Methamphetamine use and infectious disease-related behaviors in men who have sex with men: implications for interventions

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ABSTRACT

Aims Review the current evidence regarding the prevalence of methamphetamine use among men who have sex with men (MSM) and to evaluate the factors that contribute to methamphetamine use and potential for sexual transmission of HIV and other infectious diseases. **Methods** Databased reports address (1) epidemiology of methamphetamine use in MSM; (2) methamphetamine use and risk behaviors for sexually transmitted infections; and (3) interventions. **Findings** Methamphetamine use is highly prevalent in MSM. Strong associations between methamphetamine use and HIV-related sexual transmission behaviors are noted across studies of MSM and correspond to increased incidence for HIV and syphilis compared to MSM who do not use the drug. Behavioral treatments produce sustained reductions in methamphetamine use and concomitant sexual risk behaviors among methamphetamine-dependent MSM. **Conclusions** Brief screening of methamphetamine use for MSM who seek physical, mental health and substance abuse services is recommended. Behavioral interventions that address methamphetamine use may range from brief interventions to intensive out-patient treatments.

Keywords Gay men, HIV risk behavior, methamphetamine, prevalence.

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INTRODUCTION

The prevalence of life-time substance use among men who have sex with men (MSM) is substantially higher than that for heterosexual men or women [1,2]. ('MSM' is used as a narrow term that describes sexual behavior while 'gay or bisexual' reflects the adoption of a sexual identity and a culture shared by MSM that extends beyond sexual behaviors.) Methamphetamine use is prevalent among MSM living in the United States [1,3], Australia and western Europe [4]. There are expressions of concern that this drug in particular may lead to accelerating new HIV infections [5] and to potential for promoting transmission of multi-drug-resistant HIV [5,6]. Among MSM, methamphetamine is frequently used alone [7] and in combination with other club drugs [8,9] (i.e. methamphetamine, amphetamine, ecstasy, cocaine, GHB and ketamine). With its rise in popularity in communities of gay and bisexual men, evidence has accumulated to detail not only its epidemiology, but also to describe cultural factors that facilitate its use and to indicate important ways in which methamphetamine is combined with sexual transmission behaviors. Evidence is also accumulating on interventions that should be considered when articulating a comprehensive approach to address the high rates of methamphetamine use in MSM. This manuscript reviews the recent evidence on the epidemiology, linkages between methamphetamine use and HIV-related sexual transmission behaviors, and evidence-based interventions with methamphetamine-using MSM.

EPIDEMIOLOGY OF METHAMPHETAMINE USE

Around the world, 35 million people use amphetamine type stimulants [including methamphetamine and ecstasy (MDMA)], which eclipses use of all other illicit drugs excepting cannabis [10]. Reports using probability sampling in the United States indicate that up to 13% of

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adult MSM used methamphetamine in the previous 6 months [2]. Among MSM aged 15–22 years, 20.1% admitted using methamphetamine [11] over a similar period.

Important questions arise regarding factors that may explain the high prevalence of methamphetamine use in MSM. One of the first qualitative studies on methamphetamine use in MSM described three shared identities relative to the drug: gay identity (the importance of methamphetamine use to facilitate gay sexual experiences and to access gay culture), crystal user identity (the perception of one's own use of methamphetamine in comparison to that of other gay or bisexual methamphetamine users) and identity regarding HIV (the ways in which methamphetamine assuages thoughts about HIV-related issues for both infected and uninfected men) [12]. Qualitative reports are consistent in describing ways in which crystal methamphetamine is reported to facilitate uninhibited sexual behaviors, while ecstasy (MDMA) is reported to enhance feelings of euphoria and group connectedness [13]. Stimulant-using Latino gay men also report using methamphetamine for sexual reasons, while cocaine enhances social connections [14]. In contrast, heterosexual males and females seeking treatment of methamphetamine abuse indicate that methamphetamine is used to get high, to have fun, to get energy, to use with friends, to stay awake, to 'escape', to enhance sex, to lose weight and to work more [15]. As well as informing the process of tailoring interventions that aim to reduce methamphetamine use in MSM, cultural factors unique to gay and bisexual methamphetamine users highlight how feelings of stigma and negative personal attributions, internalized or otherwise, are experienced by this group of drug users [16].

