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Methamphetamine use and sexual risk behaviours among men who have sex with men diagnosed with early syphilis in Los Angeles County

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Summary:

Methamphetamine use has been associated with risky sexual behaviour and sexually transmitted disease (STD)/HIV transmission among men who have sex with men (MSM). Field interview records for MSM early syphilis (ES) patients were reviewed for factors associated with methamphetamine use during January 2001 through December 2004. There were a total of 2915 ES cases reported during the study period. Of these, 1904 (65%) were MSM. Of these MSM, 167 reported methamphetamine use. Methamphetamine use was associated with having multiple sex partners (prevalence ratios [PR] 1.8, 95% confidence interval [CI] 1.4–2.4), not using condoms (PR 2.0, 95% CI 1.3–2.5), having anonymous sex partners (PR 1.1 95% CI 1.03–1.2), history of recent incarceration (PR 5.4, 95% CI 3.3–8.7), and meeting sex partners via the Internet (PR 1.6, 95% CI 1.3–2.1), at bathhouses (PR 1.6, 95% CI 1.2–2.0) and on the streets (PR 2.6, 95% CI 1.7–4.0). In multivariate analysis having multiple sex partners, not using condoms, recent incarceration and meeting sex partners at bathhouses were significantly associated with methamphetamine use. In conclusion, effective STD risk reduction interventions targeting MSM methamphetamine users are needed to curb risky sexual behaviour.

Keywords

methamphetamines; HIV; sexual behaviour; MSM; syphilis

INTRODUCTION

The use of non-injection drugs such as methamphetamines, poppers/nitrates, ecstasy, and sildenafil have been associated with unprotected anal sex with persons of unknown HIV status among men who have sex with men (MSM),¹⁻³ HIV medication non-adherence^{4,5} and diagnosis of sexually transmitted diseases (STDs) among MSM.^{6,7} Correlations between methamphetamine, sildenafil and amyl nitrate use, and the highest risk exposure for HIV

transmission, namely unprotected anal intercourse with partners of unknown or negative HIV serostatus, have been reported.^{7,8} Additional reports demonstrate specific associations with methamphetamine use, and unprotected anal receptive sex and sildenafil use with unprotected insertive anal sex.⁹ Rising rates of syphilis¹⁰⁻¹² and HIV¹³ among MSM in larger urban centres across the USA has prompted ongoing concern regarding increases in sexual-risk-taking behaviours among MSM including recreational drug use.

Methamphetamines have become one of the most commonly used recreational drugs among MSM in the West Coast region.² Studies of MSM recently infected with HIV report significant associations of unsafe sexual activity with methamphetamine use prior to the time of HIV diagnosis.⁸ A tight linkage was reported between methamphetamine use and sexual activity by MSM in Los Angeles. Enhancement, amplification and increased intensity of the sexual experience, as well as the ability to prolong sexual performance and orgasm, have been reported as pleasurable effects of methamphetamines by users in this study. Methamphetamine users reported variable use of condoms, and HIV-negative methamphetamine users were less likely to report use of condoms in this qualitative study than were HIV-positive men.¹⁴ HIV-positive methamphetamine users in this cohort were more likely to report having more sexual partners with whom they participated in unprotected receptive anal sex than were non-users.¹⁵

We evaluated the use of methamphetamines among MSM diagnosed with early syphilis (ES) during 2001–2004 in Los Angeles to describe demographic and behavioural correlates, as well as associations with venues reported for meeting sex partners, in effort to better characterize the ongoing disease risk associated with these behaviours. We reviewed associations of methamphetamine use as compared with no methamphetamine use to determine specific behavioural associations and venue choice for meeting sex partners among MSM with ES that reported use of this drug.

METHODS

Syphilis is a reportable infectious disease in California. Medical providers as well as laboratories are required to report cases of syphilis within 24 hours of diagnosis or receipt of positive lab result. Public health investigators (PHIs) conduct field interviews of ES cases (primary, secondary and early latent) to collect additional demographic information, risk behaviour information, and information on contacts and partners. PHIs provide counselling and treatment referral to infected patients and proceed with partner notification to decrease onward transmission to future sexual partners. A retrospective review of these cases collected during 2001–04 was performed to identify correlates of drug use during the period when syphilis infection likely occurred.

