Risk behaviours of an interrelated syphilis-infected sexual network of MSM.pdf

Richie Diesterheft, DePaul University
John Brady, DePaul University
Mona Shattell, PhD, RN, FAAN

Available at: https://works.bepress.com/mona_shattell/107/
Aims and objectives. We examined the risk behaviours in an interrelated sexual network of 33 syphilis-infected men who have sex with men on the use of condoms, substances and websites to meet sexual partners. Our study used a descriptive exploratory design to investigate co-occurring high-risk behaviours in this interrelated sexual network to inform future health interventions and research directions.

Background. Although the risk behaviours for human immunodeficiency virus transmission in men who have sex with men have been studied, few have studied the high-risk population of men who already have syphilis, and even fewer have studied the risk behaviours in sexual networks of syphilis-infected men who have sex with men who were identified using contact tracing.

Design/Methods. The data were collected from semi-structured, individual interviews at a not-for-profit lesbian, gay, bisexual and transgender health centre in a large city in the Midwestern USA.

Results. Inconsistent condom use was substantial during both insertive (92%) and receptive (88%) anal intercourse. Most participants (97%) reported using one or more substances prior to or during anal intercourse, and Internet websites were the most common place to meet sexual partners (88%).

Conclusions. High-risk behaviours were significant within this syphilis-infected sexual network of men who have sex with men. The majority of our 33 participants were non-Hispanic Whites (n = 27, 82%), possessed a baccalaureate degree or higher (n = 23, 70%), and actively sought out unprotected anal intercourse [21 participants (64%) used BareBackRT.com, a website to seek out unprotected anal intercourse].

Relevance to clinical practice. Nurses should be more informed about the risk factors of a high-risk sexual network of syphilis-infected men who have sex with men. Interrelated sexual networks have high levels of similarity among participants’ high-risk behaviours; contact tracing may be used to identify relevant risk-reduction interventions before they become necessary to patients.

Key words: AIDS, barebacking, HIV, Internet, men who have sex with men, risk behaviour, risk reduction, sexual behaviour, substance use, syphilis, unprotected anal intercourse, unprotected sex

Accepted for publication: 17 December 2015

Authors: Richie Diesterheft, MSN, RN, CGRN, Endoscopy Nurse, Former Disease Intervention Specialist, Former Graduate Student, School of Nursing, DePaul University, Chicago, IL; John P Brady, BA, Graduate Student, Department of Psychology, DePaul University, Chicago, IL; Mona Shattell, PhD, RN, FAAN, Professor and Chairperson, Department of Community, Systems, and Mental Health Nursing, Rush University and Former professor, School of Nursing, DePaul University, Chicago, IL, USA

Correspondence: Mona Shattell, Professor and Chairperson, Department of Community, Systems, and Mental Health Nursing, College of Nursing, Rush University, 600 South Paulina Avenue, Suite 1078A, Chicago, IL 60612 USA. Telephone: +1 312 942 4051. E-mail: mona_shattell@rush.edu

What does this paper contribute to the wider global clinical community?

- Understanding co-occurring risk factors in an interrelated group of syphilis-infected MSM may inform nurses and other healthcare professionals about relevant topics for their patients.
- Applicable harm-reduction strategies are examined for high-risk MSM populations.
- If future research on interrelated sexual networks show high levels of similarity among participants’ risk behaviours, contact tracing may be used to identify relevant risk-reduction interventions before they become necessary to patients.
- We identify the necessity of future research regarding Internet websites specifically used to find sexual partners for UAI among men who seek out ‘bareback’ sex.
- Early detection and treatment is critical to reducing syphilis transmission and negative outcomes of long-term infection.
**Introduction**

