.8)	
Condom use, n (%)			
Yes	15 (23.4)	8 (6.4)	0.001
No	49 (76.6)	118 (93.6)	

SD: Standard deviation

Table 2: Clinical manifestations of the patients with sexually transmitted diseases

Presentation	Male	Female	Total, n (%)
Genital ulcer	3 (4.7)	30 (23.8)	33 (17.4)
Urethral discharge/dysuria	12 (18.7)	6 (4.8)	18 (9.5)
Vaginal discharge	-	28 (22.2)	28 (14.7)
Genital wart	47 (73.5)	60 (47.6)	107 (56.4)
Acute proctitis	-	2 (1.6)	2 (1)
Epididymo-orchitis	2 (3.1)	-	2 (1)
Total	64 (100)	126 (100)	190 (100)

sensitivity for the diagnosis of the patients with true STIs but is useful for screening planes.^[9,11]

The distribution of age, sex, and also the educational degree of our patients was agreed by Rostami *et al.* study.^[9] Similar to the current study, the utmost of STIs occur between the ages of 15 and 49.^[12]

In the current research, the genital wart was the most common presentation with 107 cases (56.4%), followed by genital ulcer, vaginal discharge, and urethral discharge/dysuria. According to the WHO guidelines, mentioned syndromic definitions are compatible with etiologic agents, including human papillomavirus, herpes simplex virus (HSV), *Chlamydia trachomatis*, and *Neisseria gonorrhoeae*.^[11]

In a study conducted by Osinde *et al.*, syphilis (64.3%), mixed infections (13.6%), gonorrhea (9.7%), chlamydia (7.1%), and trichomonas vaginalis (3.3%) have been the most common STIs in Uganda.^[13] According to Shobeiri and Nazari out of 540 Iranian women with vaginitis, the prevalence of candidiasis, trichomoniasis, and bacterial vaginosis was reported 17.2%, 18.1%, and 28.5%, respectively.^[14] A meta-analysis in Taiwan showed that the average annual rate of STIs was higher in women, as well as the annual incidence rates of syphilis, genital warts, and chlamydia infection have increased in young

men.^[15] Heiligenberg identified that 16% of homosexual men infected with STIs, of which chlamydia trachomatis and syphilis were the most common STIs.^[16]

Our study showed that 19.8% of the participants with STIs had a history of unsafe sexual contact and 87.9% did not use condoms during sexual contact. The results of a study indicated that high-risk sexual behaviors are continued in patients with STI,^[17] and it is important to know that condoms only make limited protection against HIV transmission.^[18] Although, according to some studies, consistent use of condoms was effective in preventing STIs,^[1,9] using a condom by women, who are at risk for HIV infection, is influenced by some causes, including environmental, structural, interpersonal factors, also social supports, and at the last low tendency of men to condom use.^[8]

More than 30 different pathogens, including bacteria, viruses, and parasites, have been known to be transmitted through sexual contact.^[1] HIV is transmitted through the gutting of contaminated blood products, needle/syringe sharing, mother to child, and sexual contact.^[13] In recent years, after the concentric epidemic of HIV/AIDS among IV drug users, one of the most important health concerns is the extent of this infection throughout other parts of the community via high-risk sexual behaviors.^[19,20] High-risk sexual behaviors and STIs are more common among patients with HIV infection than non-HIV infected people.^[21] In a meta-analysis study, Reda *et al.* reported that the recurrence rates of genital herpes and also chlamydia, gonorrhea, and candidiasis as the causes of STIs were more common among women with HIV.^[22] Chen *et al.* identified that HSV, syphilis, and genital warts were the most common types of STIs among people living with HIV.^[15]