Data collection

Field interview records obtained on MSM ES cases were reviewed for the years 2001–04 for demographic, behavioural and clinical data. Demographic data included age, race/ethnicity, zip code of primary residence, HIV status and history of incarceration. Behavioural risk data included self-reported anal sex, oral sex, anonymous sex, number of sexual partners, venues for meeting sex partners, condom use, and intravenous and non-intravenous drug use. Sex

with anonymous partners was defined as oral or anal sex with a person for whom no identifying information was available to the syphilis patient. Multiple partners was defined as having more than one partner during the period when syphilis infection likely occurred. Clinical data included stage of diagnosis, symptoms present at the time of diagnosis, treatment information and follow-up lab testing. Data collection, evaluation and analysis are part of ongoing public health surveillance activities and thus are not subject to review by institutional review boards.

Case definition

ES consisted of all reported primary, secondary and early latent syphilis cases. The diagnosis of *primary syphilis* was made by the presence of one or more painless ulcers at the site of exposure and the demonstration of exposure to *Treponema pallidum* by a reactive serologic test for syphilis; *secondary syphilis* was diagnosed by the presence of characteristic dermatologic lesions and reactive treponemal test (fluorescent treponemal antibody absorption [FTA-ABS] or *T. pallidum* particle agglutination assay [TP-PA]), or reactive non-treponemal test (titre >1:4) and *early latent syphilis* was diagnosed in those with no clinical signs or symptoms of syphilis and the presence of one of the following: a four-fold or greater increase in titre of a non-treponemal test during the previous 12 months or a history of symptoms consistent with primary or secondary syphilis during the previous 12 months or a history of sexual exposure to a partner who had confirmed infectious syphilis or from a person whose only possible exposure occurred within the preceding 12 months.¹⁶

‘Critical period’ is defined as the time period when a patient is most likely to have contracted syphilis through to the date of treatment. This period includes the time during which a patient is potentially infectious to others and varies by the stage of syphilis infection. For primary syphilis, it is the period from treatment date back to 90 days prior to the onset of symptoms. For secondary syphilis, it is the period from treatment date back to six and a half months prior to the onset of symptoms. For early latent syphilis, it is the period from the date of treatment back by one year.¹⁷

Analysis

Data were analysed using SAS statistical package version 8.0 (SAS Institute, Cary, NC, USA). Initial descriptive analyses of all variables were used to create dichotomized potential predictor variables. Factors that influenced the outcome of interest were assessed in bivariate analysis using χ^2 statistics for categorical variables. Prevalence ratios (PR) were used to compare demographic and risk behaviours between methamphetamine users and non-users. Using logistic regression analysis, the odds of using methamphetamines during the period when syphilis infection likely occurred were calculated, and variables that were independent predictors of methamphetamine use were determined by including all independent variables in the model.

RESULTS

Description of study population

A total of 2915 cases of early syphilis were reported to the Los Angeles County Department of Health during January 2001–December 2004. Of these, 1904 cases (65%) occurred among MSM. The study population consisted of those MSM diagnosed with ES during 2001–04 in Los Angeles County that responded to questions regarding drug use during the field interview. Of these, 1116 (59%) had primary or secondary syphilis, and 788 (41%) had early latent syphilis. In the sample population, 896 (47%) were White, 200 (11%) were Black and 685 (36%) were Hispanic. The age distribution was as follows: 26 (1.4%) were less than 20 years of age, 375 (20%) were between 20 and 29 years of age, 850 (45%) were between 30–39 years of age and 516 (27%) were between 40 and 49 years. Fifty-nine percent ($n = 1113$) of the sample population self-reported being HIV positive.

Of the population of ES cases that were MSM, 358 (19%) reported drug use. Among the ES MSM cases reporting drug use, methamphetamine use was reported by 167 (47%), marijuana 156 (45%), cocaine 53 (15%), sildenafil 23 (7%), ecstasy 20 (6%), poppers/nitrates, 16 (5%) and GHB (gamma hydroxybutyric acid) six (2%). There were no MSM with early syphilis that reported use of heroin or ketamine in this sample.

Trends in use of methamphetamine by men who have sex with men with early syphilis

Methamphetamine was the most commonly reported drug among MSM ES cases. However, the number of MSM reporting methamphetamine use was similar during the years 2001–04. The number of MSM ES cases reporting the use of methamphetamines during in 2001 was 15, as compared with 47 in 2002, and 61 in 2003 and 44 in 2004. Of these methamphetamine users with ES, 64% reported being HIV positive in 2001, 73% in 2002 65% in 2003 and 68% in 2004.