METHAMPHETAMINE USE AND RISK BEHAVIORS FOR SEXUALLY TRANSMITTED INFECTIONS IN MSM

Physiological and psychological properties of methamphetamine make it efficient for facilitating behaviors that transmit HIV and other infectious diseases. The drug is inexpensive (approximately US$25–80 per gram) and has a long half-life (8–12 hours) that enables long sexual episodes. The drug induces euphoria, brightens mood, eliminates fatigue, decreases appetite (leading to weight loss), focuses attention and, for many, heightens libido [17]. MSM who use methamphetamine engage in high rates of HIV-related sexual risk behaviors [18]. In young MSM, substances are combined frequently with sex: 42.8% reported being under the influence of alcohol when having sex, 28.2% used marijuana, 9.2% used amphetamines, 8.7% used cocaine and 8.0% used amyl nitrite during sex in the previous 6 months [3].

MSM who use methamphetamine and who are HIV-infected also are likely to engage in sexual risk behaviors when under the influence, although not always with HIV-negative partners [19]. Among HIV-positive injectors, use of methamphetamine corresponds with significant healthcare disparities as marked by lower employment, lower annual income, less identification with the gay community, more likely to be diagnosed with AIDS and more likely to be sexually abused than non-injection drug users or non-drug-using MSM [20]. HIV-positive MSM who inject are also more likely to report experiences with stigma over being a methamphetamine user and educational status than non-injecting methamphetamine users [21].

While methamphetamine use appears to be associated with high-risk sexual behaviors in MSM, it is difficult to specify direct effects of the drug on HIV transmission. Methamphetamine dries the mucosa and reduces the sensitivity of the rectal and genital areas. This can facilitate longer and rougher sexual episodes and contribute to increased likelihood of bruising and tearing in the region and of increasing opportunities for transmission of infectious disease. Use of amyl nitrites and other drugs that can facilitate sexual functioning can also increase risks for disease transmission [22,23]. Chronic use of methamphetamine can cause some men to experience erectile dysfunction, although sildenafil, vardenafil or tadalafil are used to counter this effect. The combination of sildenafil (and perhaps related compounds of vardenafil and tadalafil) with amyl nitrite in the presence of recreational use of methamphetamine and other club drugs has been reported to cause death [24].

HIV/AIDS surveillance in the United States shows MSM to be the only behavioral risk group with increasing incidence [25]. Estimates of HIV incidence in MSM averages 1.55 per 100 people per year (95% CI = 1.23 – 1.95) [23], which corresponds to a prevalence of 19.1% in California (95% CI = 12.8% to 25.3%) [26]. Incidence rates are doubled [23] or tripled [27] for MSM who use amphetamines compared to non-drug-using MSM. These findings, although localized to the epidemic in the United States, indicate that methamphetamine has profound effects on sexual behaviors that increase risks for disease transmission in this already at-risk group.

Methamphetamine use is also associated with transmission of other infectious diseases in MSM. In one recent report of 1318 gay and bisexual men at a public health department clinic, 4.0% tested positive for early syphilis [28]. Factors that associated significantly with syphilis infection included being of non-white race, being HIV infected, using methamphetamine with sildenafil, using

methamphetamine alone, using sildenafil without methamphetamine, stronger gay community affiliation, and having recent internet sex partners. The increased likelihood of HIV-infection in MSM with early syphilis suggests serosorting when some HIV-infected men select sexual partners. Among these, use of methamphetamine and sildenafil increased their odds for becoming infected with syphilis. The robust nature of the linkages between methamphetamine use and risk behaviors that transmit infectious disease in MSM have led some to promote methamphetamine use reduction as part of comprehensive HIV prevention plans.

