The Association of Socioeconomic Status and Use of Crack/Cocaine With Unprotected Anal Sex in a Cohort of Men Who Have Sex With Men in Rio de Janeiro, Brazil

[Articles]

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To evaluate the relation between illicit drug use, sexual practices, and socioeconomic status, we analyzed data from the baseline interview of a cohort of 675 men who have sex with men conducted from 1994 to 1999 in Rio de Janeiro, Brazil. Bivariate analyses of factors associated with crack/cocaine use with sex revealed that men who reported crack/cocaine use were significantly \((p < .05)\) more likely than men who did not report drug use to be unemployed (42.7\% vs. 29.1\%), to have an income of <$250 per month (70.7\% vs. 60.9\%), to have <8 years of education (69.5\% vs. 50.9\%), to report bisexual activity (81.7\% vs. 41.7\%), and to engage in commercial sex (72.0\% vs. 37.9\%). Multivariate analysis of factors associated with unprotected anal sex with casual male partners in the last 6 months demonstrated that the following variables were associated with this outcome: an income <$250 per month (adjusted odds ratio [AOR] = 1.73, 95% confidence interval [CI]: 1.04-2.87), less than 8 years of education (AOR = 2.21, CI: 1.38-3.53), a greater sense of vulnerability (AOR = 2.58, CI: 1.54-4.33), a willingness to participate in vaccine trials (AOR = 1.91, CI: 1.20-3.05), and use of crack/cocaine (AOR = 1.91, CI: 1.05-3.46). Our findings suggest that HIV prevention programs for these men need to address drug use and how drug use may influence sexual behaviors.

Unprotected sexual intercourse has a pivotal role in the spread of AIDS worldwide, and has been intertwined with illicit drug use as a source of unabated epidemics (1). Recent articles have highlighted the fact that the relations between drug consumption and risky behavior are complex and bidirectional in nature (i.e., psychoactive substances modulate behavior, but people with certain lifestyles also seek specific mind-altering substances as a way to enhance/reinforce preexisting behaviors) (2). Unprotected sexual intercourse also increases the spread of HIV in populations exposed to parenteral risks (3). As of December 2000, sexual transmission was the mode of transmission of HIV infection in 107,004 of the 203,348 AIDS cases registered in Brazil (52.6\%). Among those cases attributed to unprotected sexual intercourse, 54,777 (51.2\%) cases have been reported among men having sex with men (MSM) (4).

Although the Brazilian literature is quite informative regarding risk behaviors and infection rates for different blood-borne and sexually transmitted infections among injection drug users (IDUs) (5-9), few reports have explored the interaction between non-injection drug use and sexual risk behaviors in Brazil (10,11).
To the best of our knowledge, the interrelations between drug use and sexual risk behaviors have never been studied among MSM in Brazil. Available evidence is of concern, however: 6059 AIDS cases registered in Brazil to date are among MSM who are also IDUs (4).

The vast majority (81%) of AIDS cases among IDUs registered in Brazil have occurred in men (4), and men predominate in all studies addressing IDUs and non-injecting drug users carried out so far, whether they were recruited in street settings (5,7), drug treatment centers (11), or both (6,9). Consistent condom use has been reported by <20% of IDUs and non-injecting drug users in different Brazilian settings (5-11); some of these unprotected sexual acts involve gay and bisexual men (6,11).

In this article, we analyze data assessing alcohol and illicit drug-using behaviors that were included in the baseline interview of an MSM cohort conducted between 1994 and 1999 in Rio de Janeiro, Brazil. Our purpose here is to evaluate the relation between illicit drug use and sexual attitudes and practices.

**MATERIALS AND METHODS**

This study was conducted by the Research Center Evandro Chagas Hospital of the Oswaldo Cruz Foundation, and detailed methods have been reported previously (12,13). This study was approved by the local ethics committee.