Syphilis rates have steadily increased in the USA, which is a trend that has largely been driven by men who have sex with men (MSM) and who account for a disproportionate amount of sexually transmitted infections (STIs), such as human immunodeficiency virus (HIV) (CDC 2014b, 2015; Gee 2005). The MSM population in the USA is an estimated 3.5–4.4% of adult males, although estimates of the proportion of men who engaged in same-sex sexual behaviour differed by recall period: past year = 2.9% (95% CI, 2.6–3.2%); past five years = 3.9% (3.5–4.4%); ever = 6.9% (5.1–8.6%) (Purcell et al. 2012). The estimated proportion of primary and secondary syphilis cases that could be attributed to MSM increased from 7% in 2000–64% in 2004 (CDC 2014c). Although they comprise a small portion of the population, MSM accounted for 75% of all primary and secondary syphilis cases in 2013 and 63% of all new HIV infections in 2010 [CDC 2015; U.S. Department of Health & Human Services (HHS) 2014]. Some studies attribute these high rates to unprotected anal intercourse (UAI), multiple sex partners and sex work (Chen et al. 2002, Karp et al. 2008; CDC 2014c). The CDC notes that MSM is an underserved population with rates of infection higher among those of lower socioeconomic status and racial/ethnic minorities who suffer from additional societal inequalities (CDC 2014c). Another important factor in the high STI transmission rates for MSM is technology. Internet access has drastically increased over the past decade with more users than ever connecting (Davis et al. 2006) via laptop computers or handheld devices (e.g. tablets and smartphones). Among the many other functions, the Internet is used to seek sexual partners (Ross et al. 2007, Downing 2012). MSM who engage in high-risk behaviours, such as UAI and substance use, now have the ability to build close-knit networks using instantaneous and anonymous communication.

**Background/literature review**

The CDC defines syphilis infection as ‘a sexually transmitted disease (STD) caused by the bacterium Treponema pallidum. It has often been called ‘the great imitator’ because so many of the signs and symptoms are indistinguishable from those of other disease’ (CDC 2014a). Syphilis infection is determined in accordance with the CDC’s syphilis testing algorithm: a reactive Rapid Plasma Reagin (RPR), a syphilis-specific enzyme immunoassay (EIA) and/or Fluorescent Treponemal Antibody absorption (FTA-Abs). Individuals with a medical history of syphilis require an increase in the RPR titre of three or more dilutions from the most recent test. Syphilis symptoms such as one or multiple chancres (or genital ulcers); diffuse, bilateral rashes (often non-pruritic); mucous patches or condyloma lata; alopecia (patchy hair loss); and lymphadenopathy are used to determine the stage of syphilis and the duration of infection.

Persons infected with syphilis have a two-to-five fold increased risk for HIV infection if exposed to breaks in the skin barrier caused by sores or chancres (Workowski & Berman 2002, AHC Media 2003, p. 122, Erbelding & Rompalo 2004, CDC 2014a). Sores can bleed, allowing direct contact between an infected person’s mucous membranes and the bloodstream of the uninfected person (CDC 2014a). Although researchers have studied risk behaviours for HIV transmission in MSM (Finlayson et al. 2011, Forney et al. 2012), few have studied risk behaviours for syphilis infection (Chew-Ng et al. 2013) and the risk population of those who already have syphilis (MMWR 2013), and even fewer have studied specific sexual networks of syphilis-infected MSM, particularly those identified through contact tracing. Therefore, the purpose of this study was to explore the risk behaviours of an interrelated sexual network of syphilis-infected MSM on the use of condoms, substances and websites to meet sexual partners.

**Methods**

**Design**

The study used a descriptive exploratory design and previously collected data that was obtained through services at a large urban lesbian, gay, bisexual and transgender (LGBT) Health Center in the Midwestern United States. We sought to explore and describe behaviours of this interrelated network of syphilis-infected MSM.

