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# Determinants of Sexual Risk-Taking Among Young HIV-Negative Gay and Bisexual Men

*†Steffanie A. Strathdee, *†Robert S. Hogg, *Stephen L. Martindale, *Peter G. A. Cornelisse, *Kevin J. P. Craib, *‡§Julio S. G. Montaner, *‡‖Michael V. O'Shaughnessy, and *†‡Martin T. Schechter

**British Columbia Centre for Excellence in HIV/AIDS, St. Paul's Hospital; †Department of Health Care and Epidemiology, University of British Columbia; ‡St. Paul's Hospital; §Department of Medicine, University of British Columbia; and ‖Department of Pathology, University of British Columbia, Vancouver, British Columbia, Canada*

**Summary:** Data from a cohort of young HIV-negative gay and bisexual men were analyzed to identify determinants of sexual risk-taking at baseline. Gay/bisexual men aged between 18 and 30 completed a self-administered questionnaire including demographics, depression, social support, substance use, and consensual versus nonconsensual sex. Risk-takers were defined as those who had unprotected anal sex with casual male sex partners in the previous year; non–risk-takers were defined as those who reported consistent condom use during anal sex with all male partners in the previous year. Logistic regression was used to identify independent predictors of sexual risk-taking. Of 439 men studied, risk-takers had less education, a higher depression score, less social support, and were more likely to report nonconsensual sex and recreational drug use relative to non–risk-takers. Independent predictors of sexual risk-taking were low education, nitrite use, low social support (adjusted odds ratio [AOR] = 1.65; 95% CI, 1.04–2.59), and nonconsensual sex experienced as a youth or adult (AOR = 1.85; 95% CI, 1.15–2.96). Young gay/bisexual men reporting nonconsensual sex, low social support, or nitrite use were significantly more likely to have recently had unprotected anal sex with casual partners. HIV prevention programs aimed at young gay/bisexual men should include sexual abuse counselling and foster community norms supporting safer sex practices. **Key Words:** HIV—Risk behaviors—Gay men—Social support—Sexual abuse.

Concern is growing about HIV incidence rates among young homosexual men (1,2). Reports of a declining trend in AIDS incidence among homosexual men in the United States since the epidemic began do not apply to younger birth cohorts and do not reflect HIV incidence at present (2). Studies indicate that between 25% and 50% of gay men between the ages of 18 and 30 have engaged in unprotected anal sex within the previous year (3–9) often without knowledge of their partner's serostatus (9,10). This suggests that despite a decade of HIV/AIDS prevention efforts, young gay men continue to place themselves in situations on which they are at high risk of infection.

Studies have suggested that gay men engaging in unprotected anal sex tend to be younger (11–13) and are more likely to report recreational drug use, often in conjunction with sex (6,9,12–15). Inconsistent findings have been reported with respect to the role of alcohol as a predisposing factor (3,14–18). Some research has shown that psychological factors, such as depression (3,15,19) and low social support (11,20,21) predispose to sexual risk-taking among gay men. However, only a few of these findings have been confirmed among young gay/

Address correspondence and reprint requests to Robert Hogg, British Columbia Centre for Excellence in HIV/AIDS, 608-1081 Burrard Street, Vancouver, British Columbia, Canada V6Z 1Y6; email: steff@hivnet.ubc.ca.

Steffanie A. Strathdee is currently affiliated with the Infectious Disease Program, Johns Hopkins University, Department of Epidemiology, School of Hygiene and Public Health, Baltimore, Maryland, U.S.A.

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bisexual men (3,15). The latter observation is important in that reasons for sexual risk-taking appear to differ for older versus younger gay men (4).

Social determinants are particularly important because they may represent avenues for prevention that are amenable to change. We hypothesized that young gay/bisexual men reporting more social problems, such as unstable housing, depression, less social support, or a history of sexual abuse may be less able to negotiate safer sex practices, thereby increasing their vulnerability to HIV and other sexually transmitted diseases. We aimed to determine whether these factors were independent predictors of high-risk sexual behavior in a cohort of young gay/bisexual men from Vancouver at baseline.

## METHODS

### Study Subjects

Gay and bisexual men aged 18 to 30 years who were living in the Greater Vancouver region were recruited through physicians' offices, clinics, and outreach for a prospective study of HIV incidence and risk behaviors beginning in May, 1995. Men were eligible to participate if they had not previously tested HIV-seropositive and if they self-identified as gay/bisexual or had sex with other men. Participants complete a confidential self-administered questionnaire and undergo an HIV test on an annual basis. Specimens that were HIV reactive on enzyme-lined immunosorbent assay (ELISA) were confirmed by Western blot at the provincial laboratory of the British Columbia Centre for Disease Control, British Columbia Ministry of Health.

