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Situational predictors of sexual risk episodes among men with HIV who have sex with men

P A Wilson, S Cook, J McGaskey, M Rowe, and N Dennis

Department of Sociomedical Sciences, Mailman School of Public Health, Columbia University, New York, USA

Abstract

Background—Men with HIV who have sex with men (MSM) represent the largest group of people living with HIV/AIDS in the United States. It is important to understand the sexual risk-taking behaviours that may be linked to the transmission of HIV and other sexually transmitted infections in this population. Models of HIV risk that focus solely on personal factors have been demonstrated to be ineffective at explaining risk behaviour. Rather, in order to fully understand sexual risk-taking, it is important to examine the factors linked to high-risk sexual situations and not solely the factors linked to potentially high-risk people.

Methods—A diverse sample of 100 MSM with HIV completed a 6-week internet-based sex diary that collected detailed information on recent sexual encounters. In total, information on over 250 sexual episodes was collected and analysed. Generalised linear mixed models were used to examine situational predictors of risk episodes.

Results—Analyses revealed that drug use by self and sex partners (examined individually and together) were positively related to risk episodes. Likewise, having a sex partner met online and having a sexual encounter in a sex party or bathhouse setting was linked to risk episodes. Sexual episodes that involved a sex-partner who was perceived as sexually desirable and those involving communication about HIV and/or condom use with partners each were negatively related to risk.

Conclusions—Situational factors play an important role in explaining sexual risk-taking among MSM with HIV. Researchers should place a greater focus on drug use and characteristics of sex partners and settings in which sexual behaviours occur as situational predictors of risk in order to comprehensively understand sexual risk-taking in this population.

Models of HIV risk behaviour that focus solely on personal factors have been demonstrated to be ineffective at explaining risk.¹ In order to fully understand sexual risk-taking, it is important that researchers examine the factors linked to high-risk sexual situations and not solely the factors linked to potentially high-risk people. It is thus critical to employ the situation level of analysis in exploring the factors that promote high-risk sex among men with HIV who have sex with men (MSM) who represent the largest group of people living with HIV/AIDS in the United States.²

Correspondence to: Patrick A Wilson, Columbia University, Mailman School of Public Health, Department of Sociomedical Sciences, 722 West 168th Street, 5th Floor, New York, NY 10032, USA; pw2219@columbia.edu.

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Drug use has been shown to be associated with high-risk sex among MSM with HIV.^{3,4} However, most studies aimed at exploring the relationship between substance use and sexual risk-taking have done so at the person level of analysis, which does not allow for causal inference.⁵ This exploratory study conceptualised drug use as a characteristic of the sexual situation. Likewise, the study examined other key variables posited to fluctuate during sexual episodes, including characteristics of sex partners, feelings directed toward sex partners and characteristics of sexual encounters.

METHODS

A convenience sample of 100 men with HIV who reported engaging in same-sex sexual behaviour in the past month participated in the study. Participants were primarily recruited from clinics and community-based organisations (48%) through study participant referrals (39%) and through adverts placed in local media (13%). Participants ranged in age from 20–61 years (mean = 43). The sample comprised black (53%), Latino (25%) and white (22%) men with 71% reporting an income of $\leq \\$20\,000$ per year. Most (80%) reported having sex with more than one partner on a consistent basis and 79% indicated using drugs in the past 2 months.

Participants completed a 6-week internet-based structured sex diary. Men completed the sex diary online on a weekly basis. The sex diary asked participants about substance use and sexual behaviours occurring in the past week. Those who reported engaging in sexual activity were asked to provide details of their most recent sexual encounter using brief, predominantly yes/no questions. There was an 88% response rate across the 6 weeks of the sex diary (completion rates for individual weeks ranged from 91–85%). A total of 275 sexual episodes were reported by the participants. Due to a website technical error, there was missing outcome data (that is, on sexual behaviour variables) in 17 episodes; thus, 258 sexual episodes were examined in the analysis. Eight participants did not report engaging in sexual behaviour over the 6-week period; these participants and those that were sexually active did not differ from one another on demographical variables. Excluding non-sexually active participants, an average of three sexual episodes was reported by each participant over the 6-week period. Each episode was categorised according to whether unprotected anal intercourse (UAI) with a non-monogamous sex partner occurred during the encounter ($n = 124$; reported by 61% of participants). Episodes involving UAI with a partner without HIV or of unknown status ($n = 37$; reported by 26% of participants) were examined separately.

Generalised linear mixed models (GLMMs) were used to examine the univariate and multivariate relationships between situational factors and UAI episodes. Only situational factors observed to be statistically significant ($p < 0.05$) were included in multivariate analyses. GLMMs treat the episode as the unit of analysis and allow for the prediction of dichotomous outcome variables using a log-link function, all while extracting between-person variance as random effects.⁶ By controlling for person-level effects, GLMMs allow for the identification of situation-level relationships.

RESULTS

Results from the GLMMs are presented in table 1. When participants reported drug use by self, sex partners or both, they were two to three times more likely to have an episode involving UAI compared with when drug use was not reported. Episodes involving a sex partner that participants met online were four and three times more likely to involve UAI and UAI with a serodiscordant or unknown status partner, respectively. Feelings of strong sexual attraction toward a partner were inversely related to serodiscordant UAI episodes.