**Definitions of the key terms**

*Men who have sex with men*

Men who have sex with men is defined as men who engage in sexual activity with other men regardless of their sexual identity (i.e. gay, homosexual, or bisexual) (CDC 2015). This study chose to use ‘Men who have sex with men’ or ‘MSM’ because all of the individuals were born male and specified to have only male sexual partners. None of the individuals stated that they engaged in sexual activity with a biological woman during the last year. However, the direct question of ‘How would you identify your sexual identity?’ was purposefully not part of the questionnaire because the health centre where interviews were conducted serves all sexualities, regardless of one’s sexual identity. Additionally, we only asked about sexual partners within the last 12 months because the syphilis infectious period is...
limited to this time period. For these reasons and the purpose of this study, sexuality was determined by the patient’s sex and the sex of their sexual partners.

Unprotected anal intercourse
Unprotected anal intercourse is considered a high-risk sexual practice and is known to be the riskiest of all forms of sexual intercourse due to the vulnerability of the rectum and sphincter tissues (Delvin, 2011). The term ‘bareback sex’ or ‘barebacking’ is loosely used interchangeably with UAI, although the definition of bareback sex focuses on the intentional practice of unprotected sex (Halkitis & Parsons 2003). Halkitis and Parsons (2003) present evidence that this particular behaviour has various potential health threats: (1) UAI can result in new HIV infections in addition to transmission of more virulent and drug resistant strains of the virus that have emerged; (2) among HIV-positive men, barebacking may result in reinfection with more potent strains of HIV; (3) UAI may lead to transmission of other STIs including syphilis. According to Crepaz et al. (2009), the practice of UAI has a higher prevalence among those who are HIV-positive.

Substance use
Substance use is defined as the use of any substance for personal enjoyment, whether illicit or not, without medical justification. This study collected data on the use of alcohol, methamphetamine, nitrates (also known as poppers), marijuana, gamma hydroxybutyric acid (GHB) and ketamine (referred to as ‘club drugs’ in our study), sildenafil, cocaine and heroin. Federal requirements only inquire specifically about crack, cocaine, heroin, methamphetamines, nitrates and erectile dysfunction medications (e.g. sildenafil). For the purpose of this study, we chose to focus on alcohol, methamphetamine, poppers/nitrates, and marijuana strictly because of the high percentage of use within the sexual network.

Demographics
All of the participants were patients at a large involved with a not-for-profit health clinic primarily serving the LGBT community in a large city in the Midwestern United States. The institutional review boards of DePaul University and the health centre approved the study. The data were collected as part of a large public health disease intervention programme that involved contact tracing. The intervention programme elicited information from participants about sexual partners, risk behaviours, sex-seeking behaviours and substance use. There were 93 individual patients interviewed, with a total of 114 sexual partners. Twenty-four sexual partners were elicited during initial interviews and 90 additional partners during re-interviews. Follow-up interviews were conducted after the initial interview; re-interviews were performed through various methods including on the phone, online or in-person. There were a total of 73 re-interviews with an average of 2.6 interviews per patient. The average number of sexual partners was 3.7 per individual patient during the past year. This study only focuses on those who were identified to be both interrelated sexually to a single sexual network and also syphilis infected, which is how we arrived at our final sample size of 33 persons. The men were sexually interrelated either by having sex with the first patient or having sex with one of the sexual partners named by said first patient.

Procedures, instrumentation and data collection
Except for the first syphilis-infected man, other potential participants were identified through contact tracing either after being notified by disease intervention specialists of syphilis exposure, or at the time a person sought care for syphilis symptoms. All of the potential participants who tested positive for syphilis agreed to participate in the study. Disease intervention specialists collected data using semi-structured, individual questionnaires during the initial interviews either in-person at a primary care site or clinic, or over the telephone. Each person provided verbal consent to participate in the interviews with the understanding that they could refuse to answer any question or stop the interview at any time. Syphilis is a federally mandatory reportable STI. Given this, semi-structured interviews are the basis of contact tracing with questions specific to mandatory federal (CDC), state and local county morbidity reporting and in accordance with their interview record forms. All of the disease intervention specialists who conducted the interviews were trained on how to efficiently and effectively obtain information. Each disease intervention specialist completed tracking forms that were then submitted for surveillance.