In the present study, 1% of the patients with STDs were positive for HIV. Worldwide, 0.8% (0.6%–0.9%) of adults aged 15–49 years are living with HIV at the end of 2017.^[23] In Iran, since 2010, new HIV infections have increased by 21% and reached 66,000 (37,000–120,000) until 2016.^[6] People, who inject drugs, have the most prevalence of HIV (13.8%).^[20] Female sex workers are the second most-known HIV-positive population (5%) and prisoners are the third important population (1.4%) in Iran.^[19,24,25] The finding of 1% HIV indicates the presumably significant prevalence of HIV in the mentioned group. To sufficient case detection, it seems rational that all of the health centers pay more attention to the screening of special populations such as IV drug users and sex workers, and according to our study, all of the patients with any symptoms and signs of STDs. Currently, HIV screening plans among STI patients do not seem to be run properly in Iran. In a study, while 70% of midwives received STIs education, however, only 6.3% of them were aware of the STI guidelines.^[26] Improving the knowledge, attitude, and life skills of the collegian students chiefly regarding women's reproductive

health seems to be necessary. Health education is the most effective manner to control HIV infection, and for this purpose, high-risk and vulnerable groups should remain in priority.^[27]

Conclusion

Our finding suggests that Iranian patients with any STDs, similar to other important groups such as IV drug users, sex workers, and prisoners, should be considered as a grave source of spreading HIV infection and therefore should be screened seriously for HIV.

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Conflicts of interest

There are no conflicts of interest.

