



Point of care HIV testing with oral fluid among returnee migrants in a rural area of Bangladesh

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Objectives

To determine HIV prevalence and assess the acceptability of HIV testing using oral fluid as a point of care (PoC) test method among returnee migrants in a rural area of Bangladesh.

Design

A cross-sectional study.

Methods

Matlab is a rural area southeast of Dhaka where icddr,b hosts a health and demographic surveillance system covering 225 826 people of whom 934 are returnee migrants. The sample size of 304 was proportionately distributed among randomly selected households. HIV antibodies in oral fluid were tested using OraQuick Rapid HIV 1/2 antibody test. To understand reasons of acceptability a short questionnaire was applied and 32 in-depth interviews were conducted.

Results

Of 304 returnee migrants approached, 97.4% accepted the test. The prevalence of HIV was 0.3% without a confirmatory blood test. Reasons for acceptance included easy accessibility of the test at the door-step which saved resources (i.e., time and money), comfortable test-procedure without any pain and fear, and receiving quick results with confidentiality. Some described knowing HIV status as a way to 'get certified' (of sexual fidelity) and to confront a prevailing silent stigma against migrants. Acceptability was moreover found to be grounded in icddr,b's institutional reputation and its close relationship with the local community.

Conclusions

The PoC oral fluid test for HIV has shown for the first time that assessment of HIV prevalence in rural-based returnee migrants is possible. Findings also suggest that PoC oral fluid test has the potential of increasing accessibility to HIV testing as it was found to be highly acceptable.

Keywords

acceptability, Bangladesh, HIV, oral fluid testing, point of care, returnee migrants

INTRODUCTION

Bangladesh has contained the spread of HIV and consistently maintained a national HIV prevalence below 0.1% in the general populations [1] and below 1% among key populations [2] considered to be at risk of HIV. Although the number of infections is still low, Bangladesh is one of the four countries in the Asia Pacific region where the epidemic is rising [3]. In 2014, the cumulative number of detected infections was 3674, of which 433 were new cases [4]. The current estimated number of people living with HIV is 9500 (range 4100–97 000) [5].

The two main sources of information on HIV in Bangladesh are the national HIV surveillance and case reporting from HIV testing and counselling

(HTC) centres. HIV surveillance which is conducted among key populations shows that the epidemic is

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concentrated among people who inject drugs (PWID) in one neighbourhood of Dhaka with 5.3% prevalence [4]. Data from HTC centres in 2012 and 2013 show that of the HIV positive cases 35–40% were found in returnee migrants (Dr Anisur Rahman, National AIDS/STD Programme, personal communication). Recent data from the HTC unit of the International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b) showed that the vast majority of HIV positive returnee migrants travelled to the Middle East and other countries in South East Asia for employment [6]. Thus PWID and returnee migrants contribute most to the HIV cases in Bangladesh.

The risk of HIV associated with migration and mobility is related to the behaviour of individuals and not to migration itself and the exact role of migration to HIV prevalence has been debated [7]. Studies in different settings have shown that migrants practice risky behaviours while living abroad. A study in two rural areas of Bangladesh showed that commercial sex was more common among men who had gone abroad for work compared to those who remained at home [8]. In South Africa, sexual risk behaviours were significantly more common among nonresidents than in residents for both men and women [9]. There are many reasons why migrants practice risky behaviours while abroad [10–12] and understanding those factors in a given context is essential for designing effective programmes.

In Bangladesh, harm reduction services are available for PWID [13] but comprehensive HIV prevention services are not available for returnee migrants. Moreover, there has not been any systematic survey to determine the HIV prevalence among returnee migrants. This is because once migrants return from abroad they merge with the general population and as Bangladesh is a low prevalence country for HIV, general population surveys on HIV are not conducted. The only source of information on returnee migrants is through HTC services. However, HTC coverage in Bangladesh is among the lowest in the Asia Pacific region [14]. Even in countries where HTC services are widely available, uptake can be low. The reasons for low HTC uptake are several, including stigma and discrimination, confidentiality, distance to the facility, lack of information, health workers attitude, etc. [15,16]. Another barrier is the reported discomfort, pain, and fear of giving blood that comes with traditional blood-based tests [17,18].

