Methamphetamine Use and Risk for HIV/AIDS

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Methamphetamine is a stimulant drug that has been around for decades. Its popularity has waxed and waned over the years, but its use seems to be increasing in many parts of the United States and in several population subgroups. Methamphetamine is very addictive, it can be injected, and it can increase sexual arousal while reducing inhibitions. Because of these attributes, public health officials are concerned that users may be putting themselves at increased risk of acquiring or transmitting HIV infection—a valid concern, considering that methamphetamine use has been linked with increased numbers of HIV infections in some populations [1].

There is a growing body of research on methamphetamine use among men who have sex with men (MSM). Overall, assessments show that MSM who use methamphetamine may increase their sexual risk factors (for example, they may use condoms less often, have more sex partners, and may engage in practices that elevate their risk for HIV infection, such as unprotected receptive anal sex) and perhaps their HIV-related drug-use risk factors (for example, injecting methamphetamine instead of smoking or snorting it) [1].

MSM are not the only group with risk factors related to methamphetamine use. Evidence shows that heterosexual adults and adolescents under the influence of methamphetamine may also engage in practices that increase their risk for HIV infection and other sexually transmitted diseases (STDs) [2]. However, among MSM, the baseline prevalence of infections (such as HIV) and risk behaviors (such as number of partners and anal sex) tends to be higher, resulting in greater risk for transmission.

Methamphetamine users may exchange sex for money or drugs, creating another risk factor for acquiring and transmitting HIV [2].

What is becoming clear is that the use of methamphetamine can contribute to sexual risk behaviors, regardless of the sexual orientation of the user. Current data indicate a strong link between methamphetamine use and sexual risk among MSM, and perhaps among heterosexual adults and youth.

The following are facts about methamphetamine, its effects on the body, and research showing its role in increasing behaviors that put persons at risk of acquiring or transmitting HIV infection.

Methamphetamine Defined

Methamphetamine is a central nervous system stimulant categorized by the U.S. Food and Drug Administration as a Schedule II amphetamine, which means it has a high potential for abuse and for psychological or physical dependence. There are numerous slang names for methamphetamine, some of which are regional or group-specific. The most common are meth, crystal meth, Tina, ice, and glass. Methamphetamine is smoked, injected, snorted, swallowed, or inserted into the anus [3].

How Methamphetamine Is Produced

Methamphetamine can be produced through a series of fairly simple chemical steps involving a common decongestant—ephedrine or pseudo-ephedrine—in combination with products such as iodine crystals, battery acid, red phosphorous, and anhydrous ammonia. It can be formulated as

a liquid, a powder, a waxy solid (glass), or a clear rock (ice).

Methamphetamine Use in the United States

According to the Substance Abuse and Mental Health Services Administration (SAMHSA), in 2004,

- an estimated 12 million persons aged 12 and older (4.9% of US persons aged 12 or older) had used methamphetamine at least once in their lifetime
- 1.4 million persons aged 12 or older (0.6% of the US population) had used methamphetamine during the past year
- 600,000 (0.2% of the US population) had used it during the past month [4].

SAMHSA estimated that from 1993 through 2003, the rate of admissions for the treatment of methamphetamine or amphetamine abuse increased from 13 to 56 admissions per 100,000 for people aged 12 or older [5].

Studies show a higher prevalence of methamphetamine use among MSM than among the general population. For example, in a study of urban, young MSM (aged 15-22 years), conducted during 1994–1998, 20% of the participants reported having used methamphetamine during the past 6 months [6]. A 2001 study found that 15% of MSM in San Francisco had used methamphetamine during their most recent anal sex (within the past 3 months)—making methamphetamine use third only to the prevalence of alcohol and marijuana use [7].

The current increase (since the early 1990s) of methamphetamine use began in the western United States. However by the mid-2000s, its use had become a nationwide concern. The National Clandestine Laboratory Database, which includes the number of clandestine labs seized, showed an increase in the number of lab seizures in almost every state from 2000 through 2005 [8]. As of 2004, the rates of methamphetamine use were particularly high in the western states: 12 states, including California, Nevada, Wyoming, and Montana, ranked in the top third of states in terms of methamphetamine use during the past year [4].

Lab seizures and restrictions on purchasing ingredients have reduced the production of methamphetamine in the United States.

