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## Sexual Risk Behaviors and Substance Use Among Alcohol Abusing HIV-Positive Men Who Have Sex With Men†

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### Abstract

An ethnically diverse sample (79.0% men of color) of HIV seropositive (HIV+) men who have sex with men (MSM) with alcohol use disorders from the New York City metropolitan area was recruited from a variety of settings frequented by such men. Data were collected using quantitative assessments and calendar based techniques at the baseline assessment of a longitudinal study assessing the relationship between alcohol and substance use and sexual risk behaviors as well as alcohol use and HIV disease progression. Data were selected on a sample of 253 HIV+ MSM (mean age = 38.55, SD = 6.73). Of these, the majority of participants (80.2%, n = 203) reported engaging in sexual behaviors with casual partners. In terms of sexual behaviors that put partners at greatest risk for HIV transmission, unprotected anal insertive intercourse was most likely to occur with unknown status casual partners (46.8%, n = 95) than with either HIV negative casual partners (19.2%, n = 39) or with HIV+ casual partners (40.8%, n = 83). Further, bivariate analyses indicated significant relationships between the use of several substances and sexual behaviors that put partners at greatest risk for HIV transmission, as well as a significant positive relationship between drinks per drinking day and viral load.

### Keywords

alcohol; HIV; men who have sex with men; sexual risk behaviors; substance use

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Although 70% of HIV seropositive (HIV+) persons engage in oral, vaginal, or anal sex after learning of their HIV status, typically less than 30% of these individuals report anal or vaginal intercourse without the use of a condom (Marks, Burris & Peterman 1999). Unprotected vaginal or anal intercourse has been reported by 29% of men with AIDS in Los Angeles County (Simon et al. 1999), 27% of men and women living with HIV/AIDS in Wisconsin (Heckman, Somlai

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& Otto-Salaj 1998), 26% of men and women with HIV in Switzerland (Eich-Hochli et al. 1998), 26% of HIV+ male drug users (Kalichman, Belcher & Cherry 1997), 24% of HIV+ persons in Minnesota (Rosser, Gobby & Carr 1999), and 18% of HIV+ heterosexual men with hemophilia (Parsons et al. 2000).

Among HIV+ men who have sex with men (MSM), this pattern is consistent (Benotsch, Kalichman & Kelly 1999; Darrow, Webster & Kurtz 1998; de Vroome et al. 1998; Robins, Dew & Kingsley 1997). In these studies, however, the prevalence of unprotected anal intercourse differs by whether the HIV+ man is the insertive or receptive partner. Among HIV+ MSM in Los Angeles County, 22% reported unprotected anal insertive (UAI) sex, whereas 27% reported unprotected anal receptive (UAR) intercourse (Simon et al. 1999). Other studies of HIV+ MSM have found even greater disparities: 22% reported UAI compared to 33% reporting UAR in a study by Kalichman, Kelly & Rompa (1997), and 30% reported UAI compared to 56% reporting UAR in another study (Hays, Kegeles & Coates 1997). A recent study of HIV + MSM from New York City found that although 30% reported any unprotected anal sex with a partner of HIV negative or unknown serostatus, only 18% reported UAI and 25% reported UAR (Parsons & Halkitis 2002).

Alcohol use has frequently been identified as a factor related to unsafe sexual behaviors (Bolton, Vincke & Mark 1992). Studies of HIV+ MSM have confirmed this correlation between alcohol use and unprotected sexual practices (Purcell et al. 2001; Dolezal et al. 1997; Kalichman, Kelly & Rompa 1997). Other studies, however, have failed to show an association between alcohol use and unsafe sex among samples of MSM (Crosby et al. 1996). A recent review of event-level studies on the connection between alcohol use and risky sex found little evidence for a direct connection (Weinhardt & Carey 2000). Others have suggested and found that other variables, such as outcome expectancies and sensation seeking, may play a role in predicting both unsafe sex and alcohol use (Kalichman, Weinhardt & DiFonzo 2002; Kalichman, Heckman & Kelly 1996; Leigh & Stall 1993).

Of particular concern among HIV+ MSM are the immunosuppressant effects of alcohol use. Studies have shown that alcohol use reduces neutrophil and T cell-dependent immune functions (Stoltz et al. 1999; Waltenbaugh, Vasquez & Peterson 1998; Brodie, Domenico & Gelfand 1994). Alcohol may increase viral replication, affecting the immunopathogenic mechanisms of HIV-1 (Bagasra et al. 1996, 1993). A relationship between alcohol use and accelerated HIV disease has been identified in multiple studies (Wang, Liang & Watson 1997; Balla et al. 1994; Fong et al. 1994). Thus, alcohol use is a cofactor that negatively impacts the course of HIV infection and pathogenesis (Dong et al. 2000; Petry 1999). Evidence has shown that alcohol use increases CYP3A4 activity (Flexner et al. 2001). As such, alcohol-using HIV+ persons taking HIV medications metabolized by CYP3A4 may experience enhanced drug metabolism resulting in reductions in therapeutic drug levels (Slain et al. 2000). However, it has also been shown that these negative effects can be reversed following a two-week period of alcohol abstinence (Flexner et al. 2001; Hoshino & Kawaski 1995). Alcohol use has been identified as a risk factor for pancreatitis (Moore, Keruly & Chaisson 2001) and oral lesions (Nittayananta et al. 2001) among HIV+ persons. It has been suggested that alcohol use among those on highly active anti-retroviral therapy (HAART) may increase bone marrow toxicity and increase hematopoietic impairment (Prakash et al. 2001). One study found that alcohol use decreased CD4 counts (Pol, Artru & Thepot 1996), and abstinence from alcohol resulted in improvement in CD4 cell count.