In 2004, the US Food and Drug Administration approved the first rapid oral fluid testing (OraQuick HIV Rapid Antibody Test; OraSure Technologies Inc., Bethlehem, Pennsylvania, USA), for HIV as a convenient point of care (PoC) testing option with the possibility of obtaining test results

within 20–40 min [19]. Some studies showed high sensitivity (99.1–100%) and high specificity (99.6–100%) to the PoC oral fluid test for HIV and performance was similar to, or better than that of blood-based conventional tests [20,21]. Some countries have reported this test to be effective to overcome some of the barriers associated with the uptake of HTC [17,18]. In Bangladesh, an evaluation of the test kit was conducted in 2012 among known HIV-positive and negative individuals (100 each) in Dhaka and the sensitivity and specificity of the kit was found to be 100 and 99%, respectively (Dr Sabrina Rasheed, icddr,b, personal communication).

Given the need to better understand the burden of HIV among returnee migrants, this study was undertaken to gauge the prevalence of HIV through a random survey conducted among returnee migrants in a rural area of Bangladesh. In addition, to overcome some of the obstacles related to HIV testing, an oral fluid-based PoC HIV rapid test was taken to the doorstep of the returnee migrants and the acceptability of the PoC oral fluid test was also assessed.

METHOD

Sampling area and population

Returnee migrants were defined as those who went overseas for work since 2005 and had returned home either permanently or temporarily. Returnee migrants were recruited from Matlab which is situated 55 kilometer southeast of Dhaka city and serves 142 villages covering a population of 225 826. The icddr,b operates a health and demographic surveillance system (HDSS) in Matlab that collects bi-monthly demographic data, including on migration [22]. According to the HDSS data, in 2014 the area had 934 migrants who had returned from the Middle East and other Asian countries since 2005 (Mr. Taslim Ali, icddr,b, personal communication). The availability of such information from Matlab allowed the development of a sampling frame.

Returnee migrants, either men or women, who fulfilled the definition, who were between 18–64 years of age and residing in the HDSS area of Matlab were enrolled into the study. Acceptance was measured by the proportion consenting to take the test, taking the test, and receiving the test result.

Sampling method

Initially, the villages with 934 returnee migrants were identified from the existing data set and the calculated sample size of 304 was proportionately distributed among those villages. The participants

were then enrolled randomly from the selected households of those villages. Study counsellors checked the inclusion criteria and obtained written informed consent prior to enrolment. Pretest counselling was conducted using a semi-structured questionnaire. HIV test was then performed using oral fluid through OraQuick ADVANCE Rapid HIV-1/2 Antibody test on the spot. After testing, a second semi structured questionnaire was administered to evaluate reasons for acceptance of the test. Those who refused to participate in the study were asked about reasons for declining. HIV-negative test results were given to the participant immediately through posttest counselling. There was provision for further confirmation of the oral fluid tested positive results through WHO recommended three rapid blood-based tests at a nearby health facility.

Using an exploratory design, a qualitative method was also applied to capture underlying reasons for acceptance of the oral fluid test for HIV. A maximum diversity sampling approach was employed to purposively select a set of diverse participants to obtain various views on the test. Major sampling criteria included demographic features (e.g. age, sex, education, and marital status), status of migration (i.e. whether the study participant returned home permanently, temporarily, or undecided), length of overseas stay, previous exposure to HIV test and geographic regions visited outside Bangladesh. With the assistance of a focused and brief open-ended interview guideline, face to face in-depth interviews were conducted with 27 men and 5 women as at that point information became saturated. Interview was digitally recorded with permission of the participants and where not possible, hand notes were taken.