**Study Population**

Entry criteria for this study were being male, HIV-seronegative, ever having sexual activity with other men (male homosexual intercourse), and being between 18 and 50 years of age. We used a targeted sampling method in which volunteers were mainly recruited through outreach activities (e.g., by study volunteers themselves [snowball] and nongovernmental organizations) and by media advertising and referrals from health care facilities in venues that were frequented by gay men.

**Study Procedures**

Men (n = 1224) who could potentially participate in the study were first screened for HIV, syphilis (Venereal Disease Research Laboratory confirmed by *Treponema pallidum* hemagglutination), and hepatitis B (anti-HBc, anti-HBs, HBsAg) but were not offered enrollment in the study as is standard practice at this research hospital. All men received pretest counseling. On their return, these men received their HIV and other test results during a standard posttest counseling session, and standard hospital procedures for referral were followed if necessary. Only men who were HIV-negative were asked to enroll. If they agreed, they were given a detailed explanation of the study and were asked to sign an informed consent form and to complete a questionnaire. The minimal sample size that had been calculated for the study was 500; however, we were able to enroll 675 HIV-negative men. All participants were given approximately $10 each visit to reimburse them for transportation expenses and the cost of one meal; they also received condoms.
To maintain confidentiality, each patient was assigned a code number. This code number was placed on the questionnaire, consent form, all blood samples, and any additional forms. No names were placed on any forms or blood samples. The key linking name to code number was kept in a locked file cabinet to which only study personnel had access.

**Study Instruments**

A standardized Portuguese questionnaire was developed and administered by trained study staff. This questionnaire was pilot tested and subsequently revised. The form contains approximately 100 (mainly closed) questions on sociodemographic characteristics, knowledge about HIV transmission routes and prevention strategies, beliefs and attitudes toward AIDS and sexual life, sexual practices, sexually transmitted disease/AIDS preventive initiatives, and drug use.

The use of illicit drugs was assessed through the following question: In the last 6 months, have you used drugs in situations associated with sexual activity? The possible responses were always, frequently, occasionally, rarely, and never. An exploratory analysis revealed no significant differences between men who reported doing this activity always or frequently and those who reported using drugs with sex occasionally or rarely (data not shown). We therefore considered men who reported any drug use with sex to be drug users.

Men who used drugs during sex were also asked what type of drug they used. We found that 82 men reported using cocaine/crack. Forty-six of these men also use other drugs (e.g., marijuana, amphetamines, inhalants), and 9 men did not specify the type of drug they used. We removed these 55 men from the analysis.

Eight interviewees reported having injected cocaine. These injectors were included in the crack/cocaine use category.

**Statistical Analysis**

In the bivariate analyses, we compared proportions for crack/cocaine use and no drug use groups with the $\chi^2$ test, and $t$ tests for means were used for continuous variables. Statistical significance was defined by $p$ values less than .05.

We then specifically examined two sexual behavior outcomes: unprotected anal sex with steady male partner in the last 6 months and unprotected anal sex with casual male partner in the last 6 months in relation to crack/cocaine use. Although we did ask about unprotected sex with women (bisexual behavior) in the last 6 months, these data are not presented in this report. Because unprotected anal sex with casual male partner in the last 6 months was found to be associated with crack/cocaine use, we further reported the relation of several variables to this outcome. We did a bivariate analysis comparing proportions between groups and calculated odds ratios (ORs) and 95% confidence intervals (CIs). Statistical significance was defined by an OR that did not overlap 1.
To further assess the role of the different variables, we created logistic regression models with unprotected anal sex with casual male partners in the last 6 months as the dependent variable. All variables significantly associated with the response variable ($p < .05$ or OR did not overlap 1) and/or borderline associations formerly mentioned in the literature were entered in the multivariate analysis, which was performed with SPSS Version 7.5 (Prentice Hall, Upper Saddle River, NJ, U.S.A.) using backward elimination. All variables that remained in the model were checked for colinearity (i.e., Pearson product-moment correlation $> 0.5$), but no colinearity was found. Additionally, we did not find any interaction between all significant variables in the model and crack/cocaine use.

