



The effect of non-injection drug use on sexual risk behaviours and ART adherence among men who have sex with men

? Questions

- What is the impact of non-injection drug use on sexual risk behaviour and ART among men who have sex with men?
- What are effective interventions to address the impact of non-injection drug use among men who have sex with men?

🔑 Key Take-Home Messages

- Some men who have sex with men may use various substances to overcome negative emotions (1), alleviate social unease (1), or enhance sexual experiences (1-3).
- The majority of studies focus on the use of amphetamine-group substances (such as crystal meth); two systematic reviews have found enough evidence to associate this group of substances with sexual risk behaviours among men who have sex with men (6-8).
- Interventions involving motivational interviewing (9) and personal cognitive counselling (10), have shown some effectiveness in reducing substance use and unprotected anal intercourse, with limitations.

! The Issue and Why It's Important

Substance use refers to the use of any substance, other than food or water, that impacts physiological functioning when introduced into the body (11). Specifically, substances like drugs interfere with the brain's communication system, altering an individual's capacity to make decision and experience of reward and pleasure (12). These physiological effects depend on numerous factors, such as an individual's age and body weight, the environment the drug is used in, and the type and amount of substance used.

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Men who have sex with men show higher levels of substance use compared to the general population (14-16). This is of particular concern as substance use has been linked to an increased risk of HIV transmission (17) and men who have sex with men account for more than half of all new HIV infections in Canada and the United States (18, 19).

Substance use contributes to the spread of HIV in two primary ways: by impairing an individual's ability to make safe choices when engaging in sexual activities, and by causing people to share needles and other drug equipment (20). This review does not focus on the particular risks associated with injection drug use; rather, evidence is presented on the physiological effects of substance use and how they may affect sexual risk behaviours and ART adherence among men who have sex with men.

What We Found

In the context of sexual encounters, some men who have sex with men may use drugs for a variety of reasons. This includes enhancing social experiences (21), dealing with sexual unease (1, 22), cognitive escape from concern regarding sexual risk (23), heightened sexual sensation (2, 3) and increased duration of sex (2, 22). However, not all drugs induce the same effect. For example, “poppers,” amphetamines, and ecstasy are substances associated with increased sexual intensity, while methamphetamine and erectile dysfunction medication are used to increase duration of intercourse (14).

While a body of literature exists on the link between the use of certain drugs and increased risk of engaging in unprotected anal intercourse among men who have sex with men (4, 5, 24-26), the causal nature of these associations is difficult to identify as different combinations of drugs can be taken together as well as sequentially (27). Nonetheless, there is evidence of an association between taking certain drugs and sexual risk behaviours among men who have sex with men.

Amphetamine-group substances and other stimulants

Amphetamine-group substances are powerful stimulants that affect the body's central nervous system (13). This drug family is comprised predominately of methamphetamines and amphetamines, and excludes ecstasy-group substances (28). Generally, amphetamine-group substances are associated with sexual risk taking in the form of unprotected sex, sex with multiple partners, and long sexual episodes (27). A 2015 systematic review and meta-analysis focused on men who have sex with men in high-income countries found that associations between amphetamine-group substances and HIV infection were statistically significant

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11. Drug Aware. What are drugs? <http://drugaware.com.au/getting-the-facts/faqs-ask-a-question/what-are-drugs/#what-is-a-drug> (accessed July 28, 2017). 2017.

across three types of study designs (cross-sectional, case-control, and longitudinal) (5).

Methamphetamine (also known as crystal meth, or speed) is a highly addictive substance within the amphetamine drug family. It induces euphoria and increases alertness, energy, confidence, and libido (13, 29). One systematic review examined event-level studies in high-income countries among men who have sex with men who use drugs before or during sex; authors found that methamphetamine use was the only drug consistently associated with sexual risk behavior in multivariate analysis (30). Another systematic review across 61 American studies found that HIV-positive men who have sex with men who use crystal meth were more likely to report serodiscordant unprotected anal intercourse and sexually transmitted infections (4). Additionally, use of crystal meth was linked to suboptimal ART adherence and diminished HIV-related health outcomes (4).

Two cross-sectional studies examining stimulant use in general among men who have sex with men in high-income countries had similar results: the odds of engaging in unprotected anal intercourse were higher for those reporting use of stimulants (31, 32). Another study using event-level analysis (i.e., diary method) among a sample of HIV-positive men who have sex with men in New York City found that stimulants were strongly associated with unprotected anal intercourse (6).

Inhalants

Inhalants are a group of substances that are primarily administered by inhalation, and include solvents, aerosols, gases, and organic nitrites (33). The inhalants primarily explored in the literature were alkyl nitrites, also known as “poppers.” In addition to inducing a psychoactive state, poppers are used by some men during intercourse to relax muscles and stimulate blood flow (34). Poppers are associated with weakening of the immune system as well as transmission of HIV and hepatitis (34).