The Effects of Methamphetamine Use

As a central nervous system stimulant, methamphetamine directly affects the brain and the spinal cord by interfering with the normal release and uptake of neurotransmitters (chemicals that nerve and brain cells produce to communicate with each other). Dopamine is the primary neurotransmitter affected by methamphetamine, but norepinephrine and epinephrine are also affected.

The use of methamphetamine causes the release of large quantities of neurotransmitters. The neurotransmitters, in turn, cause increased heart rate and blood pressure levels and produce sensations of pleasure, self-confidence, energy, and alertness. They also suppress the appetite and enhance sexual arousal. Users may report sleeplessness, talkativeness, teeth grinding, increased body temperature, and compulsive behavior, such as skin picking.

Long-term use can cause physical symptoms (decayed teeth, weight loss, skin lesions, stroke, and heart attack) as well as mental symptoms (paranoia, hallucinations, anxiety, and irritability) and behavioral symptoms (aggressiveness, violence, and isolation).

The long-term use of methamphetamine can lead to reduced levels of dopamine and other neurotransmitters, making the user crave methamphetamine to raise dopamine levels. Because bingeing on the drug depletes

neurotransmitter stores, coming down from the high is often described as a "crash," which includes a phase of depression. Additional doses of methamphetamine are often used to alleviate these negative feelings. This cycle can lead to addiction, which can be very difficult to overcome.

Because methamphetamine use can cause impotence at the same time that it is increasing libido, some MSM may use erectile dysfunction medications and may then engage in unprotected receptive or insertive anal sex while under the influence of the drugs [7].

How Methamphetamine Compares with Amphetamines or Cocaine

Changes in specific parts of the brain of methamphetamine users are similar to those of cocaine and other substance users; however, methamphetamine, amphetamines, and cocaine differ in some ways.

For example, compared with amphetamines, methamphetamine has longer lasting and more toxic effects. Methamphetamine is also stronger and longer lasting than cocaine. Methamphetamine, compared with cocaine, causes a more than 3-fold release of dopamine in the brain and has a half-life (the amount of time necessary for half of the drug to be metabolized) of 12 hours, compared with cocaine's half-life of 1 hour. If smoked, it can produce a high for 8–24 hours; smoking cocaine produces a high for approximately 20–30 minutes [9]. Because its effects last longer and it is less expensive than cocaine, methamphetamine is attractive to many populations, including young people, who sometimes refer to it as "poor man's cocaine."

The Methamphetamine User

There is no typical methamphetamine user. The drug is used by people of different ages and races, in all parts of the country, and for different reasons. However, some trends have been noted in the United States.

- **Age**: Many methamphetamine users are young. Because it is cheaper and longer lasting than cocaine, methamphetamine is becoming popular with persons in their teens and early 20s [10, 11]. The average age at first use was 18.9 years in 2002, 20.4 years in 2003, and 22.1 years in 2004 [4]. The highest rate of methamphetamine use during the past year was that for young adults aged 18 to 25, followed by youth aged 12 to 17, and then adults aged 26 or older [4].
- **Sex**: Among all persons 12 years of age or older, the rate of use during the past year was about the same for males and females (0.7% and 0.5%, respectively) [4].
- **Race/ethnicity**: The largest numbers methamphetamine users are white. However, the highest rates of methamphetamine use during the past year were those for Native Hawaiians or other Pacific Islanders (2.2%), American Indians or Alaska Natives (1.7%), and person who reported 2 or more races (1.9%). Past-year use among whites (0.7%) and Hispanics (0.5%) was higher than among blacks (including African Americans) (0.2%) [4].
- **MSM**: According to data from the 2004 CDC National HIV Behavioral Surveillance System, overall, a higher percentage of MSM methamphetamine users compared to non-users were white (50.4% vs. 43.5% respectively) [10].
- **Rural users**: Many methamphetamine users in rural areas are white, working class, heterosexual young adults [12]. Trends in rural areas show that increasing numbers of Latinos, Native Americans and youth are using methamphetamine. Rural users, compared with urban users, are more likely to be heterosexual [12].

Reasons For Methamphetamine Use

The reasons for using methamphetamine vary.

- Males and females have reported using methamphetamine for increased energy and

productivity, its low cost, self-medication for depression or attention deficits, and the euphoric high [13,14].