Demographic and behavioural correlates of methamphetamine users

Overall, 9% ($n = 167$) of MSM who were diagnosed with ES infection during 2001–04 reported using methamphetamines. Of these, 48% were aged 30–39 years, 68% reported being HIV positive, 63% reported having sex with one or more anonymous partners and 81% reported not using condoms. In bivariate analysis, prevalence of methamphetamine use was lower among Blacks (Blacks versus Whites, PR 0.5, 95% CI 0.3–0.9). Having multiple partners (PR 1.7, 95% CI 1.3–2.3), condom non-use (PR 1.3, 95% CI 1.2–1.4), having anonymous sex partners (PR 1.1 95% CI 1.03–1.2), history of recent incarceration (PR 5.2, 95% CI 3.2–8.2), and meeting sex partners via the Internet (PR 1.6, 95% CI 1.2–2.0), at bathhouses (PR 1.6, 95% CI 1.3–2.0) and on the streets (PR 2.6, 95% CI 1.7–4.0), were significantly associated with methamphetamine use as compared with no methamphetamine use among MSM diagnosed with ES during 2001–04 (Table 1).

Controlling for race, sexual risk behaviours, previous incarceration and venue use in multivariate analysis, having multiple partners (OR 2.2, 95% CI 1.2–4.3), condom non-use (OR 3.2, 95% CI 1.4–7.2), recent incarceration (OR 10.5, 95% CI 3.6–30.4), and meeting

sex partners at bathhouses (OR 2.6, 95% CI 1.3–5.2) remained significant in multivariate analysis.

DISCUSSION

Our findings describe the use of recreational drugs, specifically methamphetamines among MSM with ES in Los Angeles. MSM with ES reporting methamphetamine use were less likely to report condom use and were more likely to report having multiple sex partners than non-methamphetamine-using MSM. These results support previous findings of unsafe sexual behaviour occurring among MSM who use methamphetamines.^{8-10,14-15,18} The use of other sexually stimulating drugs such as ecstasy and sildenafil as part of the sexual experience may promote sex with more partners in addition to unsafe sex.³ The possibility of further increases in HIV and STDs among MSM using these drugs is likely, given the evidence linking use to unsafe sexual behaviour.

Methamphetamine use has been associated with HIV, as well as other STD transmission.^{6,8} Among this group of MSM with early syphilis that reported methamphetamine use, many were HIV infected. The use of methamphetamines by MSM with ES who are also infected with HIV is of significant public health concern. Incorporating effective drug use and drug treatment intervention efforts into HIV/STD primary prevention programmes for MSM have been considered as part of a multidisciplinary approach to disease prevention in this risk group.¹⁹ The provision of longstanding effective drug-use interventions poses a significant challenge in this population as methamphetamines are tightly linked to sexual activity for some MSM. An additional challenge is addressing the ‘community norm’ of methamphetamine use in association with sexual encounters among some populations of MSM engaging in unsafe sexual practices.¹⁴

Methamphetamine users were more likely to report meeting sex partners in bathhouses and sex clubs. Use of commercial sex venues such as bathhouses and sex clubs to meet sexual partners has been associated with drug use, unprotected anal intercourse and STD transmission.²⁰⁻²¹ These commercial sex environments provide opportunities for sex with multiple partners that are frequently anonymous. MSM in Los Angeles diagnosed with ES who reported meeting sex partners at bathhouses during the time in which they most likely became infected with syphilis were more likely to be HIV infected, to report sexual encounters with anonymous partners, to report condom non-use, and to report use of intravenous and non-intravenous drugs.²² When combined with drug use and unsafe sexual behaviours, such as sex with anonymous partners and sex without condoms, these venues provide substantial opportunities for the transmission of STDs including HIV.

Recent incarceration was associated with methamphetamine use in our sample. Methamphetamine use has been associated with risky sexual behaviour in a study of Los Angeles County arrestees.²³ Periods of incarceration may represent timely opportunities for STD/HIV testing, and drug and safer-sex counselling.²⁴ Further evaluation of the delivery of HIV/STD prevention efforts to high-risk incarcerated MSM and those recently released is needed.

Our study has the following strengths and limitations. We were able to compare demographic and behavioural information from methamphetamine using and non-using MSM diagnosed with ES, thereby avoiding any differential of STD risk. Our data were collected by face-to-face interviews by public health investigators near the time of syphilis diagnosis, reducing the likelihood of recall bias. Fewer MSM in our study reported methamphetamine use as compared with previous studies.^{2,6} Substantial underreporting of drug use and other behaviours likely occurred due to the sensitive nature of the question material administered in the public health context. We were not able to analyse risk behaviours associated with other types of drug use due to sample size. Sample size also limited our power to detect potentially important differences for some behavioural factors. Our findings cannot be generalized to other MSM populations as all of these men had been recently diagnosed with syphilis and did not represent the MSM population as a whole.