One American study involving a sample of men who have sex with men found that participants who used poppers were nearly three times as likely to engage in unprotected anal intercourse (8). A second study found that certain inhalants, including poppers and whippets (whipped cream aerosol cans containing nitrous oxide) were associated with unprotected anal intercourse among men who have sex with men in New York City (6). Another study involving men who have sex with men in San Francisco found that HIV-negative participants who used amyl nitrate were more likely to engage in unprotected anal intercourse with an HIV-serodiscordant partner (7).

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Erectile dysfunction medication

Recreational use of erectile dysfunction medication (e.g., sildenafil, also known as Viagra) among men who have sex with men was the primary type of prescription drug misuse that appeared in the literature. While prescription use of this drug is legal, the number of men taking erectile dysfunction medication who do not have a medical indication is increasing (35). Erectile dysfunction among HIV-positive men who have sex with men is more prevalent, as some HIV-related medical conditions may be associated with erectile dysfunction (36).

One study from Australia found that men who have sex with men who used erectile dysfunction medication were more sexually active overall and used the drug to enhance sexual experiences; however, the authors found that use was not specifically for the purpose of risk-taking (37). Nonetheless, another study across a large sample of European men (74.5% of the sample identifying as men who have sex with men) found that erectile enhancing medication was associated with an increase in sexual risk behaviours and that nonmedical use was associated with an increase in the concurrent use of party drugs (38).

One study, involving a sample of gay and bisexual men in the U.S., examined the context in which sildenafil and club drugs (e.g., cocaine, GHB, ketamine, MDMA, methamphetamine) were used. The study found that the environment (e.g., sex parties and gay circuit parties) plays a large role in usage. This same study also showed that sildenafil in combination with club drug use was less likely to occur among men of colour, but more likely to occur among older men (39). Another study examining recent HIV infection among men who have sex with men in San Diego found that that recent HIV infection was strongly associated with the use of methamphetamine and nitrites, but not with erectile dysfunction medication (40).

Chemsex

Chemsex is a specific form of recreational drug use, defined as the intentional use of one or more particular drugs (i.e. “chems”) before or during sex (41). The specific drugs used include mephedrone, methamphetamine, gamma hydroxybutyric acid (GHB), and gamma butyrolactone (GBL); when used combination, these drugs can reduce inhibitions and enhance pleasure (21, 42, 43). Chemsex is distinct from sex that may occur coincidentally after drug use in a social setting (e.g., at a party or club) (44). One of the social drivers of chemsex is smartphone apps, a technological advancement that facilitates finding more sexual partners and provides an additional avenue to access drugs (43, 45).

18. Public Health Agency of Canada. <https://www.canada.ca/content/dam/canada/health-canada/migration/healthy-canadians/publications/diseases-conditions-maladies-affections/hiv-aids-estimates-2014-vih-sida-estimations/alt/hiv-aids-estimates-2014-vih-sida-estimations-eng.pdf> (accessed July 26, 2017). 2015.

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One study in South London identified two main motivators for chemsex: it allows men to have the sex they desire by increasing libido, stamina, and confidence; and drugs enhance the quality of the sexual experience (22). A second study, which appeared to use the same study population, examined the relationship between drug use and the transmission risk of HIV and other sexually transmitted infections. Overall, the authors were unable to identify evidence that chemsex significantly influenced the decision to engage in condomless anal intercourse, though it did facilitate sex with multiple partners and for longer periods of time (44). However, authors note that approximately 25% of the study sample had strict personal rules about using condoms during casual sex.

Drug use and ART adherence

Two studies explored how methamphetamine use affects ART adherence among men who have sex with men. One study among a sample of gay and bisexual men living with HIV in New York City found that, on a given day, men who used methamphetamines were more than twice as likely to report non-adherence (46). Similarly, another study in San Francisco found that methamphetamine use was significantly associated with poor anti-retroviral adherence among men who have sex with men and heterosexual men living with HIV (47).

Interventions to address sexual risk, drug use, and adherence among men who have sex with men who use drugs

A meta-analysis of high-intensity behavioural interventions from 2010 found that interventions for reducing the use of amphetamine-group substances had only a moderate effect size (27). Of the 13 included studies, three were focused on men who have sex with men in high-income countries. These interventions included cognitive behavioural therapy and contingency management (48), gay-specific cognitive behaviour therapy (48, 49), and one behavioural intervention that was comprised of counselling sessions, skills-training, and problem solving (50). Sexual risk and the use of amphetamine-group substances were outcomes across all four interventions.

