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Elevated HIV and STI Prevalence and Incidence among Methamphetamine-using Men who Have Sex with Men in Los Angeles County

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Abstract

Methamphetamine use is associated with increased HIV/STI infection among MSM. From March 2014 through January 2016, 286 methamphetamine-using MSM enrolled in a study to reduce methamphetamine use and sexual risk behaviors. Participants were tested for HIV/STIs at baseline and every three months for nine months. At baseline, 115 participants (40.2%) were HIV-positive; three participants seroconverted (incidence=2.6/100 person years). Baseline testing diagnosed 77 STI cases (21 Chlamydia, 18 gonorrhea, 38 syphilis); by 9-month follow-up, 71 incident STIs were diagnosed (22 Chlamydia, 24 gonorrhea, 25 syphilis); 78% occurred among HIV-positive participants. Conclusion: Despite efforts to reduce sexual risks among methamphetamine-using MSM, HIV/STI prevalence and incidence remain elevated.

Keywords

men who have sex with men; HIV; STI; methamphetamine; sexual risk

Introduction

Rates of HIV/STI prevalence among MSM in the U.S. remain elevated relative to their non-MSM male counterparts despite ongoing national efforts focused on reducing disease burden in the population (Centers for Disease Control and Prevention [CDC], 2016a; CDC, 2016b; Office of National AIDS Policy [ONAP], 2015). Evidence from epidemiological surveys of urban areas and large-sample research studies in the U.S. have repeatedly demonstrated significant associations between methamphetamine use and infection with HIV/STIs among MSM (Finlayson et al., 2011; Freeman, Walker, Harris, Garofalo, Willard, & Ellen, 2011; Hoenigl, Chaillon, Moore, Morris, Smith, & Little, 2016; Mayer et al., 2010; Rajasingham, Mimiaga, White, Pinkston, Baden, & Mitty, 2012; Shoptaw & Reback, 2006; Taylor, Aynalem, Smith, Montoya, & Kerndt, 2007). Epidemiological evidence also demonstrates significant associations between STI and HIV incidence as, among MSM, infection with

Chlamydia, gonorrhea, and/or syphilis significantly increases the likelihood of infection with HIV (Katz, Dombrowski, Bell, Kerani, & Golden, 2016; Rieg, Lewis, Miller, Witt, Guerrero, & Daar, 2008).

This reports the results of a study that assessed both HIV and STI prevalence and incidence among methamphetamine-using MSM enrolled in a randomized controlled trial to reduce methamphetamine use and HIV sexual risk behaviors in Los Angeles County, California. This report further details the rates of HIV/STI prevalence, newly diagnosed HIV/STI infections, and false HIV self-diagnosis (i.e., individuals assuming they were HIV positive due to past risk behaviors, without having seroconverted).

Methods

Participants

Participants were MSM, between the ages of 18 and 65 years, who self-reported any methamphetamine use in the previous three months, reported condomless anal intercourse (insertive or receptive) with a non-primary male partner in the previous 6 months, and were not seeking or currently in treatment for their methamphetamine use.

Procedures

Participants (N=286) were enrolled from March 2014 through January 2016. Recruitment strategies were identified to reach a diversity of methamphetamine-using MSM and included street- and venue-based outreach, print advertisement, online social media site advertisement and geolocation-based dating apps, flyers and posters distribution, and participant referral. Participants received a baseline assessment and HIV/STI testing; repeat HIV/STI testing occurred at 3-, 6-, and 9-months post-enrollment. All study procedures were approved by Friends Research Institute and the University of California, Los Angeles Institutional Review Boards.

Assessments

Behavioral Risk Assessment-Lite (BRA-Lite).—The BRA-Lite is a reduced version of the Behavioral Risk Assessment developed by the first author; it assessed participant sociodemographic characteristics.

HIV Testing.—Participants were asked to self-report their HIV status via an ACASI, thus reducing the likelihood of false reporting. Following the baseline ACASI all HIV-negative and status-unknown participants (including any participant unable to provide documentation of their HIV-positive status) received a rapid HIV-antibody finger stick blood test (OraQuick). If the test was reactive, the participant was retested with a second rapid finger stick blood test (Clearview Complete). If that test was reactive, the participant was presumed to be positive for HIV antibodies and referred for additional evaluation and treatment. If the second test produced a negative result, then the opposing results of the first test and second test were said to be discordant and the participant was referred for additional evaluation and treatment. Participants who showed documentation of their HIV-positive serostatus (e.g., ART medication, laboratory results) were not given a HIV-antibody test.

STI Testing.—Participants were tested for urinary *N. gonorrhea* and *Chlamydia*; pharyngeal and rectal swabs were taken for *N. gonorrhea* and *Chlamydia* (Aptima). Syphilis was tested by serum RPR, and confirmed by FTA-ABS testing. Positive STI results were reported per state guidelines and participants were immediately referred to care.