BEHAVIORAL INTERVENTIONS

One strategy to interventions involves providing prevention services to reduce sexual risk behaviors among methamphetamine-using MSM. Outcomes from this approach demonstrate that enhanced behavioral HIV prevention using multiple group sessions significantly reduces rates of serodiscordant unprotected anal intercourse over standard HIV prevention in the shorter term [29], with no differences between groups observed to long-term evaluations. Yet, participants in this trial who used methamphetamine were statistically more likely to engage in HIV-related risk behaviors and to seroconvert than non-drug users [30], indicating that prevention interventions designed to reduce sexual risk behaviors may have initial effects for MSM in general, with limited impact in methamphetamine using MSM.

BIOMEDICAL PREVENTION

Given the high rates of methamphetamine use among MSM and corresponding HIV-related risk behaviors, biomedical prevention approaches may be especially appropriate in helping HIV-negative men remain uninfected. Two methods of biomedical prevention are considered, including non-occupational post-exposure prophylaxis (nPEP) and more recently, pre-exposure prophylaxis (PrEP). N-PEP entails initiation of a short course of antiretroviral therapy following potential exposure to HIV from sexual or drug-related behaviors. Guidelines advise initiation of a two- or three-drug antiretroviral therapy immediately after an exposure event (within 36–72 hours) to reduce the probability of HIV seroconversion [31]. In a Brazilian report, 200 MSM received 4 days of antiretroviral medications to take home with instructions to begin the medication immediately following a potential exposure event followed by 24 days of additional medication. Over approximately 24 months, nPEP was started by 68 MSM following 109 risk events. A total of 11 seroconversions were reported; 10 among MSM who did not use nPEP and one among those who did, a non-statistically significant difference [32]. Reasons for not using nPEP included having sex with a steady partner and not considering the risk event sufficiently high risk to start nPEP, a key problem with nPEP [33]. In high-risk groups of MSM such as methamphetamine users, clinical benefits to biomedical HIV prevention using nPEP may be of sufficient level to balance side effects and costs from the approach. Moreover, nPEP provides an optimal point for screening for sexually transmitted infections additional to HIV for MSM who seek nPEP [34].

Pre-exposure prophylaxis contrasts with nPEP by providing antiretroviral therapy to high-risk individuals prior to a potential exposure event in order to help the immune system resist HIV infection. Although clinical trials will probably not demonstrate definitive efficacy of this approach, pre-exposure prophylaxis may represent a viable and potentially safe method for biomedical HIV prevention in the absence of an effective vaccine—particularly in groups with high incidence rates. This approach to biomedical prevention, however, requires substantial effort to document safety and efficacy prior to issuing guidelines recommending its use, even in high-risk groups.

BEHAVIORAL TREATMENTS

Behavioral interventions that address methamphetamine use and thereby reduce concomitant HIV-related sexual transmission behaviors in MSM represent an alternate approach. One low-intensity intervention, the 5 "A"s, can be implemented in most clinical settings, adapting the practice guideline for smoking cessation for use with methamphetamine-using MSM [35]. In communities with high prevalence of methamphetamine use in MSM, a first step is to screen for methamphetamine use (Ask) at points of physical, mental health, and substance abuse care using a structured progress note that assesses methamphetamine use. For those who admit to methamphetamine use, the clinician advises in a clear manner that the individual quit their use of this drug (Advise). Next the clinician inquires whether the client is willing to make a quit attempt (Assess) and assists him by evaluating the client's level of methamphetamine use, by linking the client to available community and professional resources and by recommending medical evaluation for the client, particularly if the individual is HIV infected (Assist). Clinicians arrange for future evaluation either by scheduling repeat visits or telephone calls to follow-up (Arrange).

Brief, low-intensity interventions may help some MSM who use methamphetamine at recreational levels to reduce or eliminate methamphetamine their drug use. A substantial group, however, may require intensive interventions that integrate behavioral drug abuse treatment with HIV sexual risk reductions. Currently, no medications are approved for treating methamphetamine

dependence. Yet behavioral therapies have shown efficacy in assisting individuals with methamphetamine abuse or dependence in discontinuing their drug use.