Data analysis

Data collected were double entered by Epi Info (Version 3.5.1). Percentages were reported for categorical variables and means for numerical variables. For both categorical and numerical variables 95% confidence interval (CI) was reported. For qualitative data, all digitally recorded data were transcribed, coded, and recoded manually to identify issues, concepts, and themes. Various subthemes were collapsed and categorized under a major theme. Thematic and contextual analysis was performed manually. Peer-debriefing sessions were conducted as part of an ongoing analysis procedure.

Ethical assurance for the protection of human rights

Research Review and Ethical Review Committees of icddr,b approved the survey. Participation in this

study was entirely voluntary and participants were enrolled only if they provided written informed consent. The study procedure was conducted in a private and discreet spot which was identified by the study participant. All questionnaires were assigned a unique ID that was given to each study participant and which was not linked to the name of the individual. Full confidentiality was maintained throughout the process.

RESULTS

Total 304 returnee migrants were approached for enrolment between March and May 2015. Finally, 297 were enrolled and of them, 289 were men and eight were women. All seven who refused to participate were men, four of them did not perceive themselves to be at risk of HIV and three of them were busy. Of the returnee migrants sampled 93.6% (95%CI: 90.2–95.9) were more than 24-years-old with a mean of 36.1 years (95%CI: 35.0–37.1). Mean years of education was 6.4 years (95%CI: 6.0–6.9) and 14.5% (95%CI: 10.9–19.0) had no institutional education. 88.2% (95%CI: 84.0–91.4) of the returnee migrants were married and of them 98.9% (95%CI: 96.5–99.6) were living with their spouses. Majority of the returnee migrants mentioned business (30.6%, 95%CI: 25.6–36.1) and farming (26.6%, 95%CI: 21.9–31.9) as their main source of income in the last month.

Total 72.4% (95%CI: 67.0–77.2) of the migrants returned home permanently and 21.9% (95%CI: 17.5–27.0) were not sure (during the time of interview) whether they would return abroad or stay at home permanently. Mean duration of stay was 5 years (95%CI: 4.5–5.6) in the country where they last worked and their main occupation while abroad included being engaged in the service sector (52.9%, 95%CI: 47.1–58.5), construction work (22.2%, 95%CI: 17.8–27.3) and day labour (12.1%, 95%CI: 8.9–16.4). Only 17.2% (95%CI: 13.3–21.9) reported ever being tested for HIV and of those tested 69.4% (95%CI: 54.7–81.0) knew their test results. Only 2.4% (95%CI: 1.1–4.9) returnee migrants had heard about the PoC oral fluid test for HIV.

Of 304 returnee migrants approached 297 were tested after giving informed consent. Of these, one tested positive but refused to receive the result and to undergo counselling. This result therefore could not be confirmed by a blood test. Based on this, the acceptability of the PoC oral fluid test for HIV was 97.4% (95%CI: 95.3–99.1). If we consider the one case positive by the PoC oral fluid test, the HIV prevalence was 0.3% (95%CI: 0.0–1.9).

Although responding to questions on reasons for accepting the PoC oral fluid test for HIV, the

Table 1. Reasons for accepting the point of care oral fluid test for HIV

Reasons for accepting the test ^a	N = 296, % (95% CI)
Home-based test	75.3 (70.1–79.9)
Easy and rapid test	69.7 (64.2–74.7)
Pain-free test	65.9 (60.3–71.1)
Free of cost	57.1 (51.4–62.6)
Confidential test	22.3 (17.9–27.4)
Test result of icddr,b is acceptable	12.8 (9.5–17.2)
Confidence on the test result	10.8 (7.7–14.9)

CI, confidence interval.

^aRefers to multiple responses.

majority said that they liked it because it was a home-based test (75.3%). Other reasons included, easy and rapid test (69.7%), pain free test (65.9%) and because it was free of cost (57.1%) (Table 1).

Although 84% (95%CI: 79.2–87.8) of the returnee migrants perceived no disadvantage of the test, there were a few who reported some disadvantages such as difficult to maintain confidentiality (8%, 95%CI: 5.4–11.8), risk of stigmatization (7%, 95%CI: 4.5–10.6), and less confidence in the oral fluid-based test compared to blood test (1.4%, 95%CI: 0.5–3.7).