Statistical Analyses

Descriptive statistics (e.g., counts and percentages) and their accompanying Chi-square and Fisher's Exact tests were carried out using Stata v13SE; all significance tests were two-tailed and results were flagged as significant beginning at $\alpha = 0.05$.

Results

HIV Prevalence at Baseline

As shown in Table 1, participants were nearly 70% African American/Black or Hispanic/Latino, approximately two-thirds identified as gay, and educational attainment was evenly divided between those who had completed high school/GED or less and those who had some college or completed college.

At baseline, just over half of participants (162/286; 57%) reported a HIV-negative serostatus and had this status confirmed via biomarker testing; one participant who believed he was HIV-negative was identified as HIV-positive at baseline. A significant minority (117/286; 41%) reported a HIV-positive serostatus at baseline, though two of these individuals (2%) were tested and revealed to be HIV-negative. Five participants (2%) reported not knowing their HIV status, and two of those individuals tested HIV-positive. One individual refused to disclose his HIV status at baseline; he was tested, per baseline procedures, and confirmed to be HIV-positive.

HIV Incidence

As shown in Table 2, three of the participants who were HIV-negative at baseline subsequently seroconverted (2%); one participant's seroconversion was discovered at the 3-month follow-up evaluation, one at the 6-month follow-up evaluation, and one at the 9-month follow-up evaluation. The 167 participants who were HIV-negative at baseline were observed for a total of 115.7 person-years and demonstrated three seroconversions, resulting in a HIV incidence rate of 2.6 per 100 person-years.

STI Prevalence at Baseline and Incidence

Table 3 provides STI prevalence and incidence, arrayed by both biomarker-confirmed HIV status and study time point. At baseline, there were 21 cases of prevalent *Chlamydia* (oral, genital, or rectal), 18 cases of *gonorrhea* (oral, genital, or rectal), and 38 cases of syphilis. By nine months post-randomization, an additional 22 cases of *Chlamydia*, 24 cases of *gonorrhea*, and 25 cases of incident syphilis had been discovered through follow-up STI testing; the majority of incident STI infections (78%) occurred with HIV-positive participants.

Discussion

This sample of 286 sexually active, methamphetamine-using MSM not only demonstrated an elevated HIV prevalence rate of 42% at baseline, but also evidenced three HIV seroconversions (2.6 seroconversions per 100 person-years), uncovered two false HIV self-diagnoses, diagnosed three participants HIV-positive at baseline, and discovered 71 incident STIs. These findings are concerning insofar as they demonstrate a disconnect between coordinated nationwide efforts to reduce drug- and sexual-risk behaviors, and increase HIV/STI testing among methamphetamine-using MSM. Furthermore, such findings are critical for a more accurate understanding of the magnitude of the HIV and STI epidemics among methamphetamine-using MSM.

The estimated HIV prevalence among MSM in the U.S. is 15% (CDC, 2016b), less than half of the HIV prevalence observed among this sample. However, comparable rates of HIV have been observed among samples of methamphetamine-using MSM (Shoptaw & Reback, 2006; Vu, Maher, & Zablotska, 2015). A statewide epidemiological survey of MSM in Washington state revealed a HIV incidence rate of 0.4 per 100 person-years among MSM in general, with elevated rates observed among those recently diagnosed with a STI (Katz et al., 2016). The HIV incidence rate in this sample of methamphetamine-using MSM is nearly seven times that of non-methamphetamine-using samples of MSM, instead mirroring rates among populations of MSM recently diagnosed with early stage syphilis (Katz et al., 2016). The high HIV/STI prevalence and incidence rates observed in this sample corroborate known temporal associations between methamphetamine use and sexual risk behaviors among MSM (Halkitis, Levy, & Solomon, 2016).

Though the high rates of prevalent STIs at baseline serve as a marker of HIV sexual risk behaviors in the sample as a whole, the fact that the majority of incident STIs after enrollment occurred with HIV-positive participants indicates some mitigation of sexual risk-taking among the HIV-negative MSM participants. The lack of condom use among HIV-positive MSM also indicates that additional education is needed to inform HIV-positive MSM about the risks of STIs and HIV superinfection (Redd, Quinn, & Tobian 2013). Though treatment resistant superinfection is not common, neurocognitive deficits may be more likely among those infected with multiple strains of HIV (Wagner et al., 2016). These findings strongly indicate that among MSM, there is a continued need to simultaneously intervene with both methamphetamine use and sexual risk behaviors to reduce rates of HIV/STI transmission.

One of the two participants who falsely self-diagnosed a HIV-positive serostatus disclosed that he had been living in a long-term relationship with a HIV-positive partner and, therefore, assumed he had seroconverted at some point in the past (recorded in participant notes). Individuals who falsely believe that they are infected with HIV undoubtedly take fewer precautions to protect themselves during sexual encounters and, thereby, inadvertently expose themselves to HIV and other STIs. Although there have been resources dedicated to increase HIV testing among MSM, these do not address self-misdiagnoses. The non-trivial rate of self-misdiagnoses suggests the need to guide social media and marketing campaigns to include this issue in their messaging content. Of the five participants who reported not

having a recent HIV test at baseline and, therefore, self-reported their status as unknown, 2 (40%) were confirmed to be HIV positive at baseline. Increased testing efforts could provide an opportunity to diagnose new infections among MSM who may not be actively monitoring their serostatus through repeat testing. The CDC recommends retesting every three months for those engaged in high-risk activities; in this sample, ongoing routine testing for a mere nine months per participant uncovered three HIV seroconversions and 71 incident STIs.