### Study Instrument

The baseline questionnaire requested information on demographics, sexual behaviors with men and women, and substance use. Questions on sexual activity were prefaced by a definition of sex as "oral, anal or vaginal intercourse." Sexual behaviors were classified as either consensual (defined as "sex you engaged in willingly"), nonconsensual ("sex you were forced or coerced into, including rape, sexual assault, or childhood sexual abuse"), or paid sex ("exchange of sex for money, goods, or drugs").

Data were collected on total numbers of male and female sexual partners in the previous year and lifetime, the age at which respondents first willingly had sex, and frequencies of specific consensual sexual practices over the past year (e.g., insertive versus receptive anal intercourse, with and without ejaculation). Sexual behaviors were recorded for regular partners, defined as men with whom respondents had sex more than once a month on average, and casual male partners, less than once a month on average. Respondents were also asked to indicate the frequency of condom use during these encounters, reasons for inconsistent condom use, and whether or not they had unprotected insertive or receptive anal intercourse with a male they knew at the time was HIV-positive. Respondents were asked whether they had ever experienced nonconsensual sex, as already defined. Those answering in the affirmative were asked to indicate whether the experience occurred at <12 years of age, between 12 and 17 years of age, or at >18 years of age and their relationship to the perpetrator or perpetrators.

Respondents indicated their frequency of use of each of the following substances within the last year: alcohol, cigarettes, marijuana/hashish, lysergic acid diethylamide (LSD), cocaine and crack, heroin, methamphetamines (speed), amyl/butyl nitrite inhalants, or other drugs. They were also asked whether they had injected drugs within the last year or used a needle someone else had already used. Finally, the questionnaire included the Instrumental-Expressive Social Support Scale (IES), which asked respondents to indicate the frequency with which they experienced a list of 26 problems (e.g., "not having a close companion") (22), and an abbreviated seven-item version of the Center for Epidemiologic Studies Depression scale (CES-D), which has been previously validated (23).

### Statistical Analysis

For the purpose of this analysis, we defined risk-takers as men who reported at least one episode of unprotected anal sex with a casual male partner in the previous year, or who had unprotected anal sex with someone they knew at the time was HIV-positive. Non–risk-takers were defined as men who reported always using condoms during anal sex with all male sex partners in the previous year, or reported not engaging in anal sex. To avoid potential misclassification in these extreme groups, we excluded men who engaged in unprotected anal sex only with regular partners from the analysis. Similarly, we excluded ten men who tested HIV-positive at baseline, because subjects who suspected themselves to be HIV-infected may have altered their behavior prior to recruitment into the study.

Unstable housing was defined as living in a hotel, boarding house, group home, or in the street at the time of enrollment. Frequencies for the IES and CES-D scales were independently scored (e.g., never = 1, always = 5) and summed; scores above the 75th percentile were considered as either a low social support or high depression score, respectively.

Comparisons between risk-takers and non–risk-takers were carried out with respect to individual social, demographic, and behavioral variables using Mantel-Haenszel methods. Unadjusted relative risk estimates were calculated using the sample odds ratio, and test-based 95% CI were calculated. Stepwise logistic regression analysis was used to assess the independent effect of these variables on sexual risk-taking. All variables that were significant at the 5% level in univariate analyses were considered for inclusion in the final multivariate model. In addition, all two-factor interactions were assessed for their effect on the outcome. All reported $p$ values are two-sided.

## RESULTS

Of 473 men who were eligible for this analysis as of October, 1997, we excluded 34 for whom data on sexual partnerships or condom use was not provided. The latter group did not differ from those who were included in terms of age, ethnicity or other characteristics ($p > .05$). Of the 439 men included in the analysis, 177 (40%) were classified as risk-takers and 262 (60%) as non–risk-takers according to the criteria given. Four men who reported having unprotected anal sex only in situations of condom failure were considered non–risk-takers.

