Fingerprick versus oral swab: Acceptability of blood-based testing increases if other STIs can be detected

Ivan Balán[1], **Timothy Frasca**[1], **Mobolaji Ibitoye**[2], **Curtis Dolezal**[1], and **Alex Carballo-Diéguez**[1]

[1]HIV Center for Clinical & Behavioral Studies, New York State Psychiatric Institute/Columbia University, 1051 Riverside Drive, New York NY 10032

[2]Department of Sociomedical Sciencies, Mailman School of Public Health, Columbia University, 722 West 168 Street, New York NY 10032

Abstract

Self-testing has untapped potential as a strategy to improve access to HIV testing and to increase testing frequency. User acceptability of self-administered oral swab HIV tests is consistently high in both hypothetical and actual-use studies. We explored preferences for oral versus fingerprick HIV self-tests among men who have sex with men (MSM) with a high risk profile. Participants indicated greater likelihood of using an oral swab over a blood-based test, notwithstanding lower price or quicker results from the latter. However, the likelihood of using an HIV fingerprick test substantially increased if it also offered information on other sexually transmitted infections.

Abstract

El uso de las pruebas auto-administradas es una estrategia subutilizada para mejorar el acceso a la prueba para el VIH y para aumentar su frecuencia de uso. La aceptabilidad de las pruebas orales para el VIH es consistentemente alta entre los usuarios en estudios hipotéticos y de práctica. Exploramos las preferencias entre las pruebas orales y de punción digital, de hombres que tienen sexo con hombres (HSH), quienes tienen frecuentes conductas de riesgo. Los participantes indicaron una mayor probabilidad de usar la prueba oral sobre la de sangre, a pesar de ventajas de precio o de rapidez en dar resultados. Sin embargo, la probabilidad de usar una prueba de punción digital para el VIH aumentó sustancialmente si ésa les ofrecía además información sobre otras infecciones de transmisión sexual.

Keywords

self-testing; MSM; HIV testing; STI; fingerprick

Timothy Frasca (corresponding author) (646) 774-6969 < frascat@nyspi.columbia.edu >.
Ivan Balán (646) 774-6936 < balaniv@nyspi.columbia.edu >
Mobolaji Ibitoye (646) 320-8812 < moi2104@columbia.edu >
Curtis Dolezal (646) 774-6908 < dolezalc@nyspi.columbia.edu >
Alex Carballo-Diéguez (646) 774-6930 < ac72@cumc.columbia.edu >

Introduction

Home-based or self-testing is commonly used for diabetes control, pregnancy determination and other medical purposes [1, 2]. Patient acceptability of self-administered procedures for obtaining biological samples such as urine or vaginal swabs is consistently high [2]. Similarly, acceptability of self-testing for HIV is high in both hypothetical [3-5] and actual-use studies [5-10].

HIV self-testing, usually through an oral swab, is perceived as more private and convenient for users [3, 5], more likely to increase testing frequency [3] and to facilitate access to the test by first-time users [7]. Nonetheless, in studies, users express concerns about cost, user error in administration or interpretation [5, 7], failure to include other sexually transmitted infections (STIs) [3], lack of expert support in case of an unfavorable test result [3, 5-7], and lack of easy linkage to clinical treatment when required [3, 9].

Although both fingerprick and oral swab tests are found to be acceptable to potential users, users often prefer the latter [6] because they are perceived as easier to use and painless. On the other hand, users may perceive blood-based tests as more accurate [1, 3], and there is some evidence to support this belief [11]. Overcoming patient resistance to fingerprick tests could open the door to new options for self-administered diagnostics.

User preferences on testing methods are important to guide development of self-testing technologies that will be popular enough to be adopted widely by the target populations. Sexually active men who have sex with men (MSM) may be motivated to adopt self-testing given the high incidence and prevalence of HIV among their peers and thus are an appropriate population with whom to assess user preferences on self-testing technologies. In this study, we explored preferences for oral swab versus fingerprick HIV tests among MSM who regularly engage in condomless anal intercourse in situations in which there is risk of HIV infection to see whether benefits related to cost, speed in obtaining results, or additional diagnostic possibilities might overcome patient reluctance to blood-based tests. We also explored how demographic characteristics and HIV/STI risk perception might affect preference for oral versus blood-based tests.