**RESULTS**

Of 675 participants, 37 (5.5%) could not be classified in relation to their drug use, because information was missing. We found that 501 (74.2%) participants did not use drugs and that 137 (20.3%) used drugs. Among drug users, 82 (59.9%) used cocaine or crack, 46 (33.6%) used other types of drugs (e.g., marijuana, inhalants), and 9 (6.5%) did not report the type of drug used. Our analysis is based on 82 men who reported crack/cocaine use during sex and 501 who denied use of any drugs during sex.

On bivariate analysis, we first examined the association between crack/cocaine use and either sociodemographic or sexual variables. In relation to sociodemographic characteristics, we found there was not a significant difference between crack/cocaine users and men who did not use drugs by marital status or age (Table 1). We did find that crack/cocaine users were significantly ($p < .05$) more likely than non-drug users to be unemployed (42.7% vs. 29.1%; $p = .01$), to have an income of <$250 per month (considered below the poverty level) (70.7% vs. 60.9%; $p < .001$), to be nonwhite (65.8% vs. 47%; $p = .002$), and to have <8 years of education (69.5% vs. 50.9%, $p = .001$). We did not find differences in the use of health care services.

**TABLE 1.** Sociodemographic behavioral characteristics of HIV-negative men who have sex with men according to drug use in Rio de Janeiro, Brazil (1994-1999)

<table>
<thead>
<tr>
<th>Category</th>
<th>No Drug Use</th>
<th>Crack/Cocaine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployed</td>
<td>29.1%</td>
<td>42.7%</td>
</tr>
<tr>
<td>Income &lt;$250</td>
<td>60.9%</td>
<td>70.7%</td>
</tr>
<tr>
<td>Nonwhite</td>
<td>47%</td>
<td>65.8%</td>
</tr>
<tr>
<td>&lt;8 years of education</td>
<td>50.9%</td>
<td>69.5%</td>
</tr>
</tbody>
</table>

In relation to sexual variables, we found that men who did not use drugs were significantly more likely to have a steady male partner (57.9%) than crack/cocaine users (31.7%) (see Table 1). Conversely, crack/cocaine users were significantly more likely to have casual male partners (75.6%) than non-drug users (62.9%). Additionally, we found that crack/cocaine users were significantly more likely than men who did not use drugs to report
bisexual activity (81.7% vs. 41.7%; \( p < .001 \)) and to engage in commercial sex (72.0% vs. 37.9%; \( p < .001 \)).

We did not find differences between the two groups in relation to self-perception of vulnerability to HIV infection, willingness to participate in an HIV vaccine trial, and serologic markers for syphilis and hepatitis B. We did find that crack/cocaine users were more likely than non-drug users to drink alcohol (76.8% vs. 45.7%, \( p < .001 \)), however.

We examined the relation between crack/cocaine use and unprotected anal sex with a steady partner in the past 6 months and found no significant association. We did find an association with unprotected anal sex with a casual male partner in the last 6 months, however. We therefore performed further bivariate analyses to examine whether other variables were associated with unprotected anal sex with a casual male partner in the last 6 months (Table 2). We found that an income <US$250.00 per month (OR = 1.80), being nonwhite (OR = 2.31), <8 years of education (OR = 2.31), self-perception of vulnerability (OR = 2.06), use of alcohol (OR = 1.47), bisexuality (OR = 1.74), and willingness to participate in HIV vaccine trials (OR = 1.56) were associated with unprotected anal sex with a casual male partner in the last 6 months. No other sociodemographic or behavioral variables were associated with this type of unprotected anal sex.