Public health attention to methamphetamine use and other drug use is needed as part of the ongoing effort to prevent sexual risk behaviours that increase the probability of STD and HIV transmission in MSM. Integrated public health efforts that include drug use treatment and counselling in HIV/STD education and prevention programmes are needed to effectively address unsafe sexual behaviour among these drug-using populations of MSM. Further study is needed regarding interventions among drug-using MSM populations to determine effective ways to decrease sexual risk behaviours.

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Demographic and behavioural characteristics of MSM early syphilis cases reporting methamphetamine (Meth) use ($n=167$) versus MSM early syphilis cases reporting no methamphetamine use, 2001–04

Table 1

Variable	Meth use ($n=167$) [*] No. (%)	Prevalence No. (%)	Prevalence ratio PR (95% CI)	P value
Age (years)				
<20	3 (2)	26 (12)	1.0 (0.3–3.2)	1.0
20–29 [†]	43 (26)	375 (11)	1.0 (Ref)	NA
30–39	80 (48)	850 (10)	0.9 (0.8–1.1)	0.3
40–49	35 (21)	516 (7)	0.8 (0.6–1.0)	0.01
50+	6 (4)	137 (4)	0.4 (0.2–0.9)	0.02
Race/ethnicity[‡]				
White [†]	86 (52)	862 (10)	1.0 (Ref)	NA
Black	9 (5)	200 (5)	0.5 (0.3–0.9)	0.02
Hispanic	62 (37)	685 (9)	1.0 (0.8–1.2)	0.7
Other/Mixed	10 (6)	122 (8)	0.9 (0.5–1.6)	0.6
Syphilis stage				
Primary/secondary	95 (57)	1,116 (9)	1.0 (0.8–1.1)	0.6
Early latent [†]	72 (43)	788 (9)	1.0 (Ref)	NA
HIV seropositive[§]	106 (64)	1,113 (10)	1.0 (0.9–1.1)	1.0
Behavioural risk factors^{**}				
Multiple sex partners	40 (42)	179 (22)	1.7 (1.3–2.3)	0.003
Anal insertive sex	134 (84)	1,252 (11)	1.0 (1.0–1.1)	0.6
Anal receptive sex	139 (86)	1,213 (12)	1.1 (1.0–1.1)	0.07
Oral sex	156 (98)	1,571 (11)	1.0 (1.0–1.1)	0.2
Anonymous partner ^{††}	138 (86)	1,195 (12)	1.1 (1.03–1.2)	0.01
Condom non-use	124 (81)	877 (14)	1.3 (1.2–1.4)	< 0.001
Incarceration ^{‡‡}	25 (17)	66 (38)	5.2 (3.2–8.2)	< 0.001
Venues for meeting sex partners^{\$\$\$}				

Variable	Meth use (n=167) No. (%)	Prevalence No. (%)	Prevalence ratio PR (95% CI)	P value
Bathhouses/sex clubs	59 (35)	350 (17)	1.6 (1.3–2.0)	< 0.001
Bars and clubs	59 (38)	638 (9)	0.8 (0.7–1.0)	0.05
Internet	55 (38)	338 (55)	1.6 (1.2–2.0)	0.004
Motels	6 (4)	33 (18)	1.8 (0.8–4.3)	0.2
Streets	23 (16)	95 (24)	2.6 (1.7–4.0)	< 0.001
Parks	6 (4)	72 (8)	0.7 (0.3–1.7)	0.5
Dancehalls	1 (0.7)	12 (8)	0.7 (0.1–5.7)	0.8

* Totals and percentages by variable may vary because of missing values for behavioural risk factors and venues for meeting sex partners

[†] Reference group

[‡] White versus non-White used for odds ratio calculation

[§] HIV status provided by self-report during field interview and is not lab confirmed

^{**} Defined as greater than one sex partner during the interview period

^{††} Anonymous partner is defined as a sexual partner for whom the syphilis case was unable to provide any type of identifying or locating information

^{‡‡} Incarceration in the previous year

^{§§} Had sex or met sex partners at venue during the period when syphilis infection likely occurred (critical period)