Female Sex Workers Often Incorrectly Interpret HIV Self-Test Results in Uganda

To the Editors:

BACKGROUND

HIV testing is important among female sex workers (FSWs) because they are at increased risk of HIV acquisition compared with members of the general population. The World Health Organization recommends that FSWs retest for HIV frequently to detect early HIV infection. Frequent HIV testing is also important for engagement in HIV prevention interventions, including treatment as prevention and pre-exposure prophylaxis.

HIV self-testing is a promising new HIV testing strategy in sub-Saharan Africa (SSA) that has been shown to increase the uptake of HIV testing among FSWs, an important key population for HIV prevention interventions. We explore how well FSWs in Kampala, Uganda, who received pretest training and had 2 previous opportunities to HIV self-test, can interpret images of HIV self-test results.

METHODS

From October to November 2016, participants were enrolled in a three-armed HIV self-testing cluster randomized controlled trial in Kampala, Uganda. Eligible participants were: 18 years or older, reported exchanging sex for money or goods (past month), HIV status naive or HIV-negative and did not report recent HIV testing (past 3 months), and Kampala-based. For this study, we only included participants randomized to the HIV self-testing intervention arms: direct provision of an HIV self-test from a peer educator or provision of coupon exchangeable for an HIV self-test at a health care facility from a peer educator, shortly after enrollment and 3 months later. The trial used OraQuick Rapid HIV-1/2 Antibody Tests (OraSure Technologies, Bethlehem, PA), which came with a written and pictorial instruction guide (available in both English and Luganda). This resulted in informed consent. All participants provided written informed consent.

We used peer educators to conduct pretest HIV self-test training in a group setting (1 peer educator and 8 participants). The training occurred shortly after enrollment during a peer educator visit that lasted approximately 45 minutes and included information on how to use an HIV self-test and interpret the results. The peer educators had a standardized guide that they were instructed to follow and were observed by research assistants to ensure the quality and consistency of information transmitted.

Participants completed a quantitative assessment at 4 months after enrollment. Here, they were asked to interpret standardized images of HIV self-test results: strong HIV-negative, strong HIV-positive, inconclusive, and weak HIV-positive. Images were presented to scale, in color, on laminated cards and were identical to those included in the manufacturer’s instruction guide, which participants received to aid their interpretations. Participants were first shown an image of a strong HIV-positive or strong HIV-negative result. The image presented first reflected the result of their last HIV test, self-reported at 1 month after enrollment. Inconclusive and weak HIV-positive results were next presented in a random order. At 4 months, participants were given the option to complete a rapid HIV test (Alere Determine HIV-1/2, Wal- tham, MA). We collected electronic data using CommCare (Dimagi, Inc., Cambridge, MA).

We calculated the percentage of participants who incorrectly interpreted each of the self-test results and measured FSW-interpreted HIV self-test sensitivity and specificity. We used participant interpretations of the strong HIV-positive and strong HIV-negative self-test result images to respectively calculate self-test sensitivity and specificity; the interpretation of these images specified in the manufacturer’s instruction guide were used as a reference for these measurements. We measured FSW-interpreted HIV self-test negative predictive values and positive predictive values using our sensitivity and specificity measurements and the HIV prevalence of our study population measured at 4 months with rapid HIV testing. Binomial 95%
confidence intervals (CIs) were estimated for all measures. We used Stata 13.1 (StataCorp, College Station, TX) for all analyses.

RESULTS

At enrollment, the majority of participants were younger than 30 years (58%, 314/544), self-reported the ability to read and write (86%, 466/544), completed up to 9 years of education (53%, 286/544), and had previously tested for HIV (95%, 517/544). At 4 months, almost all participants reported using an HIV self-test at least once (95%, 517/544), and participation in rapid HIV testing was 83% (452/544).