METHODS

As part of a two-phase study exploring the potential use of HIV self-tests with sexual partners among MSM [8], we asked participants about their preferences for oral swab versus blood-based HIV rapid tests. Recruitment occurred through Internet dating sites and face to face at gay-oriented venues. Participants had to be HIV-negative MSM, 18 years of age or older, sexually active with multiple partners, and report no condom use during receptive anal intercourse on at least 80% of such occasions with partners of uncertain HIV status. Prospective volunteers were asked whether they would test a partner for HIV if they could get a result in 20 minutes. The two studies used identical eligibility criteria with the exception that those entering the second phase had to express likelihood to use self-test kits to test sexual partners.

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants prior to study enrollment. All study procedures were approved by the Institutional Review Board of the New York State Psychiatric Institute.

During their study visit, participants answered a computer-assisted self-interview (CASI) that included questions about demographics, sexual practices, substance use, HIV testing history, and self-efficacy of using HIV self-tests with partners. To assess testing preferences we showed participants pictures of a rapid oral swab (Test A) and a rapid, blood-based, fingerprick test (Test B) and asked them to rate their likelihood to use each test if they cost the same, using a scale ranging from 0 "extremely unlikely" to 10 "extremely likely." We then presented each participant with the number he chose to reflect the likelihood of using Test A and asked him to indicate the likelihood of using Test B if, compared to Test A, it cost half as much, provided results in half the time, or also tested for other STIs.

Numerous assessments of HIV risk perception were incorporated into the CASI. First, participants were asked to rate separately their likelihood of acquiring HIV or an STI "in the near future" on a 10-point scale (1=extremely likely-10=extremely unlikely). They were also asked, "When you consider everything that matters to you about your sex life, how much do you plan to do to avoid getting HIV?" with a 10-point scale of response options from 1 ("I'll do nothing to avoid getting HIV") to 10 ("I'll do everything to avoid getting HIV, even not having sex"). Participants were also asked about their history of STIs and the number of prior HIV tests.

After preliminary analyses showed no significant differences between the two groups of participants with regard to demographics or preferences for oral or finger-prick HIV tests, the two groups were combined. Paired t-tests were used to compare likelihood to use an oral swab with the four Test B scenarios. In addition, the association between likelihood of use and potential covariates were tested using Pearson correlations (for continuous variables age, education, times tested for HIV, perceived risk of HIV, perceived risk of STIs, and extent to which they take action to avoid HIV), ANOVAs (for categorical variable race/ethnicity), and t-tests (for a dichotomous variable, ever had/never had an STI).

RESULTS

Participants were an ethnically and racially diverse sample of which 28% (n=23) were White, 31% (n=26) were Latino, 33% (n=27) were African-American, and 8% (n=7) were classified as Other. Average age was approximately 34 years (SD=11.8). One third (33%) were college graduates, and another 42% had attended some college; however, 40% were unemployed. They reported frequent HIV testing (lifetime average 8.3 times, SD=10.1, range=0-50), and 56% reported having acquired an STI at least once.

On average, participants reported a lower mean likelihood of using the fingerprick test (4.99, SD=3.53) as compared with the oral swab (9.33, SD=1.83) when these were assumed to cost

the same (p<.001). A hypothetical savings of half the cost boosted the blood-based test's likelihood of use to a mean of 6.11 (SD=3.48), and the possibility of obtaining results in half the time raised the mean likelihood of use to 6.35 (SD=3.62). However, the possibility of diagnosing other STIs along with HIV using the fingerprick test shifted the mean likelihood-to-use response to 8.10 (SD=2.96). Sixty percent of respondents indicated that they were extremely likely to use a fingerprick test that also diagnosed other STIs.

Participants perceived their own risk of contracting another STI or HIV to be relatively low (M=3.8 and 3.7 respectively on a 10-point scale) and rated their determination to avoid HIV infection (M=6.8) relatively high. Those rating their determination to avoid HIV infection higher indicated greater likelihood to use a blood-based HIV test (r=.293, p=.008) especially if it were less expensive than the oral swab (r=.373, p=.001). This variable also showed a trend toward greater acceptability in the case that the blood test were capable of detecting other STIs (r=.204, p=.068) although it did not reach statistical significance.