More intensive behavioral therapies are conducted from drug abuse treatment clinics and involve at least weekly visits. In the largest randomized trial, cognitive behavioral therapy (Matrix Model) was compared with treatment as usual (TAU) in eight sites and 978 participants [36]. Participants assigned to the Matrix Model, which uses group sessions to teach skills for instilling abstinence from methamphetamine, for avoiding relapse and for resuming abstinence should relapse occur, were 38% more likely to stay in treatment and were 31% more likely to provide a methamphetamine-metabolite-free urine sample during treatment than participants receiving TAU. Treatment greatly reduced drug use in both conditions from an average of 11 of the previous 30 days at baseline to slightly over 4 days at 6-month follow-up visits.

Evidence has also accumulated for the use of contingency management (CM; i.e. providing vouchers of increasing value for successive urine samples documenting stimulant abstinence) for treatment of methamphetamine dependence. In a trial of 171 predominantly heterosexual stimulant-dependent individuals assigned randomly to a CBT condition (Matrix Model), a CM condition or a CBT + CM condition, results comparing the metabolite-free urine samples produced per condition over a 12-week study period featuring thrice-weekly urine collection showed the CM condition (mean = 27.6) and the CBT + CM condition (mean = 28.6) to significantly out-perform the CBT condition (mean = 15.5). Reductions in self-reported drug use, however, were similar for all three conditions, with those at baseline averaging between 9 and 10 days of use for the previous 30 days and those at 1-year follow-up visits averaging between 2 and 5 days of use.

These efficacious drug abuse treatments for heterosexual methamphetamine abusers appear to work similarly with MSM. In one controlled trial [37], methamphetamine-dependent gay and bisexual men were assigned randomly to one of the following behavioral drug abuse treatment conditions for 16 weeks: (1) a CBT condition (the Matrix Model; $n = 40$), which served as a standard condition; (2) CM ($n = 42$); (3) combined CBT + CM ($n = 40$); and (4) an adapted gay-specific cognitive behavioral therapy (GCBT; $n = 40$) that translated the core elements of standard CBT to reflect referents of gay culture. Results showed CM-containing conditions to yield significantly longer periods of consecutive urine-verified methamphetamine abstinence compared to CBT during the treatment period (CBT = 2.1 weeks; CM = 5.1 weeks; CBT + CM = 7.0 weeks; GCBT = 3.5 weeks). As in the Rawson trial, however, ratings of self-reported methamphetamine use reduced similarly across conditions from 9 to 10 of the previous 30 days at baseline to 3–5 of the previous 30 days at 1-year follow-up visits. Along with drug use reductions, episodes of unprotected anal intercourse with other than primary partner in the past 30 days were reduced from an average of three episodes in the past 30 days at baseline to an average of less than one episode at 1-year follow-up visits. That both drug use and sexual risk behaviors were reduced substantially to distal evaluations provides strong suggestions for methods to reduce intertwining risk behaviors.

CONCLUSION

Methamphetamine use is prevalent among MSM in the United States, Australia and Britain. Use of methamphetamine may range from recreational to chronic to addiction; however, the data indicate consistently that MSM who use this drug engage in concomitant HIV-related sexual transmission behaviors. Several public health indicators suggest higher rates of infection with HIV and syphilis for methamphetamine-using MSM compared to MSM who do not use the drug. In communities of MSM with a high prevalence of methamphetamine use and concomitant HIV-related sexual risk behaviors, a continuum of interventions should be available to meet the methamphetamine-using MSM 'where he is at' and to assess his readiness to change. When MSM seek intervention in settings that provide primary care, HIV care or mental health services, one reasonable approach is for the care provider to engage the individual around his level of methamphetamine use (screen) and his desire for drug abuse treatment. Based on the response, a range of options can be engaged that include HIV prevention to brief intervention to one of a variety of efficacious behavioral drug abuse treatments. Such a coordinated and comprehensive approach to intervention in this high-risk group seems appropriate as we enter the third decade of the AIDS epidemic and the second decade of the epidemic of methamphetamine use in communities of MSM.

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