Acceptability of HIV Rapid Testing in Diverse Clinical Settings in Iran

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Abstract: *Introduction*: Rapid HIV testing in clinical settings can identify previously undiagnosed persons and link them to care, as well provide patients with knowledge of their serostatus and risk reduction counseling. We conducted a survey to characterize factors affecting the acceptance or declining of rapid HIV testing among Iranian patients.

Methods: This cross-sectional survey was conducted from October 2014 to December 2014 with patients in three different health care centers (an emergency department in an urban hospital, a rural health centre, a voluntary counseling and testing centre (VCT) within Imam Khomeini Hospital, Tehran, Iran and a rural health centre). Participants completed a semi-structured face-to-face questionnaire and were tested by an HIV rapid test (Chembio Sure Check).

Results: Of 222 participants, 25 participants were from the urban emergency department, 40 from the urban VCT program, and 157 from the rural health care centre. All did the rapid HIV test; all were HIV negative. HIV-related risk profiles found the urban emergency department patients more likely to have multiple partners (26%, P<0.01) and history of sexually transmitted diseases (27%, P<0.001) compared to VCT patients (9% and 3%, respectively) and rural clinic patients (4% and 1%, respectively). Emergency department patients were also more willing to pay for a HIV rapid test (44%, P<0.01), doing a rapid self-test at home (84%,P=0.01), preferring pharmacies as a place for providing rapid tests (80%, P=0.001). Also level of participants' awareness was considerably different between mentioned centres (median=11, 12, 10 for emergency department, VCT and rural Health care centre respectively; P=0.012).

Conclusions: Increasing knowledge about HIV rapid testing, its availability, and keeping costs low can expand the desire to use the test and ultimately prevent the spread of HIV through lack of knowing one's serostatus and lack of treatment. Emergency departments in urban Iran may be an opportunity to test persons at high risk for HIV infection.

Keywords: HIV, Rapid HIV testing, Iran.

INTRODUCTION

According to UNAIDS, more than 36 million people are infected with HIV around the world, and 30% of HIV infected individuals are unaware of their HIV status [1]. Almost half of newly-diagnosed HIV infections may come from recently infected people [2]. Because of higher levels of virus in these patients' blood and genital tracts, transmission to their partners occurs more commonly. Early detection can help preventing new HIV infections [3-5].

There are several priorities and new strategies for advancing HIV prevention and decreasing the epidemic. These include making voluntary HIV testing a routine part of medical care, early infection detection for partners of HIV-positive individuals [6], and expanding public access to diagnostic services. Diagnosis is also the first step for providing care and treatment for HIV [7, 8].

HIV rapid testing is a new approach for earlier diagnosis that can be done in many settings [9]. The HIV rapid test device is a simple tool that does not require a high-level laboratory. The HIV rapid test decreases the anxious time awaiting results. It can also be done in the home as a self-test. However, there may still be the need for professional consultation for positive or negative results [10].

Despite the benefits of early diagnosis to the individual and public health, determinants promoting or preventing HIV testing remain. HIV testing is influenced by demographic factors such as gender, age, urban residency, and marital status [11]. Waiting for results may lead patients not to return to obtain them [12]. Rapid testing can therefore improve the rate of obtaining results. The acceptance of rapid HIV testing in outreach settings has varied from 14% to more than 70% depending on the project and venue [13]. For some national standards, the HIV testing algorithm requires positive sensitive enzyme immunoassay and confirmatory western blot to confirm diagnosis of HIV infection [14]. This process, in Iran for example, takes at least a week. Definite negative results and an initial positive result can be provided by rapid tests typically within an hour. Rapid HIV test can play an important role in HIV prevention activities and expand access to testing in both clinical and non-clinical settings. They can help overcome some barriers to early diagnosis

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and improve linkage to care of infected persons [17]. Rapid HIV tests are now recommended in venues where individuals may not return for their test results or when they cannot wait for test results, situations that may be particularly true in resource-constrained settings [18].