Conversely, episodes that took place in a sex club or bathhouse were six times more likely to involve UAI with a serodiscordant or unknown status partner. Lastly, discussions about HIV and/or condom use with sex partners were found to be protective against UAI. In multivariate models, two of the five situational factors linked to UAI (that is, met partner online, discussions about condom use) were shown to be independently related to UAI episodes. Each of the three situational factors related to UAI with serodiscordant or unknown status partner were found to be independent predictors in multivariate models.

DISCUSSION

This exploratory study is among the first to examine situational predictors of unprotected sex in a diverse sample of MSM with HIV. The study supports the idea that drug use behaviour, by both men and their sex partners, is a significant predictor of risk episodes and may be a key factor in the development of interventions targeting MSM with HIV. Although use of specific drugs during sexual encounters was not examined here, previous situation-level studies of MSM have observed relationships between use of amyl nitrite and methamphetamine during sex and risk behaviour.^{7, 8} Also, the findings suggest that the internet and bathhouse/sex club settings may represent potentially risky milieus that contribute to risk behaviour, which may result in the transmission of HIV to uninfected sex partners. Although previous person-level studies have suggested increased risk behaviour among men who meet sex partners via the internet⁹ and in bathhouses¹⁰, none have examined these variables at the situation level of analysis nor have studies examined the effects of these predictors on risk net of each other. Lastly, a notable finding that emerged was that when participants indicated that experiencing strong sexual attraction towards their partner they were less likely to engage in serodiscordant UAI episodes. Sexual desirability may be linked to perceptions of health and HIV status, and men in the sample may have been less likely to engage in protective behaviours in situations in which they assumed their partner had HIV based on their physical appearance. Research is needed to better understand this finding.

This study is limited by the relatively small sample size obtained through convenience methods and the findings obtained may not be generalisable to all MSM with HIV. More research is needed to obtain information on sexual encounters in a representative sample of MSM with HIV. In spite of the limitations, this research represents an important first step in obtaining a more comprehensive understanding of risk situations among MSM with HIV.

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Key messages

- To comprehensively understand sexual risk-taking among men with HIV who have sex with men (MSM), it is important to examine the factors linked to high-risk sexual situations.
- A greater focus is needed on drug use (by both men and their sex partners) and characteristics of sex partners and settings in which sexual behaviours occur as situational predictors of risk.
- Meeting partners online and engaging in sexual behaviour in bathhouse or sex party settings may be the strongest situational predictors of unprotected anal intercourse with serodiscordant or unknown status partners among MSM with HIV.

Table 1

Findings from generalised linear mixed models (GLMMs)[‡] predicting unprotected anal intercourse (UAI) episodes using situational predictor variables

Situational variables	UAI episodes (n = 258), n (%)			UAI episodes with serodiscordant or unknown status partners (n = 37)		
	All episodes (n = 258), n (%)	n (%)	OR (95% CI)	n (%)	OR (95% CI)	
Drug use						
Drug use by self	127 (49%)	76 (61%)	2.3 (1.1 to 4.7)*	19 (51%)	1.4 (0.6 to 3.4)	
Drug use by partner [‡]	112 (54%)	66 (66%)	2.8 (1.3 to 6.4)**	13 (50%)	1.1 (0.4 to 2.9)	
Drug use by self and partner [‡]	102 (41%)	61 (52%)	2.4 (1.1 to 5.1)*	11 (33%)	0.9 (0.4 to 2.4)	
Partner characteristics						
Met partner online	72 (28%)	50 (40%)	4.3 (1.8 to 10.4)**	18 (49%)	2.9 (1.2 to 7.5)*	
Partner represented physical ideal	168 (65%)	74 (60%)	0.8 (0.4 to 1.7)	19 (51%)	0.6 (0.2 to 1.4)	
Feelings about partner						
Strong emotional attraction	164 (64%)	71 (57%)	0.7 (0.3 to 1.4)	18 (49%)	0.8 (0.3 to 1.8)	
Strong sexual attraction	230 (89%)	107 (86%)	0.8 (0.3 to 2.2)	27 (73%)	0.3 (0.1 to 0.9)*	
Sexual encounter characteristics						
Discussions about HIV/condom use	172 (67%)	68 (55%)	0.4 (0.2 to 0.8)**	18 (49%)	0.5 (0.2 to 1.2)	
Multiple sex partners	38 (15%)	25 (20%)	2.2 (0.8 to 5.8)	5 (14%)	0.9 (0.3 to 2.9)	
Sex party or bathhouse setting	15 (6%)	8 (7%)	1.6 (0.4 to 7.0)	6 (16%)	6.3 (1.0 to 26.9)**	

* p 0.05;

** p 0.01, **BOLD** indicates situational predictor variable was significant (p 0.05) in multivariate model;

[‡] all analyses were adjusted for participants' age and race. Analyses examining drug use situational predictor variables were adjusted for participants' drug use behaviours at baseline;

[‡] excludes episodes in which participants indicated not knowing if their partner used drugs before or during the episode.