A summary of sociodemographic characteristics is reported in Table 1 for risk-takers, non–risk-takers, and overall. Median age was 26 years. Most participants were white (71%), had completed high school (84%), and reported stable housing at baseline (92%). There were no differences between risk-takers and non–risk-

**TABLE 1.** *Comparison of young gay/bisexual men categorized as nonrisk-takers (n = 262) vs. risk-takers (n = 177) in Vancouver*[a]

| Variable | Non–risk-takers *n* (%) | Risk-takers *n* (%) | Total *n* (%) | Odds ratio (95% CI) |
|---|---|---|---|---|
| Sociodemographics | | | | |
| Median age years (interquartile range) | 26 (23–28) | 26 (23–28) | 26 (23–28) | 0.73 (0.42–1.28)[c] |
| Nonwhite ethnicity | 77 (29) | 52 (29) | 129 (29) | 1.00 (0.66–1.52) |
| Unstable housing[b] | 21 (8) | 14 (8) | 35 (8) | 1.00 (0.49–2.04) |
| Education < high school | 32 (12) | 35 (20) | 67 (16) | 1.76 (1.04–2.96) |
| Low social support score[b] | 55 (21) | 63 (36) | 118 (27) | 2.08 (1.36–3.18) |
| High depression score[b] | 61 (23) | 57 (32) | 118 (27) | 1.56 (1.02–2.39) |
| Sexual experience | | | | |
| Been paid for sex[b] | 29 (11) | 33 (19) | 62 (14) | 1.84 (1.08–3.15) |
| Nonconsensual sex[d] | | | | |
| Ever | 78 (30) | 67 (39) | 145 (34) | 1.48 (0.99–2.23) |
| <12 years of age | 42 (16) | 30 (17) | 72 (16) | 1.07 (0.64–1.79) |
| 12–17 years of age | 24 (9) | 35 (20) | 59 (13) | 2.44 (1.41–4.23) |
| >18 years of age | 30 (11) | 34 (19) | 64 (14) | 1.84 (1.08–3.12) |
| Recreational drug use | | | | |
| Smoked cigarettes | 157 (60) | 124 (70) | 281 (64) | 1.56 (1.04–2.35) |
| Used cocaine/crack | 78 (30) | 67 (38) | 145 (33) | 1.44 (0.96–2.15) |
| Used nitrite inhalants | 67 (26) | 77 (45) | 144 (33) | 2.30 (1.53–3.45) |
| Injected drugs | 14 (5) | 14 (8) | 28 (6) | 1.54 (0.72–3.30) |
| Alcohol (⩾10 drinks/week) | 52 (20) | 48 (27) | 100 (23) | 1.50 (0.96–2.35) |

[a] Based on $\chi^2$ tests.
[b] Based on previous year.
[c] Per 10-year increase.
[d] Categories are not mutually exclusive.
OR, odds ratio; CI, confidence interval.

takers with respect to age, ethnicity, or housing conditions ($p > .05$). However, risk-takers were significantly more likely to have a lower social support score ($p = .001$), a higher depression score ($p = .04$), and were less likely to have completed high school ($p = .03$).

Relative to non–risk-takers, men reporting sexual risk-taking were more likely than to report having used all of the recreational drugs studied, including nitrite inhalants and cocaine. Because of the small number reporting crack use within the last year (5%), these data were collapsed with cocaine use. Risk-takers were also more likely to report smoking cigarettes, and having >10 alcoholic drinks per week (i.e., 75th percentile).

One third of respondents reported nonconsensual sex at some point in their lives, an experience that was more common among risk-takers (39% versus 30%). In particular, risk-takers were significantly more likely to report experiencing nonconsensual sex in adolescence (i.e., 12–17 years) or adulthood (i.e., >18 years of age). Differences were noted in the nature of the relationship between the respondent and the perpetrator, depending on the victim's age. Among men reporting nonconsensual sex as a child, 90% identified the perpetrator as a male relative or family friend. Those who reported nonconsensual sex as a youth most commonly reported that the perpetrator was a male stranger (30%) or family friend (19%), and those >18 years of age at the time most commonly cited a male date or boyfriend (44%) or a male stranger (34%).

Several factors remained independently associated with sexual risk-taking in the final multivariate model (Table 2). Respondents who reported less than a high school education or who used nitrite inhalants in the previous year were significantly more likely to be risk-takers. A significant interaction was observed between education and nitrite use (adjusted odds ratio [AOR] = 0.31; 95% CI, 0.1–0.98). Among subjects with more than a high school education, risk-takers were significantly more likely to use nitrites than non–risk-takers, although no corresponding difference among men with less education was found. Even after controlling for these factors, however, respondents who had less social support (AOR = 1.65; 95% CI, 1.04–2.59), or those who experienced nonconsensual sex as a youth or adult (AOR = 1.85; 95% CI, 1.15–2.96) were significantly more likely to report sexual risk-taking. Results were essentially unchanged after controlling for age, ethnicity, and involvement in the sex trade.