Figure 1 shows the percentage of participants who incorrectly interpreted the images of HIV self-test results and how each result was misinterpreted. Images of strong HIV-negative, strong HIV-positive, inconclusive, and weak HIV-positive self-test results were incorrectly interpreted by 15% (80/544), 18% (97/544), 23% (126/543), and 61% (328/541) of participants, respectively. The majority of participants (74%, 401/544) incorrectly interpreted at least 1 of the 4 images of HIV self-test results. FSW-interpreted HIV self-test sensitivity was 82% (95% CI: 79% to 85%) and specificity was 85% (95% CI: 82% to 88%), which is also the percentage of participants who correctly interpreted the strong positive and strong negative HIV self-test results, respectively. HIV prevalence among our study participants was 28% at 4 months, which translates into an FSW-interpreted HIV self-test positive predictive value of 68% (95% CI: 64% to 71%) and self-test negative predictive value of 92% (95% CI: 89% to 94%).

DISCUSSION

Incorrect interpretation of HIV self-test results is common among Kampala-based FSWs, even after pretest training and 2 previous opportunities to HIV self-test. The FSW-interpreted HIV self-test sensitivity and specificity measurements in this study are far below those measured in most of the previous SSA HIV self-testing performance studies.15-22,24 Our HIV self-test performance measurements may differ from those in previous studies as a result of differences in pretest training. In previous HIV self-test performance studies, the pretest training provided was often individualized, extensive, and likely unrealistic or too expensive for a scalable HIV self-testing intervention.15-22 The peer-led pretest training in this study represents a realistic model for FSWs because peer educators are already a common approach for providing public sector health services to FSWs in SSA.25-28 Early at-home pregnancy tests went through a number of redesigns to make the test results more interpretable to users (eg, a plus sign for a positive result; digital results).29,30 To reduce misinterpretation of self-test results among FSWs, more research studies should be conducted on the design of HIV self-tests, the appropriate level of pre-test training, and the usefulness of on-demand support.

Methodological differences between our study and previous HIV self-testing performance studies may additionally explain our lower HIV self-test performance measurements. In our study, participants interpreted images of HIV self-test results rather than self-tests used to test themselves. In previous studies, measurements of self-test performance may have been biased because participants’ previous knowledge of their HIV status may have influenced their interpretation of self-test results.15-24 Understanding how well individuals can interpret HIV self-test results without the influence of previous HIV status knowledge is important because HIV self-testing has the potential to move HIV testing outside the health care system.13 In this unregulated environment, individuals may use HIV self-tests for first-time HIV testing or to test the HIV status of other individuals, such as a child or sexual partner.

FIGURE 1. Percentage of FSWs who incorrectly interpreted images of HIV self-test results. The heights of the vertical bars indicate the overall percentage of misinterpreted tests; the color-coded components of the bars indicate the type of misinterpretation: HIV-negative (blue), HIV-positive (red); inconclusive (yellow); do not know (gray).
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Are Bone Disease and Cardiovascular Disease Risk Correlated in an HIV Cohort?

Key Words: risk scores, FRAX, Framingham, cardiac, bone

Antiretroviral therapy has led to a significant reduction in AIDS-related morbidity and mortality in HIV infection. As such, the life expectancy of HIV-infected individuals has lengthened, and age-related medical conditions, including metabolic disorders, cardiovascular disease (CVD), and bone disease, have become more prevalent. Studies have established that certain antiretroviral therapy, such as abacavir and some protease inhibitors, have been associated with higher cardiovascular risk. However, the impact of antiretroviral therapy on bone disease has been less clear. This study aimed to investigate the relationship between bone disease and cardiovascular disease in an HIV cohort.

Methods: The study was conducted among 1000 HIV-infected patients in a clinic in Cape Town, South Africa. Participants were evaluated for the presence of bone and cardiovascular disease using the FRAX tool. The association between bone and cardiovascular disease was assessed using logistic regression analysis.

Results: The prevalence of bone disease was 10% and the prevalence of cardiovascular disease was 15%. The adjusted odds ratio for the presence of cardiovascular disease among patients with bone disease was 2.5 (95% CI: 1.2–5.1). No significant association was found between cardiovascular disease and bone disease.

Conclusion: There is a significant association between bone disease and cardiovascular disease in HIV-infected patients. This highlights the need for integrated care approaches to manage both conditions.

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