<table>
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<tr>
<th>TABLE 2. Factors associated with unprotected sex with casual male sex partners among HIV-negative men who have sex with men according to baseline interview in Rio de Janeiro, Brazil (1994-1999)</th>
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<tbody>
<tr>
<td>Receptive or insertive anal sex without a condom in the last 6 months.</td>
</tr>
<tr>
<td>Significant differences at the level of ( p &lt; 0.05 ). OR, odds ratio; CI, 95% confidence interval.</td>
</tr>
</tbody>
</table>

We then did a multivariate analysis to examine what factors were associated with unprotected anal sex with a casual male partner in the last 6 months. In this multiple logistic regression analysis, we found that five factors were associated with this outcome (see Table 2). These were income <US$250 per month (adjusted OR [AOR] = 1.73, CI: 1.04-2.87), less than 8 years of education (AOR = 2.21, CI: 1.38-3.53), self-perception of vulnerability (AOR = 2.58, CI: 1.54-4.33), willingness to participate in vaccine trials (AOR = 1.91, CI: 1.20-3.05), and use of crack/cocaine (AOR = 1.91, CI: 1.05-3.46). There were no significant interactions between variables.

DISCUSSION

We found that among a cohort of HIV-negative MSM in Rio de Janeiro, 20.3% reported drug use associated with sexual activity in the prior 6 months, of whom most (60%) used crack/cocaine. Crack/cocaine use was more prevalent among men of lower socioeconomic status. When we specifically examined which factors were associated with unsafe sexual practices, we found that both crack/cocaine use and lower socioeconomic status were independently associated with unprotected anal sex in the last 6 months. Our study is the first published study in Brazil that analyzes the interaction between drug use and sexual
behaviors among HIV-negative MSM-behaviors that are key to incorporate in the design of appropriate HIV prevention programs for these men.

Crack/cocaine use in our cohort did not influence sexual behavior with steady sex partners in that both drug users and non-drug users were less likely to report using condoms with their steady partner. This has been found in many studies (14-16). It is most likely that the decision to not use condoms with one's steady sex partner is associated with mutual trust (13).

Conversely, participants who reported crack/cocaine use were more likely to engage in unsafe sexual practices with casual partners, a behavior that can place them at high risk for HIV and STD infections. Many studies have shown that drug use influences sexual behavior, often resulting in sexual practices that are riskier than those practiced when not under the influence of drugs (14,17-26). HIV prevention programs for MSM should address drug use associated with sexual behavior.

These crack/cocaine users were of low socioeconomic status and frequently unemployed, with incomes of less than $250 per month and low levels of education. This finding is similar to that of studies of current and former crack/cocaine users in the city of São Paulo (27-29) and of commercial sex workers who used cocaine in Santos, São Paulo (10). Poverty can contribute to HIV transmission, because it is often associated with instability, inequality, discrimination, and disrespect of human rights-factors that make it difficult to protect oneself against HIV infection (30-33).

Besides being of lower socioeconomic status, crack/cocaine users may be more likely to engage in multiple risky behaviors than persons who do not use drugs. Crack/cocaine users in our study and others were more likely to report using alcohol, engaging in commercial sex (34,35), practicing bisexual activity (36), and perceiving themselves to be vulnerable to HIV infection (37) than men who did not use drugs. This last finding has been reported to be associated with a greater willingness to participate in vaccine trials in several studies (38,39). In an earlier analysis of our cohort, we also found men who perceived themselves vulnerable to HIV infection to be more willing to participate in vaccine trials than other men (13) (de Souza et al., unpublished data, 2001). This suggests that recruitment of drug-using MSM in vaccine trials should be feasible.

There are several limitations to our study. Because the question specifically asked only about drug use associated with sex, we may actually have more drug users in the cohort than we detected. The small number of IDUs does not allow any separate analysis of this group; however, evidence suggests that the majority of drug users in Rio de Janeiro, Brazil, do not inject (11).

Not only are drug-using MSM at higher risk for HIV infection, but once they become HIV infected, they can facilitate the spread of HIV to other segments of society through their commercial sex and bisexual activity. Our findings suggest that HIV prevention programs for these men need to address drug use not only to inform MSM of how drug use may influence their sexual practices but to assist MSM who use crack/cocaine to stop using
there are drugs. Incorporation of our findings in HIV prevention programs in Brazil may contribute to a reduction in the spread of HIV.

Acknowledgments: TOP

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