Given the findings regarding nonconsensual sex, we conducted a subanalysis to compare behaviors of young gay men who had ever experienced nonconsensual sex to those who had not. The former were significantly more likely to report having been paid for sex in the previous year (OR = 2.02; 95% CI, 1.17–3.48), and reported first having consensual sex with men, and doing so on a regu-

**TABLE 2.** *Final multivariate logistic model identifying independent predictors of sexual risk-taking among 439 young HIV-negative gay/bisexual mean in Vancouver*[a]

| Variable | β Coefficient | Standard error | Adjusted odds ratio | 95% CI |
|---|---|---|---|---|
| Nonconsensual sex over age 12 years | 0.61 | 0.24 | 1.85 | (1.15–2.96) |
| Low social support score[a] | 0.50 | 0.23 | 1.65 | (1.04–2.59) |
| Used nitrite inhalants[b] | 0.88 | 0.23 | 2.40 | (1.52–3.81) |
| Education < high school | 0.87 | 0.34 | 2.40 | (1.23–4.61) |
| Interaction: nitrite used × education | −1.16 | 0.58 | 0.31 | (0.10–0.98) |

[a] Based on previous year.

[b] Among subjects with more than high school education, risk-takers were significantly more likely to use nitrites than non-risk-takers; no corresponding difference existed among men with less education.

CI, confidence interval.

lar basis, at an earlier age (OR = 1.16; 95% CI, 1.08–1.23). These men also had a higher depression score (OR = 2.08; 95% CI, 1.34–3.22), lower social support (OR = 1.94; 95% CI, 1.24–3.00), and were significantly more likely to report the use of several recreational drugs in the previous year.

## DISCUSSION

In our study of young HIV-negative gay and bisexual men, 40% of subjects willingly had unprotected anal intercourse with a casual male sex partner in the previous year. This high level of unprotected anal sex is consistent with other studies (1,4–7), which underscores the need for intensive prevention programs targeted toward young gay/bisexual men. The underlying factors responsible for this high-risk sexual behavior are of critical importance to tailor these programs more effectively.

In a previous analysis that focused on older gay men enrolled in the Vancouver Lymphadenopathy AIDS Study (12), lower income and substance use, most notably the use of nitrite inhalants (''poppers'') were significantly associated with sexual risk-taking. Other studies of older (13,14,24) and younger homosexual men (6) have reported a similar relation between nitrite inhalants and unprotected anal sex. The present analysis confirms this relation for younger gay/bisexual men, which is a concern because poppers appear to be regaining popularity. It is of particular concern that we observed nitrite use to be more common among risk-takers who had higher levels of education. As with other researchers (3, 17,18), we failed to find a significant effect associated with alcohol use after controlling for other factors. However, the present analysis was limited by the lack of standard scales to measure alcohol dependency and situational substance abuse.

Of greater interest in this study was the relation between social determinants and sexual risk-taking. Risk-takers were more likely to be depressed, had less social support, and were more likely to report having experienced nonconsensual sex relative to non–risk-takers. In our multivariate analysis, young gay/bisexual men who reported experiencing nonconsensual sex as a youth or adult were almost twice as likely to have recently engaged in unprotected anal sex with a casual male partner. This association persisted after adjusting for involvement in the sex trade, substance use, and other factors.

A growing body of literature suggests that past sexual abuse may contribute to increased vulnerability to HIV and other sexually transmitted diseases (6,25–34). Common long-term sequelae of sexual abuse are depression, sexual compulsivity, substance abuse, and prostitution (26,35). These factors can all be directly or indirectly linked to the risk of HIV transmission and were supported by the results of our subanalysis. Studies focusing on gay men have observed that those who report forced or coerced sex during childhood or adolescence subsequently report first willingly having sex with men at a younger age (30), are more likely to be paid for sex (25,30), and more frequently report use of recreational drugs (30). In several studies, gay men who reported nonconsensual sex were significantly more likely to report recent unprotected anal sex with male sexual partners (6,29–32). Some of these studies have also found a significant correlation between unprotected anal sex and low education (29,31) or use of nitrite inhalants (6), after adjusting for past sexual abuse.