Reasons for acceptance that were revealed through the in-depth interviews were similar to that from the questionnaire and the findings are described in detail below under thematic issues that emerged.

PoC service: Easy accessibility to HIV test at door-step without 'pain and cost' and easy procedure

'The test was done so nicely at home, a big test done, I could not even feel it or need to pay anything, and received the result immediately.' Many participants expressed similar feelings of comfort at being tested at the door step of their homes, which saved time and travel cost. In addition to the test being free and receiving the result rapidly on the spot, it was not painful; there was no need to draw blood, no need to use needle and syringe, and no fear of pain from needle pricking:

'No needle prick, no pain, no fear, no tension, the test was done with such ease that I could not realize the test was completed, it is so convenient, excellent! I believe people will love this test.'

A participant explained: 'I know 100% of the people who will be tested will say good things about this test, I am sure, I personally have not found any negative aspects of the test, no bad aspects.'

First time experience: 'testing through new technology'

Other than a few exceptions, most participants had no experience of HIV test by oral fluid in the past, this was the first time that they had heard that HIV could be tested using oral fluid. One participant said: 'icddr,b has come with this technology, I found this is very interesting, first experience in my life, so I like it.'

'Certification of HIV free status': a means to establish a clean self-image

Two female participants said that the HIV test would be useful for them to establish their 'clean' image. 'Because of my migrant status, people might have thought "bad" of me. Through this HIV test, now people can see I did not engage in any bad things when I was abroad.' A few male participants also claimed that the HIV test result would confirm their good behaviour and help regain their respect. One participant said:

'Why you have selected me for this HIV test, because I lived in a foreign country, so I might have illicit relation (sexual) right? So you have come to test me. Good, do it, I know I did not do any 'illicit' thing there. But today through this test, you will know my status and I can tell people about my HIV free status. I will regain my self-image.'

Thus it is obvious from the above statement that returnee migrants face a 'silent stigma'. Although this was not openly discussed but it was understood while talking to the study participants that they were suffering from a 'silent stigma' against which they could not raise their voice. They found HIV testing might offer them an opportunity to fight against such stigma and this was particularly true for female migrants.

Institutional reputation and trust on the work of icddr,b and of community health research workers was transformed into confidence on oral fluid for HIV test

'We people of Matlab are grateful to cholera hospital (icddr,b). We have been getting health services from icddr,b for a long time. icddr,b did many studies with us for our betterment. You have come to me with 'X' community health research worker (CHRW) who is very close to me, she helps us in many ways, mainly deals with our health problems. You have also nicely described why you have come to me to do what kind of test, etc. So I have no problem, I have faith in you and on icddr,b. Hope you have come to do good for me.'

Similar sentiments were echoed through the voices of many participants. They also believed that 'icddr,b uses certified technology and health services by qualified health providers in Matlab area, so as you have come from icddr,b I believe you as well.'

CHRW belong to the local community who are working for a long time with their own villagers. They provide health information and associated services. Thus they have obtained trust and confidence of villagers. Not only for males, the involvement of CHRW was crucial for female research participants. As reflected in the voice of a female participant: 'she (CHRW) is known to me for quite long time. I believe in her good initiatives. As she has accompanied you, so I also believe you, you are welcome.'

DISCUSSION

A key issue for Bangladesh as a low prevalence country is to be aware of the emergence of new pockets of HIV infection to mount a quick response. For this it is essential that an early alert and response system is in place and such a system requires triangulation of data from different sources [23,24]. In Bangladesh, the data sources that have been used to better understand the epidemic include the national surveillance [2], other studies and surveys [25], HIV prevention program data [26], size estimations [27] as well as HTC data. However, the data is often patchy and there is limited information on certain groups such as returnee migrants. More and more evidence is emerging from Bangladesh that show that returnee migrants need special attention as they report risky behaviours, greater vulnerability, and among whom diverse strains of HIV have been detected [8,28–31]. Such concerns have been raised by other countries in the region such as Pakistan, Nepal, and India [32–34]. However, information on HIV rates among returnee migrants in Bangladesh is only available through case reporting from HTC centres.