The other important factors for laboratory testing are sensitivity and specificity and according to evaluation of rapid HIV tests, researchers found that all characteristics of HIV rapid tests are needed to be evaluated with serologic tests [9, 19]. Reactive rapid tests are considered to be preliminary positive results and must be confirmed by a western blot or other tests. Those who have reactive rapid tests should provide specimens for confirmatory testing and return to receive their confirmatory test results. HIV counseling and testing staff have opportunity to immediately provide post-test counseling for these individuals and link them to the appropriate medical and support services [20].

Owing to the importance of HIV testing availability for all individuals in the society and the need to decentralize test venue, we should review government policies in point of care testing and find cost effective ways in order to control this disease. Understanding community members' knowledge about the disease and HIV rapid tests availability and also the price are the factors being evaluated in the study to make this type of test be used in wider diagnostic patterns.

METHODS

This cross-sectional study was conducted between October 2012 and December 2012 and contained cross-sectional collection of blood samples and questionnaires.

According to time-location sampling, we studied 3 venues which were included; Emergency Department in an urban hospital, a rural health care center located in the western section of Iran and a Voluntary Counseling and Testing Center (VCT) in Imam Khomeini hospital. Participants were asked to complete a semi-structured questionnaire consisting of; HIV risk behaviors, HIV testing history, awareness and interventions after exposure to HIV and acknowledgment and behavior toward HIV Rapid Testing.

Study Population

Participants were selected according to the following inclusion criteria: aged 18 years old or older, have desire to participate in the study and to be self-reported if they are HIV negative or unaware about their HIV status. The exclusion criteria were being physically or mentally unable to give informed consent or complete the questionnaire and showing signs of excessive drug or alcohol use. Sample selection was performed through time-location sampling principles. The potential respondents were asked to participate and if they agreed, written informed consents were obtained. Participants were asked to complete the required questionnaire. The questions were designed to gather data on socio-demographic characteristics, knowledge about HIV/AIDS, history of high risk behaviors, history of HIV testing and intervention after exposure to HIV/AIDS. The questionnaire took approximately 20 minutes to complete.

Laboratory Testing

Blood samples were analyzed by the AIDS reference laboratory of the Iranian Research Center for HIV/AIDS, using rapid test (Chembio diagnostic systems, INC, USA) for confirmatory test we used CE approved ELISA. All data and samples were collected anonymously and participants and their corresponding questionnaires were assigned to a unique code.

Statistical Analysis

Data were analyzed with SPSS 16 software. Differences in proportions and means among different groups were tested for statistical significance using analysis of chi-square test and kruskal-wallis test. In this paper, P-values were given for the overall significant differences among the three venues and 0.05 was considered as the level of significance.

Ethical Considerations

The study protocol was in compliance with the Declaration of Helsinki and Tokyo guidelines and the human subjects review board of Tehran University of Medical Sciences approved it. In order to consider ethical issues, the study subjects were assured that all collected data would be kept confidential.

Rapid HIV Test

Chembio's SURE CHECK HIV 1/2 Assay combines collection and testing device for the detection of HIV 1 and 2 antibodies. SURE CHECK is approved by Food and Drug Administration (FDA) and test results would be ready in 15 minutes.

RESULTS

Characteristics of the Study Sample

Of 222 participants that filled out questionnaires, 25 participants were in emergency department (Urban place), 157 in rural place and 40 in the Voluntary Counseling and Testing Center (VCT) of Imam Khomeini Hospital in Tehran. The sample was comprised of more females (n =133) than males (n =89). Greater than half of the participants were married (n=163) and rest of them were single, divorced or widow. Most of the participants had no academic (university) education (n=163). The majority of participants did not have multiple partners and sexual intercourse without condom was not mentioned by any of them; history of Sexual Transmitted Disease (STD) was not mentioned by any of the participants. More than 50% (n=172) reported never being tested for HIV/AIDS before this study enrollment (Table **1**).

Chi-square test was performed to analyze differences of HIV rapid test studied factors among three centers in emergency department, VCT and a rural area. There was no considerable relationship between most of the demographic variables however, we found that there was significant relationship between having multiple partner and also history of STD in three settings (p<0.001). In the urban facility, having multiple partners and history of STD were reported more than other settings (Table **1**).