Questions were semi-structured versus structured to elicit sexual partners, not only those who have already been identified, notified and/or treated, but also to further identify newly infected persons (with the primary goal of halting the spread of infection). The questionnaire included 39 items divided into three sections: (1) demographic information (10 questions; questions such as ‘What is your primary race?’), (2) interview questionnaire (24 questions; questions such as ‘Where do you commonly meet your sexual partners?’) and (3) partner elicitation (five questions; questions such as
‘Whom can I assist you in notifying about possible exposure?’). The questionnaires were read to each participant whose response was recorded on a hard copy of the questionnaire and then later entered into Excel. Each initial interview length ranged from 10–60 minutes. No monetary incentives were provided; however, participants were educated on syphilis symptoms, modes of transmission and treatment. Anonymous partner notifications were also provided.

Analysis

The data were entered in Excel and then analysed using mean, mode, ranges and frequency distributions.

Results

Sample demographics

The total network sample was comprised of 33 syphilis-infected MSM who were identified over a 10-month time period. All 33 men in our sample (median age = 30 years, range from 22–50 years) were diagnosed with syphilis [5 in the primary stage (15%), 14 in the secondary stage (42%) and 14 in the early latent stage (42%)]. Diagnoses were based on presenting symptoms at the time of the interview and sexual relations with a syphilis-positive male partner within the last 12 months. Participants included non-Hispanic Whites (n = 27, 82%), Hispanics or Latinos (n = 4, 12%) and non-Hispanic Blacks (n = 2, 6%). The majority of the sample possessed a baccalaureate degree or higher (n = 23, 70%), whereas one subject had an associate degree (3%) and nine had a high school diploma (27%). Approximately one quarter (n = 8, 24%) of the sample reported being previously diagnosed and treated for syphilis, and just under half (n = 14, 42%) had tested positive for one or more STIs besides syphilis or HIV during their lifetime. Fifty-five percent (n = 18) had previously been diagnosed with HIV, whereas 15% (n = 5) were newly diagnosed with HIV at the time of syphilis diagnosis, which resulted in an HIV prevalence of 70% (n = 23) among the network. See Table 1.0 for Sample Description.

Unprotected anal intercourse

The majority of persons in this sexual network of syphilis-infected MSM rarely or never used condoms during sexual activity. When asked about their anal intercourse preferences and behaviours during the last 12 months, 29 men (88%) out of 33 in our sample identified themselves as a receptive partner/’bottom’, and 25 (76%) identified themselves as being an insertive partner/’top’. Our categories for insertive