- Males have reported using methamphetamine for economic reasons, (selling the drug, increased energy to work multiple jobs) and sexual reasons (enhanced libido and endurance) [11, 14].
- A study of HIV-positive MSM who use methamphetamine found that the most frequently reported motivation for use was to enhance sexual pleasure (reported by nearly 90% of respondents) [13]. Other reasons included self-medication of negative feelings associated with HIV-positive serostatus.
- A similar study of HIV-negative heterosexual adults found that the primary motivations for methamphetamine use were to get high, to get more energy, and to party [14].
- Females reported using methamphetamine to control weight and to combat fatigue [12].
- The culture of methamphetamine use provides a social network—a community—for persons who feel like outsiders [12].

Methamphetamine Use and HIV Risk Behaviors

A growing body of research supports the relationship between methamphetamine use by MSM and heterosexual populations and an increase in behaviors (sexual and those related to injection drug use) that can put the user at risk for HIV infection.

- A survey of users of noninjection drugs, conducted in California during the mid-1990s, showed that heterosexual persons and MSM who reported using methamphetamine also had more sex partners, were less likely to use a condom, and were more likely to exchange sex for money or drugs, have sex with an injection drug user, or to have a history of STD—all risk factors for HIV transmission [2].
- A qualitative study of gay and bisexual men in Seattle (Washington) and San Jose (California), conducted during 1997–2001, revealed a high prevalence of club drugs (methamphetamine, ecstasy, ketamine, and GHB [gamma hydroxyl butyrate]) in tandem with unsafe sex practices. Many of the respondents reported that they already had HIV infection or AIDS and that they "medicated" their symptoms through their drug use. Respondents reported engaging in unprotected sex as well as trading sex for drugs [15].
- A 2001 study conducted among gay and bisexual men in the San Francisco Bay Area showed that of MSM who participated in circuit party weekends, those who used methamphetamine were more than twice as likely to have unprotected anal sex during that weekend with a partner whose HIV status was unknown or different from theirs [16].
- According to a 1998 study conducted at publicly funded HIV testing sites in California, HIV-positive MSM may be more likely than HIV-negative MSM to use methamphetamine, and some MSM methamphetamine users may be more likely than other methamphetamine users to use it during sex [2].
- An analysis of data of heterosexual men, performed by the California Department of Health Services during 2001–2003 determined that recent methamphetamine use was associated with high-risk sexual behaviors, including anal intercourse, sex with an injection drug user, and sex with a casual or an anonymous female partner [17].
- In California, 9.5% of primary and secondary syphilis cases in heterosexual men during 2004 were cases in men with a history of methamphetamine use, continuing a trend of increases in syphilis cases, from 3.1% in 2001, 6.4% in 2002, and 7.3% in 2003 [18]. Syphilis infection is a marker for unprotected sex, a risk factor for HIV infection.
- During a gonorrhea outbreak in 6 central California counties in 2004, substantial

proportions of heterosexual men (38%) and women (28%) reported methamphetamine use, particularly when compared with MSM (8%) [17]. Like syphilis, gonorrhea infection is a marker for unprotected sex, a risk factor for HIV infection.

- Some evidence suggests that the use of methamphetamine (not injected) by heterosexual men and women is associated with unprotected vaginal sex and with a higher number of sex partners during the past 12 months [2].

In addition to increasing sexual risk factors, methamphetamine use increases the risk for HIV transmission when the drug is injected. For example, women reported being injected with methamphetamine by sex partners, often with a shared syringe [18]. According to a Colorado study, people who injected methamphetamine more frequently shared syringes during a methamphetamine binge [18].

Specific Ways Methamphetamine Use Negatively Affects Thinking and Behavior

- Methamphetamine use may impair the ability or the desire to be safe, both sexually and when injecting drugs. That impairment, in turn, may lead to experimentation with riskier behaviors in general.
- Methamphetamine may dry mucosa, which may lead to more chafing and abrasions, which, in turn, could provide an entry for HIV during sexual activity.
- Methamphetamine use is associated with sexual practices that may increase the likelihood of HIV and other STD transmission (e.g., long duration, leading to chafing or sores; multiple partners; lack of inhibition; low level of condom use).
- Methamphetamine use may cause mental confusion and impair the ability to take medications that have been prescribed for HIV infection or other conditions.

Public Health Implications

Methamphetamine use is a public health issue. There is a need for a broad approach in addressing methamphetamine use and risk for infection with HIV and other STDs—one that includes heterosexual adults and adolescents as well as MSM. HIV and STD prevention and treatment programs could be enhanced to include assessment for methamphetamine use, with referrals to methamphetamine treatment, primary testing, and sexual health promotion.

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