The study for the first time has provided evidence that prevalence data on HIV from a random sample of rural-based returnee migrants is possible to obtain. Here HIV was detected in only one person which was not confirmed by a blood test, but we included this as a positive case given that the kit is highly reliable [20,21]. With this in consideration the proportion of HIV positivity is higher than what is reported for the general population (0.3% for returnee migrants compared to <0.1% for the general population). Such a proportion can convert to large numbers when the numbers of migrants employed for work abroad are considered. Bangladesh is a major source country for labour migrants abroad. A total of 9 172 806 people

migrated abroad for employment between 1976 and 2014 and 425 684 were employed abroad in 2014 only [35]. Therefore, understanding the prevalence of HIV among this large population group is an essential component of the alert and response system in order for Bangladesh to remain a low HIV prevalence country. However, given that the test was not confirmed and that only one case was detected in a relatively small sample, it is essential to confirm this in a larger group of returnee migrants with confirmatory blood test.

The survey was possible for a combination of factors – the availability of a database from which a sampling frame could be developed, the use of a PoC nonblood-based HIV-test kit and the long standing relationship of icddr,b with the Matlab community. Previously, similar databases have been used to determine risk behaviours of returnee migrants in two rural areas of Bangladesh [8] but HIV testing was not possible because of the absence of an oral fluid-based PoC test.

The barriers of blood-based tests are several especially in population groups that are hidden and stigmatised [17,18]. The data presented in this study and also from previous studies show that returnee migrants are highly stigmatised especially in the case of women [30,31]. In the current study, despite the enthusiasm shown for the test, concerns regarding confidentiality and stigma were raised and therefore, prior to this, it has been very difficult to either sample them separately in a survey or to bring them to HTC sites. The oral fluid-based PoC test allowed access to these individuals for HIV testing for the first time in Bangladesh and it was found to be highly acceptable for diverse reasons ranging from personal tangible benefits, painless test procedure, and availability of the test and its result at the door step. Such preference for oral fluid-based PoC test has also been reported in a rural hospital and among males who have sex with males and truck drivers in India [36,37], among key populations in Australia [38], clients attending the emergency department in USA [39] and members of the general population in Tanzania [40]. A systematic review for both supervised and unsupervised testing among high and low-risk general populations also recorded high acceptance [41]. The high acceptance rate and positive attitude toward the testing method paves the way for accessing returnee migrants not only for studies but also for HTC and linking to services. However, the major challenge of maintaining confidentiality [16] is not automatically overcome with the oral fluid-based PoC HIV test as in some cases taking the test to the door-step may further complicate the situation. Nonetheless it is a step forward and adoption of this PoC testing

methodology and linkage to antiretroviral therapy could enable Bangladesh toward reaching the global 90–90–90 goals [42].

It is, however, important to keep in mind that rapid expansion of using this method for surveys in different parts of Bangladesh may not be immediately possible. For this study, icddr,b's long standing relationship with Matlab (since 1963) through community outreach workers and from a nearby hospital, allowed easy access and enthusiastic participation from the villagers as was specially obvious from the qualitative data. Whether this will be possible in other rural areas where such trust and confidence in an organisation does not exist is not clear and the fear of breach in confidentiality and stigmatisation may be a barrier. However, this does not automatically imply that HIV testing with oral fluid through PoC always needs institutional support. Procedural comfort of oral fluid test for HIV and bringing this service to the door-step can certainly provide incentives to acceptance.

CONCLUSION

In conclusion, this study has provided an in-road to understanding the HIV prevalence in returnee migrants but as Matlab may not be representative for all of rural Bangladesh, it is important to try and conduct such surveys in other geographical areas especially those that have been identified as migration prone districts [43] as well in a larger sample of returnee migrants. The study, however, does provide enough evidence to suggest that this methodology may be adapted for HTC among returnee migrants.

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Conflicts of interest

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