The findings were limited by the non-random nature of the sampling frame (i.e., voluntary enrollment in a study to reduce methamphetamine use and sexual risk behaviors and, thus, introducing potential self-selection biases); results may not be generalizable to MSM not using methamphetamine or engaging in sexual risk behaviors. This study was conducted in an urban West Coast city; these findings could differ even among methamphetamine-using MSM from other geographical areas or from rural locations. Absolute rates of incidence were too small to allow for sufficiently powered inferential analyses, limiting the predictive ability of the results reported.

Conclusions

Recruitment efforts were explicitly designed to attract participants from a broad range of physical and digital sites to enroll a diverse sample. Nevertheless, the sample evidenced a HIV prevalence rate over twice the national average among MSM and a HIV incidence rate a full point higher than recent samples of high-risk MSM in the U.S. (Katz et al., 2016), and over 70 incident STIs. The implications of these findings indicate an ongoing need for increased HIV/STI prevention among MSM, particularly methamphetamine-using MSM, including continued efforts to screen methamphetamine-using MSM for HIV/STIs. The high observed rates of comorbidity between HIV and syphilis were particularly concerning, and indicate an area of further investigation for researchers and service providers working with this and similar populations. Furthermore, policy makers and funders should consider social media and marketing campaigns targeted to warn against self-diagnosis and encouraging HIV and STI testing every three months, per CDC guidelines. The high prevalence rates observed at baseline and high incident rates strongly suggest that the deleterious associations between methamphetamine use and sexual risk among MSM has not adequately diminished in the previous 20 years.

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Table 1:

Participant Sociodemographic Characteristics (N = 286)

	n (%) or Md [Range]
Sexual Identity	
Gay Identified	192 (67.1%)
Not Gay Identified	94 (32.9%)
Racial Identity	
African American/Black	125 (43.7%)
Hispanic/Latino	72 (25.2%)
Caucasian/White	56 (19.6%)
Other/Multi	33 (11.5%)
Educational Attainment ^a	
Less than HS Graduate/GED	50 (17.7%)
HS Graduate/GED	86 (30.5%)
Some College/College Graduate	146 (51.8%)
Age (years)	42 [18–65]

^aEducational Attainment n = 282

Table 2:

Participant HIV Status at Baseline; ACASI Self-Reported Versus Biomarker Confirmed Tests (N = 286)

		Biomarker Confirmed		
		HIV Negative	HIV Positive	Total
Self-Reported	HIV Negative	162	1	163 (57.0%)
	HIV Positive	2	115	117 (40.9%)
	HIV Status Unknown	3	2	5 (1.8%)
	Refused	0	1	1 (0.4%)
	Total	167 (58.4%)	119 (41.6%)	286 (100%)

Table 3:

Prevalence and Incidence of Sexually Transmitted Infections, by HIV Status and Study Time Point

	HIV-Negative					
	Chlamydia^a		Gonorrhea^a		Syphilis	
	Prevalence	Incidence	Prevalence	Incidence	Prevalence	Incidence
Baseline (n _{HIV-} = 167)	13 (7.8%)	-	8 (4.8%)	-	7 (4.2%)	-
3-Month Assessment (n _{HIV-} = 146)	2 (1.4%)	0 (0.0%)	2 (1.4%)	4 (2.7%)	6 (4.1%)	2 (1.4%)
6-Month Assessment (n _{HIV-} = 143)	1 (0.7%)	1 (0.7%)	0 (0.0%)	3 (2.1%)	7 (4.9%)	1 (0.7%)
9-Month Assessment (n _{HIV-} = 150)	4 (2.7%)	2 (1.3%)	0 (0.0%)	2 (1.3%)	7 (4.7%)	0 (0.0%)
	HIV-Positive					
Baseline (n _{HIV+} = 119)	8 (6.7%)	-	10 (8.4%)	-	31 (26.1%)	-
3-Month Assessment (n _{HIV+} = 105)	1 (1.0%)	4 (3.8%)	2 (1.9%)	4 (3.8%)	22 (21.0%)	8 (7.6%)
6-Month Assessment (n _{HIV+} = 97)	1 (1.0%)	8 (8.2%)	1 (1.0%)	5 (5.2%)	25 (25.8%)	2 (2.1%)
9-Month Assessment (n _{HIV+} = 105)	3 (2.9%)	7 (6.7%)	4 (3.8%)	6 (5.7%)	23 (21.9%)	12 (11.4%)
Total	21	22	18	24	38	25
Total Cases	43		42		63	

^aRectal, Oral, or Genital