<table>
<thead>
<tr>
<th>Table 1 Sample demographics and condom use</th>
<th>Participants (n = 33)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ethnicity</strong></td>
<td><strong>n</strong></td>
</tr>
<tr>
<td>Non-Hispanic white</td>
<td>27</td>
</tr>
<tr>
<td>Hispanic</td>
<td>4</td>
</tr>
<tr>
<td>Non-Hispanic black</td>
<td>2</td>
</tr>
<tr>
<td><strong>Stage of syphilis</strong></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>5</td>
</tr>
<tr>
<td>Secondary</td>
<td>14</td>
</tr>
<tr>
<td>Early latent</td>
<td>14</td>
</tr>
<tr>
<td><strong>HIV status</strong></td>
<td></td>
</tr>
<tr>
<td>previously positive</td>
<td>18</td>
</tr>
<tr>
<td>Never positive</td>
<td>10</td>
</tr>
<tr>
<td>Dual HIV/syphilis diagnosis at time of interview</td>
<td>5</td>
</tr>
<tr>
<td><strong>Previous syphilis diagnosis</strong></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>8</td>
</tr>
<tr>
<td>No</td>
<td>25</td>
</tr>
<tr>
<td><strong>Previous STI history (other than Syphilis &amp; HIV)</strong></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>14</td>
</tr>
<tr>
<td>No</td>
<td>19</td>
</tr>
<tr>
<td><strong>Highest level of education attained</strong></td>
<td></td>
</tr>
<tr>
<td>High school degree</td>
<td>9</td>
</tr>
<tr>
<td>Associates degree</td>
<td>1</td>
</tr>
<tr>
<td>Undergraduate</td>
<td>16</td>
</tr>
<tr>
<td>Graduate</td>
<td>5</td>
</tr>
<tr>
<td>Doctorate</td>
<td>2</td>
</tr>
<tr>
<td><strong>Insertive partner (’Top’)</strong></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>25</td>
</tr>
<tr>
<td>No</td>
<td>8</td>
</tr>
<tr>
<td><strong>Insertive condom use</strong></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>8</td>
</tr>
<tr>
<td>Sometimes</td>
<td>15</td>
</tr>
<tr>
<td>Always</td>
<td>2</td>
</tr>
<tr>
<td><strong>Receptive partner (’Bottom’)</strong></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>29</td>
</tr>
<tr>
<td>No</td>
<td>4</td>
</tr>
<tr>
<td><strong>Receptive condom use</strong></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>10</td>
</tr>
<tr>
<td>Sometimes</td>
<td>15</td>
</tr>
<tr>
<td>Always</td>
<td>4</td>
</tr>
<tr>
<td><strong>Oral condom use</strong></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>31</td>
</tr>
<tr>
<td>Sometimes</td>
<td>1</td>
</tr>
<tr>
<td>Always</td>
<td>0</td>
</tr>
<tr>
<td>Not practiced/did not respond</td>
<td>1</td>
</tr>
<tr>
<td><strong>Never uses condoms</strong></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>9</td>
</tr>
<tr>
<td>No</td>
<td>24</td>
</tr>
</tbody>
</table>
29 men who identified as a receptive partner, 25 men (86%) reported sometimes or never using a condom.

Most of the sample (97%, n = 32) reported engaging in oral sex. Of those who reported engaging in oral sex, 97% (n = 31) never used protection such as condoms or dental dams. Two men out of the 33 study participants (6%) either did not engage in anal intercourse or refused to answer the questions about insertive and receptive anal intercourse and condom use. One of these two men was the sole participant who reported sometimes using condoms for oral sex.

Twenty-seven per cent of the network never used condoms for any sexual activity (insertive/top anal intercourse, receptive/bottom anal intercourse, or oral sex, n = 9). Only 6% (n = 2) of the insertive partners and 12% (n = 4) of the receptive partners reported always using condoms.

**Substance use**

Nearly, all of the individuals (97%, n = 32) reported using one or more substances prior to or during anal intercourse within the past 12 months. The majority (n = 27, 82%) reported using more than one substance at a time: 15% (n = 5) reported one substance, 27% (n = 9) reported two substances, 33% (n = 11) reported three substances, 15% (n = 5) reported four substances and 6% (n = 2) reported five substances. The most commonly reported substances were alcohol (73%, n = 24), methamphetamine (61%, n = 20), nitrates (i.e. poppers) (58%, n = 19), marijuana (36%, n = 12), and club drugs (36%; n = 12, e.g. GHB or ketamine). Sildenafil (21%, n = 7), cocaine (9%, n = 3) and heroin (3%, n = 1) were less commonly reported. Of the 20 men who reported methamphetamine use (61%), six reported using needles for administration.

**Sex-seeking locations**

Eighty-eight per cent of our sample (n = 29) reported having sexual intercourse with an anonymous sex partner, defined as someone they had never met before or for whom they had no contact information. When asked where persons in this syphilis-infected network of MSM met their sexual partners, the most common responses included Internet websites (n = 30, 91%), bars (n = 15, 45%), bathhouses (n = 15, 45%), through friends (n = 7, 21%), and adult bookstores (n = 5, 15%). Other locations were the Grindr smartphone application (n = 2, 6%), sex parties (n = 3, 9%), the gym (n = 3, 9%), streets (n = 1, 3%), and sports teams (n = 1, 3%).