Unlike many studies that primarily focused on sexual abuse occurring in childhood or adolescence, we also asked respondents whether or not they had experienced nonconsensual sex in adulthood. Among the men in our study who reported ever experiencing nonconsensual sex, a considerable proportion reported at least one occurrence at >18 years of age. The most common perpetrator in these cases was a male date or boyfriend. In a study by Hickson (27), 25% of 212 gay men who reported having been forced into a sexual act listed the perpetrator as a casual male partner, or a regular male partner in an ad-

ditional 5% of cases. In this study, anal penetration was significantly more common when prior consent had been given for some other sexual act (27). Because our data clearly indicate that nonconsensual sex can occur within the context of gay male relationships, as has been shown for heterosexuals (36), the relationship between sexual victimization and the ability to negotiate safer sex in subsequent relationships requires further study.

In addition, the potential for HIV transmission as a direct consequence of a nonconsensual sex act should not be overlooked. Receptive anal intercourse, which is considered to pose the greatest risk of HIV transmission, appears to be the most common mode of sexual assault among males (27,37). Although HIV transmission as a direct consequence of sexual assault has been rarely reported (38), these situations require appropriate HIV testing, counseling, and support beyond immediate crisis intervention.

Our analysis also found an independent association between low social support and sexual risk-taking. Previous studies have reported similar findings among older gay men (10,20,21). In a prospective study of behavior change among gay men, Catania et al. (21) found that increasing levels of informal support strongly predicted condom use the following year. More recently, a controlled study that included both formal and informal supports in a community-level program aimed at young gay men demonstrated significant reductions in high-risk behaviors (39). These data and our own support the notion that supportive networks that influence community norms around safer sex may have a direct impact on future HIV incidence rates among young gay and bisexual men. An understanding of the mechanisms by which substance use acts as a barrier to HIV prevention is needed to promote and sustain salutary behavior change (16,40).

Several limitations of our study should be acknowledged. We may have failed to observe significant associations between some factors, such as nonwhite ethnicity, unstable housing, or injection drug use, as a result of limited statistical power. Because our study restricts eligibility to a narrow age range (i.e., respondents between ages 18 and 30) and because we enrolled smaller numbers of younger men, this may account for the reason why we did not observe a significant effect of younger age on the likelihood of risk-taking. Generalizability of our findings may also be limited. We excluded men who engaged in unprotected anal sex only with regular partners to reduce the potential for misclassification, which could have arisen as a consequence of negotiated safety (41). Another limitation is inconsistency among definitions of sexual abuse, which has been noted by others (35,42). Previous studies have classified experiences according to the age difference between the victim and the perpetrator or the degree of physical force (29–31). As is the case with others (6,25,27), we relied on the perception of the respondent to decide whether or not the experience was coercive or physically forced. This may have led to some underreporting and it is possible that the reporting might be differential between risk-takers and non–risk-takers. Despite different definitions, the prevalence of nonconsensual sex among gay men ranges from 27% to 40%, irrespective of age (6,25,27,30,34). Although we observed a stronger relation between sexual risk-taking and nonconsensual sex for episodes occurring during adolescence or adulthood, our results should not be used to trivialize the impact of childhood sexual abuse. We could not differentiate between situations in which people who were abused as children were revictimized as adults, which is commonly reported (27,35). We therefore cannot rule out the possibility that a subgroup of individuals who were abused at different points in their lives by one or more perpetrators were subsequently more likely to be sexual risk-takers.

The results from the present study suggest new avenues for identifying and targeting prevention for young gay and bisexual men who remain at high risk of HIV infection. Our cross-sectional analysis cannot determine whether or not sexual abuse is a causal factor or a correlate of sexual risk-taking. Nevertheless, our results and those of others suggest that young gay and bisexual men with a history of sexual abuse should be targeted by HIV prevention programs. Zierler et al. (25) have suggested that some safer sex messages may be inappropriate for persons whose lives have been complicated by sexual victimization. Young gay/bisexual men with a history of sexual abuse may be less able to negotiate safer sex or may be less comfortable with their sexual identity (30), thus signaling a need for enhanced education and support. Our results indicate that low social support is also an independent predictor of sexual risk-taking among young gay/bisexual men. Such findings may be interpreted as facets of a complex dynamic which contribute to ''HIV vulnerability'' (42). The situational, social, political, and economic factors that create a climate for such vulnerability pose the ultimate challenge in HIV prevention.

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