References

1. Nasirian M, Kianersi S, Hoseini SG, Kassaian N, Yaran M, Shoaei P, *et al.* Prevalence of sexually transmitted infections and their risk factors among female sex workers in Isfahan, Iran: A cross-sectional study. *J Int Assoc Provid AIDS Care* 2017;16:608-14.
2. Latifi A, Merghati-Khoei E, Shojaeizadeh D, Nedjat S, Mehri A, Garmaroudi G. Theory-based interventions in STIs/HIV Prevention: A systematic review of the literature in Iran. *Med J Islam Repub Iran* 2017;31:131.
3. Goya MM, Tayeri K, Kazeroni PA, Farhoudi B, Sori T, Emadi H, *et al.* Country Guide for the Care and Treatment of Sexually Transmitted Infections. 1st ed. Tehran: Andishmand; 2015. p. 13-173.
4. Brownstein PS, Gillespie SE, Leong T, Chahroudi A, Chakraborty R, Camacho-Gonzalez AF. The association of uncontrolled HIV infection and other sexually transmitted infections in metropolitan Atlanta youth. *Pediatr Infect Dis J* 2015;34:e119-24.
5. Nasirian M, Baneshi MR, Kamali K, Haghdoost AA. Estimation of prevalence and incidence of sexually transmitted infections in Iran; A model-based approach. *J Res Health Sci* 2015;15:168-74.
6. Unaid.org. (2019). Homepage. [online] Available at: <http://www.unaids.org/en> [Accessed 19 Jan. 2019].
7. Shokoohi M, Noori A, Karamouzian M, Sharifi H, Khajekazemi R, Fahimfar N, *et al.* Remaining gap in HIV testing uptake among female sex workers in Iran. *AIDS Behav* 2017;21:2401-11.
8. Lotfi R, Ramezani Tehrani F, Salehifar D, Dworkin SL. Predictors of Condom Use Among Iranian Women at Risk of HIV. *Arch Sex Behav* 2016;45:429-37.
9. Rostami F, Shokoohi M, Bamimore MA, Nasirian M, Asadi-Aliabadi M, Haghdoost A. Prevalence of sexually transmitted infections based on syndromic approach and associated factors among Iranian women. *Iran J Health Sci* 2017;5:1-12.
10. Mozafari M, Mayer KH. Social change and HIV in Iran: Reaching hidden populations. *Lancet HIV* 2017;4:e282-3.
11. Guidelines for the Management of Sexually Transmitted Infections 2004. 2. Treatment of STI-Associated Syndromes: 2.2. Genital Ulcer; 2019. Available from: <http://apps.who.int/medicinedocs/en/d/Jh2942e/3.2.HTML>. [Last accessed on 2019 Jan 19].
12. Themba G, Ginindza, Cristina D, Stefan, Joyce M, Tsoka-Gwegweni, Xolisile Dlamini, Pauline E Jolly, Elisabete Weiderpass, *et al.* Prevalence and risk factors associated with sexually transmitted infections (STIs) among women of reproductive age in Swaziland. *Infect Agent Cancer*. 2017; 12: 29. doi: 10.1186/s13027-017-0140-y
13. Osinde MO, Kakaire O, Kaye DK. Sexually transmitted infections in HIV-infected patients in Kabale Hospital, Uganda. *J Infect Dev Ctries* 2012;6:276-82.
14. Shobeiri F, Nazari M. A prospective study of genital infections in Hamedan, Iran. *Southeast Asian J Trop Med Public Health* 2006;37 Suppl 3:174-7.
15. Chen YC, Liu HY, Li CY, Lee NY, Li CW, Ko WC, *et al.* The rising trend of sexually transmitted infections among HIV-infected persons: A population-based cohort study in Taiwan, 2000 through 2010. *J Acquir Immune Defic Syndr* 2015;68:432-8.
16. Heiligenberg M, Rijnders B, Schim van der Loeff MF, de Vries HJ, van der Meijden WI, Geerlings SE, *et al.* High prevalence of sexually transmitted infections in HIV-infected men during routine outpatient visits in the Netherlands. *Sex Transm Dis* 2012;39:8-15.
17. Castro JG, Alcaide ML. High rates of STIs in HIV-infected patients attending an STI clinic. *South Med J* 2016;109:1-4.
18. Stolaroff-Pépin A, Speck RF, Vernazza P. Prevention of HIV and other sexually transmitted infections (STI). *Ther Umsch* 2014;71:515-23.
19. Sharifi H, Mirzazadeh A, Shokoohi M, Karamouzian M, Khajekazemi R, Navadeh S, *et al.* Estimation of HIV incidence and its trend in three key populations in Iran. *PLoS One* 2018;13:e0207681.
20. National AIDS Committee Secretariat, Ministry of Health and Medical Education. On Monitoring of the United Nations General Assembly Special Session on HIV and AIDS. Islamic Republic of Iran, AIDS Progress Report; 2015.
21. Eaton EF, Hudak K, Muzny CA. Budgetary impact of compliance with STI screening guidelines in persons living with HIV. *J Acquir Immune Defic Syndr* 2017;74:303-8.
22. Reda S, Gonçalves FA, Mazepa MM, De Carvalho NS. Women infected with HIV and the impact of associated sexually transmitted infections. *Int J Gynaecol Obstet* 2018;142:143-7.
23. World Health Organization. HIV/AIDS. World Health Organization; 2019. Available from: <https://www.who.int/gho/hiv/en/>. [Last accessed on 2019 Jan 19].
24. Shokoohi M, Karamouzian M, Khajekazemi R, Osooli M, Sharifi H, Haghdoost AA, *et al.* Correlates of HIV testing among female sex workers in Iran: Findings of a national bio-behavioural surveillance survey. *PLoS One* 2016;11:e0147587.
25. Moayedi-Nia S, Bayat Jozani Z, Esmaeeli Djavaid G, Entekhabi F, Bayanolhagh S, Saatian M, *et al.* HIV, HCV, HBV, HSV, and syphilis prevalence among female sex workers in Tehran, Iran, by using respondent-driven sampling. *AIDS Care* 2016;28:487-90.
26. Pourmarzi D, Sharami SH. Midwives' educational needs and knowledge about sexually transmittable infections in the Islamic Republic of Iran. *East Mediterr Health J* 2017;23:611-8.
27. Milani HS, Azarghashb E. Knowledge and attitudes of female students who live in Tehran dormitories, towards STDs and sexual relationships. *Iran J Clin Infect Dis* 2011;6:35-40.