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ABSTRACT

The objective of this study is to determine whether there are sociodemographic markers which distinguish seronegative men who continue to place themselves at risk through unprotected anal intercourse with casual sex partners from those seronegative men who do not participate in this practice. Eligible subjects were identified in large urban cohort of homosexual men as those who were HIV negative and who completed an index visit between October 1989 and September 1990 and reported having sexual contact with casual partners during the previous 12 month period. Risk takers were those who reported having unprotected anal receptive or insertive intercourse with casual partners; while the remaining subjects (controls) were those who reported either not engaging in anal intercourse with casual partners or using condoms at all times when they did. Nonparametric methods were used to compare sociodemographic variables between the risk takers and the controls. A total of 139 seronegative men were eligible. Of these, 31 subjects were included in the risk taking group and 108 in the control group. Risk takers were significantly younger (median age of 35 versus 40 years; p=0.013) and were more likely to have incomes below $10,000 (37 versus 12 per cent; p=0.002), to smoke cigarettes (58 versus 35 per cent; p=0.022), and to use nitrite inhalants (55 versus 30 per cent; p=0.010) than controls. These results indicate that there are number sociodemographic variables that characterize seronegative men who continue to place themselves at risk through unprotected anal intercourse with casual sex partners. Overall our findings suggest the importance of targeting AIDS prevention activities to younger gay men, to those of lower socioeconomic status, and to those exhibiting other risk behaviour such as smoking and use of nitrite inhalants.

INTRODUCTION

Anal intercourse without a condom is the principal mode of HIV transmission among homosexual men [1, 2, 3, 4, 5]. Several prospective studies have shown that since the promotion of 'safer sex practices', the self-reporting of unprotected anal intercourse by gay men has declined between 50 and 90 per cent in several settings [6]. Most recently, however, studies have shown that the decline in the frequency of unprotected anal intercourse may not be uniform throughout this population [7]. In particular, there are some men who have had relapses in risky sexual behaviour, especially those in long-term or monogamous relationships [8], and other men who have not modified their behaviour at all.

With conservative estimates in the range of 2 per cent for the prevalence of men who have sex with men [9], there are likely several million such men in North America. Any increase in the seroconversion rate in this group, even a small one, could represent tens of thousands of new cases of HIV infection. The purpose of this study is to determine whether there are sociodemographic markers which distinguish seronegative men who continue to place themselves at risk through unprotected anal intercourse with casual sex partners from those seronegative men who do not participate in this practice.

METHODS

The methods and aims of the Vancouver Lymphadenopathy-AIDS Study (VLAS) have been described in detail elsewhere [10, 11]. Briefly, the VLAS is an ongoing prospective study of 1,000 homosexual men who were enrolled during two recruitment periods. From November 1982 to December 1984, a total of 729 men

were recruited through six general practices in central Vancouver. An additional two practices were added and 271 men were enrolled during the period from October 1986 to December 1987. Follow-up visits occurred approximately every six months until September 1986 after which subjects completed visits on an annual basis. During each visit subjects completed a self-administered questionnaire which elicited information on age, income, educational and occupational status, sexual partners and practices, use of alcohol, tobacco, and illicit drugs, and how AIDS had changed gay society. Subjects were also counseled by their physicians on how to adopt safer sex practices including reducing the number of sexual partners and avoiding unprotected sexual intercourse.

Eligible men for this study were those who were HIV negative, who completed an index visit between October 1989 and September 1990, and who reported sexual contact with casual partners (less than one sexual encounter per month) during the previous 12 month period. Risk takers in this group were identified as those who had reported unprotected anal receptive or insertive intercourse with casual partners; while controls (the remaining subjects in the group) were identified as either those who did not engage in anal intercourse with casual partners or who reported using condoms at all times when they did.

Patterns of sexual behaviour were measured using the questionnaire items pertaining to the number of different sexual partners in the previous 12 months, the frequency of various sexual practices during this period, and condom use during these practices. In addition, information on lifestyle was assessed using questions pertaining to the use of alcohol, tobacco, and illicit drugs.

Statistical analyses of the data were conducted using distribution-free methods. Comparisons of risk takers and control subjects with respect to categorical variables were based on Pearson's chi-square statistic. Fisher's exact test was used when sample sizes were small. Continuous variables were analyzed using the Wilcoxon rank-sum test for independent samples. All reported p-values are two-sided.