In addition, we indicated that in the rural area, people had HIV testing less than VCT and emergency department (p=0.016). Also, we found that regarding to budgeting for HIV rapid test, participants in VCT and rural setting reported spending more money than emergency department that represented urban setting (p<0.001) (Table **2**).

The analysis showed that regarding willingness to use HIV rapid test at home, people in rural area had less agreement than VCT and emergency department participants (p=0.009). Based on providing HIV rapid test, we indicated that there were significant differences among these three settings, participants in VCT and emergency department preferred to acquire rapid tests from general pharmacies (p=0.001). Furthermore, we illuminated that there were no significant relations between these three settings regarding the accessibility of HIV rapid test; a majority of participants welcomed the idea of HIV rapid tests being openly available in every pharmaceutical setting across the region (Table **2**).

DISCUSSION

Rapid HIV testing acceptance or decline is related to many factors. In this study regarding to importance of HIV screening and extensive use of rapid HIV test, we evaluated patients' characteristics who accept and decline HIV testing. We indicated that in the studied

Table 1: Demographic and sexual risk characteristics of patients seem in three health care settings, Iran, 2012 (N=222)

Variable	Urban emergency department n (%)	Voluntary testing site, urban hospital n (%)	Rural health center n (%)	p-value
Total	25 (100)	40 (100)	157 (100)	--
Age, mean years (range)	36 (20-70)	32 (21-49)	32 (17-65)	0.25*
Sex				
Male	14 (56)	13 (33)	62 (40)	0.16
Female	11 (44)	27 (68)	95 (61)	
Education				
Basic	20 (80)	29 (73)	114 (73)	0.73
University	5 (20)	11 (28)	43 (27)	
Marital status				
Single	8 (32)	11 (28)	25 (16)	0.02
Married	16 (64)	25 (63)	122 (78)	
Divorced/widowed	1 (4)	1 (3)	6 (4)	
Multiple sex partners	6 (26)	3 (9)	5 (4)	<0.01
History of sexually transmitted disease	6 (27)	1 (3)	1 (1)	<0.01
Sexual contact without a condom	7 (32)	5 (15)	33 (24)	0.30

Level of significance p<0.05; analysis was performed Chi-square test, except *by Kruskal-Wallis test.

Table 2: Attitudes Concerning the HIV Rapid Test among Patients Seem in Three Health Care Settings, Iran, 2012 (N=222)

Variable	Urban emergency department n (%)	Voluntary testing site, urban hospital n (%)	Rural health center n (%)	p-value
Total*	25 (100)	40 (100)	157 (100)	--
Participants' familiarity with HIV rapid test prior to this study				
Familiar	7 (28)	12 (30)	20 (13)	0.02
Unfamiliar	18 (72)	26 (65)	131 (83)	
Missing, other	--	2 (5)	6 (4)	
Willingness to spend on a single test				
Nothing	9 (36)	22 (55)	104 (66)	<0.01
≤$1 US	11 (44)	4 (10)	5 (3)	
$1 - $2	4 (16)	3 (8)	24 (15)	
Missing, other	1 (4)	11 (28)	24 (15)	
Willingness to do rapid test at home				
Yes	21 (84)	24 (60)	83 (53)	<0.01
No	3 (12)	14 (35)	68 (43)	
Missing, other	1 (4)	2 (5)	6 (4)	
Preferred place for providing rapid testing				
Pharmacy	20 (80)	22 (55)	68 (43)	<0.01
Referral center	2 (8)	11 (28)	65 (41)	
Missing, other	3 (12)	7 (18)	24 (15)	
Ideal location for acquiring a Rapid Test				
Everywhere	19 (76)	23 (58)	101 (64)	0.77
At pharmacies	6 (24)	12 (30)	47 (30)	
Missing, other	--	5 (13)	9 (6)	

*Categories calculated as a percent of the total; total is not always 100% due to missing, unknown, and other minor responses not shown.

settings, participants' opinions differed on several factors; their willingness to spend on HIV rapid tests, their preferred location and their comfortability to perform this test in a domestic environment.