A more recent systematic review from 2016 examined behavioural interventions aimed at substance use among men who have sex with men (51). From twelve included trials, the authors identified only one intervention that decreased both condomless anal intercourse and substance use (9) and two (10, 50) that aimed to reduce condomless anal intercourse. Two of these three interventions (9, 10) are included in the Centre for Disease Control's Compendium of Evidence Based Interventions and Best Practices for HIV Prevention:

25. Purcell DW, Parsons JT, Halkitis PN, Mizuno Y, Woods WJ. Substance use and sexual transmission risk behavior of HIV-positive men who have sex with men. *Journal of Substance Abuse*. 2001;13(1-2):185-200.

26. Chesney MA, Barrett DC, Stall R. Histories of substance use and risk behavior: Precursors to HIV seroconversion in homosexual men. *American Journal of Public Health*. 1998;88(1):113-6.

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- Young Men’s Health Project – This individual-level intervention is aimed at men who have sex with men who engage in recreational drug use (9). Participants were 143 HIV-negative or status unknown young gay and bisexual men from New York City who reported recent unprotected anal intercourse and recreational drug use. Men were randomized into two groups: motivational interviewing sessions (n=73) or educational sessions (n=70). In the motivational interviewing sessions, men learned about the risks associated with condomless sex and drug use. Additionally, participants identified which behaviours they would like to change and created a plan that addressed barriers and goals. Among the intervention participants, unprotected anal intercourse with a casual partner in the last 30 days significantly decreased when controlling for drug use.
 - Project ECHO: This individual-level intervention in San Francisco uses personalized cognitive counselling tailored specifically to men who have sex with men and use substances engaging in high-risk sexual behaviours (10). Men who have sex with men and use substances were randomized to two groups: personalized cognitive counselling (one 30-50 minute session plus one booster session three months later) and HIV testing (n=162), or HIV testing alone (n=164). Significant reductions in unprotected anal intercourse were observed in the personalized cognitive counselling group, though this was primarily seen among men not dependent on substances. Compared to the control group, men who received the intervention were also more likely to report abstinence from alcohol, marijuana, and erectile dysfunction medication (52).
 - Two interventions listed in the Centre for Disease Control’s Compendium of Evidence Based Interventions and Best Practices address adherence to ART for people living with HIV who use drugs (both non-injection and injection) (53, 54). Both of these interventions are forms of directly observed medication administration. However, neither intervention is specifically targeted at men who have sex with men, nor do the studies identify whether any men who have sex with men were included in the study samples.
32. Li J, McDaid LM. Alcohol and drug use during unprotected anal intercourse among gay and bisexual men in Scotland: What are the implications for HIV prevention? *Sexually Transmitted Infections*. 2014;90(2):125-32.
 33. National Institute on Drug Abuse. Drug Facts: Inhalants. https://www.drugabuse.gov/sites/default/files/drug-facts_inhalants.pdf (accessed August 3, 2017). 2012.
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Factors That May Impact Local Applicability

Almost all of the studies included in this rapid response were among men who have sex with men residing in urban centres in developed countries; namely, the United States, Australia, the United Kingdom, and Europe. However, this does not mean that all findings are applicable to the local Canadian context; the section on chemsex uses a combination of peer-reviewed and grey literature exclusively from the United Kingdom. Additionally, across included studies, there was some variance in what substances were included when larger drug classification terms (e.g. stimulants) or colloquial language (e.g. chemsex) were used.

What We Did

We searched Medline using a combination of text terms (gay or men who have sex or homosexual* or bisexual* or MSM or queer) and [text terms (drug use* or drug abuse* or crystal meth* or polydrug* or party drug* or popper* or cocaine or amphetamine* or chemsex or poly-substance abuse or poly-substance use* or mephedrone or m-cat or meow or MDMA or LSD or GHB or GBL or Hydroxybutyric acid or PNP or party or ecstasy or ketamine or crack) or MeSH terms (Methamphetamine or Amphetamine-Related Disorders or Cocaine-Related Disorders or Cocaine or Crack Cocaine or Street Drugs or Amphetamine)]. Reference lists of identified literature reviews and systematic reviews were also searched. All searches were conducted on July 12, 2016 and results were limited to English articles published from 2006 to present in high-income countries. The search yielded 1,977 references from which 52 studies were included. Sample sizes of primary studies ranged from 30 to 6,195.

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Rapid Response: Evidence into Action

The OHTN Rapid Response Service offers quick access to research evidence to help inform decision making, service delivery and advocacy. In response to a question from the field, the Rapid Response Team reviews the scientific and grey literature, consults with experts, and prepares a brief fact sheet summarizing the current evidence and its implications for policy and practice.

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Prepared by

Danielle Giliauskas

Program Leads / Editors

Katherine Murray

Contact

rapidresponse@ohtn.on.ca

For more information visit

www.ohtn.on.ca/rapid-response-service



THE ONTARIO HIV
TREATMENT NETWORK

The Ontario HIV Treatment Network
1300 Yonge Street, Suite 600
Toronto ON M4T 1X3

www.ohtn.on.ca

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