RESULTS

A total of 139 seronegative men who completed the index visit and reported sexual contact with casual partners were included in this analysis. Of these, 31 subjects (22 per cent) were risk takers and 108 subjects (78 per cent) were controls. The control group was made up of 72 subjects (67 per cent) who did not engage in anal intercourse with casual partners and 36 subjects (33 per cent) who reported always using condoms during anal intercourse with casual partners.

Although risk takers tended to report higher numbers of casual partners than controls, the observed difference was not statistically significant. The median number of casual partners was ten for risk takers compared to five for controls (p=0.976). Risk takers and controls were similar with respect to their reported frequency of sexual contact in bath houses (p=0.278), bars/discos (p=0.696), and public washrooms or parks (p=0.976).

Table 1 compares risk takers and controls with respect to age, annual income, and education. As shown here risk takers were younger (median age of 35 versus 40 years; p=0.013) and more likely to have incomes below $10,000 (37 versus 12 per cent; p=0.002) than controls. A higher proportion of risk takers also did not complete a

university degree (68 versus 51 per cent; p=0.107). However, this difference was not statistically significant.

Table 2 compares risk takers and controls with respect to consumption of alcohol and cigarette smoking. Risk takers were significantly more likely to be heavy drinkers of alcoholic beverages, as defined as more than 60 drinks per month (16 versus 6 per cent; p=0.067), and to smoke cigarettes (58 versus 35 per cent; p=0.022).

Table 3 compares risk takers and controls with respect to uses of nitrate inhalants and other illicit drugs. As noted here a higher percentage of risk takers reported using nitrite inhalants during the previous year (55 versus 30 per cent; p=0.010). However, no differences were observed for the use of amphetamine, cocaine, lysergic acid diethylamide (LSD), marijuana, and methylene-dioxy-amphetamine (MDA).

Table 4 compares risk takers and controls with respect to opinion regarding changes in gay society brought on by the AIDS epidemic. All subjects reported that they felt AIDS had significantly changed gay society. However, risk takers were more likely to report that these changes were "more bad than good" (39 versus 20 per cent); while control subjects were more likely to report that these changes were "more good than bad" (62 versus 50 per cent).

DISCUSSION

This present study has identified, in a large cohort of homosexual men, several sociodemographic characteristics of a HIV negative subgroup who continue to place themselves at high risk of HIV infection through their sexual behaviour. In

comparison to controls, risk takers were identified as men who were younger, had lower incomes, and were more likely to smoke cigarettes and use nitrite inhalants on a regular basis.

Our results demonstrate that risk takers are part of a subgroup of young and economically disadvantaged homosexual men. This is not surprising considering that other behavioural studies have identified younger homosexual men and homosexual men of lower socioeconomic status to be less receptive to AIDS education and information campaigns [7]. The heavy drug use by risk takers, especially the use of nitrite inhalants, is also not unexpected considering that a number of studies [12, 13, 14] have shown drug use to be associated with high risk sexual behaviour among homosexual men. Unlike other behavioural studies, however, the present findings were observed within a cohort of men who were relatively homogeneous. The overwhelming majority of men in the VLAS cohort are white and identify as being part of the same large urban gay community.

There are several mediating factors which might help explain the association between the above sociodemographic characteristics and risk taking behaviour in this cohort. In particular, seronegative risk takers may underestimate their own susceptibility to HIV infection and instead operate under an "optimistic bias" regarding their health [15, 16]. This health belief, often referred to as personal efficacy, relates to the notion that one is capable of making necessary behavioural changes to reduce risk or improve health. Personal efficacy has been shown to be an important predictor of risk taking behaviour in homosexual and bisexual men. In particular, several studies have demonstrated that men at high risk of HIV have low personal efficacy and that men at low risk have high personal efficacy [17]. Although personal efficacy is not examined here, this belief is brought out in the

question on how AIDS had changed gay society where risk takers were more likely to report that these changes were "more bad than good."

Risk taking behaviour may also be influenced by peer group norms. Recent research on social support systems among HIV infected homosexual and bisexual men has demonstrated that race, as a possible proxy for fewer resources and greater institutional and structural barriers, works as an intermediary to affect the relationship between social support systems and mental health [18]. There is reason to believe that social support could also be an important mediating variable affecting behaviour change in seronegative risk takers. In the San Francisco Men's Health Study, loneliness and the lack of social support has been shown to be related to high risk sexual behaviour [19]. Also, several independent studies have suggested that peer group norms and support are important to the maintenance of high risk sexual behaviour [20, 21, 22]. Taken together, these studies imply that individuals are reluctant to appear more concerned about high risk taking behaviour than their peers. This is especially so with the norms of younger individuals which generally promote personal invincibility and risk taking behaviour [23].