The data were further analysed regarding seeking sex or relationships online. As more individuals have access to this technology, the modes of communication and interaction have evolved within MSM communities. Meeting potential sex partners via the Internet is now common between MSM (Elford et al. 2001, Halkitis & Parsons 2003, Liau et al. 2006, Shilo & Mor 2015). Of the 30 participants in the sexual network who reported using the Internet to seek sex, social connections, or relationships, 60% (n = 18) used ManHunt and 70% (n = 21) used BareBackRT, a website used to specifically seek out UAI. Eleven of our participants (37%) who used the Internet to seek sex, social connections or relationships used both websites. Of the 30 men who reported using these Internet websites, other websites that were named as being used were: Adam4Adam (n = 8, 27%), Craigslist (n = 5, 17%), Bear411 (n = 3, 10%), Gay.com (n = 1, 3%), AOL.com (n = 1, 3%), Recon (n = 1, 3%), Man4Now (n = 1, 3%) and Poz.com (n = 1, 3%).

**Limitations**

Participants in our study were mostly non-Hispanic white (n = 27, 82%), college-educated (n = 23, 70%), and involved in several high-risk activities: UAI, sexual activity with anonymous partners, and multiple substance use. Although the overwhelming majority of early syphilis cases in our study’s city are MSM (88%), our study’s sample does not reflect current increased infection rate trends in adolescents and non-Hispanic Blacks (CDC 2013a). As of the 2010 census, the city where our research was conducted possessed the following population demographics: non-Hispanic white population (31%), college-educated (23%), and Hispanic or Latino population (28%). (U.S. Census Bureau, 2010). However, in our sample population, Hispanics or Latinos make up only 12% (n = 4) of the sample and non-Hispanic Blacks only 6% (n = 2). The demographics of our interrelated sexual network are not representative of the racial/ethnic makeup, the average level of education or substance use among the city’s population.

Furthermore, our study focused on a small sample and is intended to spur additional research of behaviours within interrelated high-risk sexual networks of MSM. Our small sample size could lead to over-generalisation and correlations between high-risk behaviours that may not be observed if the number of participants was higher. Our sample is not representative of all MSM; if our sample network expanded outside of a LGBT health centre to the general MSM population, we would likely see more varied attitudes about UAI and substance use. Although the small sample size is important to note, it is also important to note the high number of sex partners named by those infected. This specific subgroup of MSM participates in several high-risk sexual behaviours that can easily impact other...
individuals beyond the subgroup due to their high number of sexual partners. In addition, because our study focused on one specific sexual network of MSM, this study increased the understanding and awareness regarding how risk factors tie one sexual network together, which could be used in future studies that may eventually lead to decreased infection rates in sexually interrelated groups.

Discussion and implications

This study provides a glimpse into the sexual lives of a single interrelated, syphilis-infected network of MSM. Risk behaviours were dramatic and significant – most participants had inconsistent condom use, substance use before and during sexual activity, and used the Internet to meet sexual partners. Our sample population could provide insight into HIV networks because most of our syphilis-infected sample of MSM was also HIV infected. Prior to this study, there was scant research on the risk behaviours among such a unique, high-risk sexual network. Based on information obtained on the risk behaviours in this group of MSM, several nursing practices can be used to improve the health of their patients and communities.

There are many ways that nurses can help their patients manage their sexual health. Although condoms remain extremely effective at reducing the transmission of STIs in sexually active individuals (CDC 2013b), some patients do not use them consistently. Condom use during insertive or receptive anal sex was found to be extremely low, and condoms were almost never used for oral sex. These findings are consistent with several other studies of MSM (e.g. Calabrese et al. 2012, D’Anna et al. 2012). Perhaps not surprising, Peterson et al. (2012) found that less motivation to use condoms was significantly associated with more UAI. Calabrese et al. (2012) found that men who perceived loss of pleasure with condoms were less likely to use condoms during high-risk sexual activities, such as insertive and receptive anal intercourse, and this suggests that condom developers should consider pleasure in their design.