More frequent testers were significantly more likely to want to use a fingerprick test (r=.249, p=.026) and showed a trend toward greater acceptability of the STI-detecting fingerprick test (r=.195, p=.082) while those with higher educational attainment showed less acceptance of a blood-based test overall, including one that detected other STIs (r=-.237, p=.032). The more highly educated participants also expressed that they planned to do less to avoid HIV infection in the future (r=-.308, p=.005). Age, race/ ethnicity, and estimated likelihood of acquiring a future STI or HIV were not significantly associated.

DISCUSSION

Participants in our study were less enthusiastic about self-testing when it involves extracting a blood sample through a fingerprick. However, this reluctance was reduced noticeably when the test offered information about STIs other than HIV. More frequent testers and those with a higher level of concern about HIV appeared more likely to consider a fingerprick test. On the other hand, those with higher educational attainment showed less interest in the fingerprick test, even if it offered information on other STIs. Nonetheless, our results suggest that user resistance to blood sampling for self-testing may not be insurmountable, and such tests may be a potent tool for STI diagnosis and control.

Given the increased use of HIV prevention strategies, i.e., pre-exposure prophylaxis, that work in the absence of condoms, users may turn their attention to avoiding other endemic STIs. The ease and convenience of self-administered tests are strong incentives, but potential users of HIV self-tests identified the inability of currently available tests to detect other STIs as a serious shortcoming [3]. The widespread incidence of common STIs and the recent spike in syphilis incidence in the U.S. could further enhance consumers' interest in products that offer more than an HIV result.

To this end, work is currently underway to develop a self-administered, multiple STI test using existing technology to process blood samples and download the results quickly through a cellphone application [11]. For some users, the testing scenario may evolve in

such a way as to provide them with new and attractive options to monitor their disease-avoidance strategies.

An unexpected finding in this study was that participants with higher educational levels were less accepting of the blood-based test despite its hypothesized additional advantages. While the small sample size in this study limits exploration into this result, more highly educated men might have greater medical resources at their disposal and thus prefer to be tested through their providers, especially when facing an unusual or complicated scenario. Similarly, their lesser commitment to action to avoid HIV infection may reflect decreased concern about HIV as it becomes a more manageable condition for those with access to healthcare resources or greater confidence in their own risk-avoidance strategies.

The study is limited by the small and unrepresentative sample size. Participants specifically were sought for a study on the use of a rapid HIV oral swab because of their expressed interest in the technology. Also, they had a higher level of educational attainment (approximately 75 percent had some college education) than might be expected from a random population sample. As they were actively exploring alternative strategies for avoiding HIV infection via their participation in the study, they may have been more favorably disposed to the idea of self-testing than other MSM.

Lastly, self-reported acceptability is no guarantee of uptake of any product or behavior; thus whether expressed behavioral intentions actually are enacted is a key question for the future that could be studied with a larger group. Nevertheless, the interest among our respondents in adding STI detection to the home-testing arsenal is encouraging and suggests that specific product enhancements may provide sufficient added value to increase the acceptability of fingerprick tests among self-testers.

Acknowledgments

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Table 1

Correlates of likelihood to use HIV tests (N=82)

	Oral swab	Finger prick	Finger prick half cost	Finger prick faster	Finger prick STIs
	r (p)	r (p)	r (p)	r (p)	r (p)
Age	.018 (.873)	−.102 (.363)	−.041 (.713)	−.078 (.487)	−.167 (.135)
Education	.197 (.076)	−.208 (.061)	−.095 (.394)	−.123 (.272)	−.237 (.032)[*]
Income	.047 (.716)	−.018 (.887)	−.006 (.965)	−.101 (.429)	−.041 (.749)
Times tested for HIV	−.182 (.106)	.249 (.026)[*]	.195 (.082)	.185 (.101)	−.002 (.989)
Perceived risk of HIV	.005 (.962)	.005 (.964)	−.100 (.386)	.079 (.496)	.069 (.553)
Perceived risk of STI	.212 (.061)	−.025 (.825)	.009 (.937)	.104 (.361)	.095 (.406)
Actively avoiding HIV	−.241 (.030)[*]	.293 (.008)[**]	.373 (.001)[**]	.205 (.067)	.204 (.068)

[*] p <.05

[**] p <.01