Caution should be taken in attempting to interpret our data on risk taking behaviour of seronegative homosexual men. First, there may be problems with respondents having misstated or forgotten past sexual behaviour [24]. Although the effect of these recall problems is difficult to estimate, several studies have shown that interview-administered and self-administered questionnaires can provide reasonably reliable data concerning sexual behaviour in homosexual men when the recall period is relatively short [25, 26]. In this case, the effect of recall error is likely to be relatively small as the data collected always pertained to sexual behaviour which occurred at most a year prior to questionnaire completion.

Second, homosexual men who choose to attend family practices that provide care to large numbers of gay men may not accurately reflect the homosexual community at large. In general, this type of selection tends to overrepresent homosexual men living in urban environments who are of higher socioeconomic status and who identify with the gay community and lifestyle [7]. Furthermore, the behaviour of participants may be affected by their mere participation in a prospective study involving repeated questionnaires, physical examinations, serologic testing, and counseling by committed practitioners. This form of surveillance bias may actually help to minimize risk taking behaviour in the cohort.

In summary, we have identified sociodemographic characteristics of a subgroup of HIV negative homosexual men who continue to place themselves at high risk for infection through unprotected anal intercourse with casual partners. Risk takers were characterized as men who were younger, of lower socioeconomic status, and more likely to smoke cigarettes and to use nitrite inhalants. Potential biases associated with this study would tend to attenuate the differences between risk takers and controls and to make the seronegative men in our cohort less representative of the those in the gay community. Thus, these markers are likely to be even stronger in the community outside the context of this cohort. Ultimately, our findings suggest the importance of targeting AIDS prevention activities to younger gay men, to those of lower socioeconomic status, and to those exhibiting other risk behaviour such as smoking and use of nitrite inhalants.

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Table 1. Comparison of risk takers and controls with respect to age, annual income and education.

Variable	Risk takers	Controls	p-value
Age (at index visit)			0.013[a]
Median	35	40	
Range	22-47	24-66	
Annual income			0.002[b]
< $10,000	11 (37%)	13 (12%)	
≥ $10,000	19 (63%)	94 (88%)	
Education (completed university degree)			0.107[b]
No	21 (68%)	55 (51%)	
Yes	10 (32%)	52 (49%)	

a Based on Wilcoxon rank sum test.

b Based on chi-square test (uncorrected).

Table 2. Comparison of risk takers and controls with respect to alcohol consumption and tobacco use.

Variable	Risk takers	Controls	p-value
Alcohol (>60 drinks per month)			
No	26 (84%)	102 (94%)	0.068[b]
Yes	5 (16%)	6 (6%)	
Cigarettes			
No	13 (42%)	70 (65%)	0.022[a]
Yes	18 (58%)	38 (35%)	

a Based on chi-square test (uncorrected).

b Based on Fisher's exact test.

Table 3. Comparison of risk takers and controls with respect to uses of nitrate inhalants and other illicit drugs.

Variable	Risk takers	Controls	p-value[a]
Nitrite inhalants			
No	14 (45%)	76 (70%)	0.010
Yes	17 (55%)	32 (30%)	
Amphetamine			
No	30 (97%)	106 (98%)	0.643
Yes	1 (3%)	2 (2%)	
Cocaine			
No	26 (84%)	98 (91%)	0.277
Yes	5 (16%)	10 (9%)	
LSD			
No	30 (97%)	102 (94%)	0.601
Yes	1 (3%)	6 (6%)	
Marijuana			
No	19 (61%)	65 (60%)	0.912
Yes	12 (39%)	43 (40%)	
MDA			
No	28 (90%)	104 (96%)	0.180
Yes	3 (10%)	4 (4%)	

a Based on chi-square test (uncorrected).

Table 4. Comparison of risk takers and controls with respect to opinion regarding changes in gay society brought on by the AIDS epidemic.

Description	Risk takers	Controls	p-value[a]
More bad than good	11 (39%)	20 (20%)	0.100
More good than bad	14 (50%)	62 (62%)	
Neutral	3 (11%)	18 (18%)	

a Based on chi-square test (uncorrected).

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