In Freeman study, 91% of south-eastern emergency department patients accepted HIV test suggestion. In the mentioned study, married patients were less likely to accept testing than those who were African American and unmarried (p<0.001). Testing refusal decreased as patients' age as ascended (OR = 0.71; 95% CI = 0.59 to 0.85) [19]. In another study that was conducted as in-depth interview for understanding patients' acceptance and refusal of HIV testing in California emergency department curiosity, reassurance of negative status, convenience and opportunity were factors for acceptance of performing HIV testing. Emergency department (ED) is considered to be a primary setting for patients who do not have access to affordable health care programs therefor, it has made it an ideal location for screening programs implementation [20].

In our study, most of the participants in Emergency Department in urban hospital had no tendency to be tested in their ED visits which could be influenced by their chief complaints during their length of stay. The most common reasons for declining rapid HIV testing among ED patients in Schechter-Perkins EM's study in 2014 was "no perceived risk" ,"tested in the last three months" and age (less than age 35) [21].

Most of general population in two largest Spanish scientific medical societies for family and community medicine were aware of the existence of rapid tests but they did not know how to use. They were also willing to do the test if being suggested and confident in the results obtained by rapid HIV testing; however, the need for pre- and post-test counseling were felt among them [22].

Rapid HIV testing can decrease number of antiretroviral post-exposure prophylaxis regimens among who are waiting for HIV test results. In a short report about benefits of rapid HIV test for evaluation of the source patient after occupational exposure of healthcare workers by Puro *et al.*, the results significantly showed that the test is the useful tool for evaluation of the source patient after an occupational exposure [23]. Also among health workers who were exposed to HIV, good correlation of the rapid test with ELISA, the shorter duration of stress and the absence of exposure of the health worker to the adverse effects of antiretroviral agents suggest the adoption of this test [24]. In another study among health care workers (HCW) in Kenya, when HIV self-test was available, factors that were positively associated with use of it, were being female; being single; and being a HCW from high HIV prevalence area [25].

According to another study carried out among pregnant women, main factor for declining rapid test was to have prenatal care history but no documentation of rapid test results at labor and delivery. Most of them did not have enough knowledge about benefits of rapid HIV testing and benefit of repeating the test [26]. Among pregnant women in this study, perceived risk and pain of women during active labor could be related to the rate of declining rapid HIV testing [26].

Availability of HIV rapid test is one of factors that should be considered; in this study, we concluded that participants in VCT and emergency department settings (urban place) preferred acquiring rapid tests from pharmacies and availability of the test was considered as an important factor among them, while on the other hand, rural participants preferred referring to government or private hospitals. This may be due to the fact that in rural communities, the structure and mechanism of these tests are newly introduced.

The other important factor being studied was the price of HIV rapid test, sensitivity and specificity of the test are two main factors of the test and clearly higher sensitivity and specificity would add to its price range. In this study, indigenous regions had less desire to pay for the test (39.1% of rural people would pay while 78.2% of urban individuals would pay for it), however, a significant number of urban people preferred paying no money as well. It is believed in many urban areas that the expenditure of this test should be burdened on medical centers. Therefore, price of the test is a significant factor that should be considered by policy makers.

Furthermore, the last factor was studying the tendency of rural and urban areas on performing the test at home. The rate was higher in urban settings, however, both settings preferred being visited by clinicians after getting the result (31% and 69% if negative in urban and rural areas and 94% and 98% if positive in urban and rural settings respectively).

CONCLUSIONS

Participants in this study appreciated HIV rapid testing and voluntary HIV testing as a routine part of medical care. This can implement new models for diagnosing HIV infections outside medical settings. Increasing knowledge about HIV virus and its diagnostic testing especially HIV rapid tests are very important. Two important factors that should be considered are availability and affordability of the test which can prevent the spread of infection and increase the benefits of earlier diagnosis.

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