In patients who are HIV-negative, education regarding the option of pre-exposure prophylaxis (PrEP) could be extremely beneficial in preventing the spread of HIV infection, although it does not prevent the spread of other forms of STIs such as syphilis (CDC 2015c). PrEP is an oral medication taken daily to help prevent HIV infections (CDC 2015c). As the CDC states, ‘PrEP is a powerful HIV prevention tool and can be combined with condoms and other prevention methods to provide even greater protection than when used alone. However, people who use PrEP must commit to taking the drug every day and seeing their health care provider for follow-up every three months (CDC 2015c). Nurses need to speak with their patients regarding these additional commitments when discussing PrEP.

Nurses may consider examining computer-mediated interventions such as those suggested by DiNapoli et al. (2014), which might encourage healthier behaviours. DiNapoli et al. (2014) note, ‘The Healthy People 2020 report has identified that isolation, lack of social services, and a shortage of culturally competent providers serve as barriers to the health of LGBT individuals who have HIV/AIDS’ (p. 91). Furthermore, ‘The use of technology-enabled social and community support and group interventions through computer mediated self-help (CMSH) with LGBT individuals may help meet mental health needs of this group, and support healthy lifestyle practices’ (p. 91). Computer-mediated interventions need to undergo further testing to estimate usability and validity in high-risk MSM populations.

In this sexual network of syphilis-infected MSM, there were high rates of UAI, which may be related to the high frequency of substance use. A harm-reduction model of nursing care for persons with substance use problems may be beneficial for this population (Bartlett et al. 2013). Nearly all of the participants reported using one or more substances prior to or during anal intercourse. Several studies have demonstrated that men reporting UAI have more frequent use of crystal methamphetamine in the previous three months (Mansergh et al. 2002), are more likely to use club drugs (Halkitis & Parsons 2003), and have a higher prevalence of any unsafe sexual intercourse with anonymous men or those of an unknown HIV-status (Goodroad et al. 2000, Berg 2008, Carballo-Díéguez et al. 2009, Zablotska et al. 2011).

This high-risk sexual network of MSM uses the Internet and a variety of websites to seek out sexual partners. Our findings that link sex-seeking behaviour on Internet websites to unsafe sexual behaviours in the MSM are consistent with those of several other studies (Elford et al. 2001, Halkitis 2001, Halkitis & Parsons 2003, Parsons 2004, Blackwell 2008). In our sample, there was an emphasis on Internet websites – and not mobile apps – for actively seeking out UAI (websites focusing on ‘barebacking’). This is an area of research that needs to be addressed in future studies as a very high-risk activity; many of the men in our sample most likely understand the risks of UAI to some degree given their highest obtained educational level, but they still decide to seek this type of activity. Future research on interventions can focus on ways to reduce risk among people who understand the risks of UAI but decide to pursue it for other reasons. Health education, including sexual health education,
should be delivered at all points of service – in health care settings, community clinics, and via innovative technologies such as smartphone applications.

Conclusions and relevance to practice

Men who have sex with men remain at high-risk for syphilis infection, yet there remain gaps in knowledge regarding the various risk behaviours associated with infection. Early detection and treatment is critical to reducing syphilis transmission and negative outcomes of long-term infection. In addition, frequent testing is essential for individuals at risk of infection and after adequate treatment. Future research is needed using newer approaches, including ones that study the use of technology such as Internet sex and partner seeking, and GPS sex-seeking and social dating smartphone applications (e.g. Grindr and Gaydar). If similar interrelated sexual networks have high levels of similarity among participants’ high-risk behaviours, contact tracing may be used to identify relevant risk-reduction interventions before they become necessary to individual participants.

Contributions

Study design: MS, RD; Data collection and analysis: RD; Manuscript preparation: RD, MS, JB.

References

AHC Media (2003) The Internet’s role as modern bathhouse is being scrubbed. AIDS Alert 18, 121–132.


Downing M (2012) Using the Internet in pursuit of public sexual encounters is frequency of use associated with risk
behavior among MSM? American Journal of Men’s Health 6, 18–27.