Rates of alcohol use among HIV+ persons have been shown to exceed that found in the general population (Petry 1999). Lifetime prevalence for alcohol use disorders (those meeting dependence or abuse criteria) among HIV+ persons have ranged from 29% to 60% (Kelly et al. 1998; Dew et al. 1997; Summers et al. 1995; Rosenbeger et al. 1993; Brown et al. 1992). In

a representative sample of HIV+ adults in the United States, 53% screened positive for alcohol use in the past month (Bing et al. 2000). Another study of HIV+ gay men found that 82% were current users of alcohol (Lefevre et al. 1995).

In this article, the authors seek to understand the relationship between HIV sexual risk behaviors and substance use, utilizing an ethnically diverse sample of HIV+ MSM with alcohol use disorders. Data for this investigation were collected as part of a larger intervention study utilizing a harm reduction counseling intervention for HIV+ MSM concerned about their alcohol use and/or unsafe sexual practices.

## METHODS

### Design

The data were collected from the baseline assessment of a sample of HIV+ MSM with alcohol use disorders recruited as part of a larger intervention study called Positive Choices, conducted by the authors from 1997 through 2002 (see also Parsons et al. 2004). All research activities were reviewed and approved by the Institutional Review Board of Hunter College.

### Participants

A total of 513 participants phoned the project line for initial screening. Of these, 157 were excluded because they failed to meet eligibility criteria at the time of screening (biological male, self-identified as HIV+, report anal or oral sex with another man in the past three months, eligible AUDIT score, report use of alcohol in the past 30 days, and age of 18 or greater). As a result of the screening, 356 participants were eligible for the study. A total of eight men were not interested in the study, and an addition 69 eligible participants failed to show up for their scheduled baseline interview.

A total of 279 participants completed the baseline assessment. Of these, 17 were excluded due to comorbidity with Axis I disorders and nine were excluded for failing to meet final eligibility requirements, resulting in 253 men in the final sample for analyses. There were no significant differences in AUDIT scores between those eligible who did not show for their baseline assessments ( $M = 22.28$ ,  $n = 77$ ), those who completed the baseline ( $M = 21.93$ ,  $n = 253$ ) and those who were excluded after the baseline interview ( $M = 23.04$ ,  $n = 26$ ).

### Procedure

Participants were recruited using two different strategies: (1) active recruitment—where recruiters went into various venues, described the study, encouraged participation, and provided phone numbers to enroll; and (2) passive recruitment—where written materials about the study were left in stores, AIDS service agencies and other venues. The recruitment efforts were based on a targeted sampling strategy, designed to obtain systematic information because true random sampling was not feasible (Watters & Biernacki 1989). Although targeted sampling cannot assure representativeness of the sample, it can be used to enhance the degree to which the sample includes participants who come from a variety of backgrounds, reside within different social circles, and participate in gay, bisexual, and/or HIV/AIDS communities to varying degrees.

Participants were actively recruited from two types of venues: (1) AIDS service organizations, and (2) mainstream gay venues (e.g., bars, cafes, and streets in predominately gay neighborhoods). Participants were also passively recruited using tear-off flyers, study cards, advertisements in gay and mainstream publications, as well as through referrals from friends. In terms of the baseline sample, 23.3% ( $n = 59$ ) of the men were recruited from AIDS service organizations, 45.8% ( $n = 116$ ) from mainstream gay venues, and 30.4% ( $n = 77$ ) were referred

by friends or other participants. To protect against inadvertent disclosure of HIV status, each potential participant was given a project business card providing basic information about the study and was told: “If this doesn’t apply to you, please give it to someone you know.” As a result, some men were enrolled in the study through friendship referrals or snowball sampling. Substantial efforts were made to ensure that an ethnically diverse sample was obtained. These efforts included specific targeting of venues serving the needs of HIV+ MSM of color.

Men were screened by telephone to determine eligibility. Individuals who were interested and eligible were then scheduled for a baseline interview. At the baseline interview, participants provided informed consent and then completed the self-administered baseline measures. Participants were paid \$30 for participating in the baseline assessment.

## Materials

The data reported here were based on the baseline quantitative surveys completed by the 253 eligible participants. The assessment took approximately 90 to 120 minutes to complete, and addressed a variety of factors, including health status, medication use and adherence, prevalence and frequency of sexual behaviors by partner type (primary versus nonprimary) and partner serostatus (HIV+, HIV-, or HIV serostatus unknown) over the last three and 12 months, prevalence and frequency of drug and alcohol use, psychosocial variables (e.g., self-efficacy for safer sexual behavior, norms, outcome expectancies), serostatus disclosure, mental health status, and demographic characteristics. To avoid the loss of participants due to missing data on each of the scales used in the survey, mean responses rather than total score responses were computed for all of the mental health, psychosocial, and social cognitive scales. The following sections of the survey were utilized in the analyses presented in this article.

**Sociodemographics**—Participants were asked to self-report their age, race/ethnicity, employment status, income, number of years since HIV+ test result, and sexual orientation.

**Self-reported health**—Participants were asked to provide information on their most recent results of CD4 count and HIV plasma viral load. CD4 counts were assessed with a continuous variable, and viral loads with a categorical variable (e.g., undetectable, detectable but less than 10,000 copies/ml, etc.). A single yes/no item was used to ascertain whether the participant experienced HIV-related symptoms for the period of three months prior to assessment.

**Sexual behaviors**—Sex behaviors were assessed by asking participants to indicate the frequency of eight sexual behaviors in the three months prior to completion of the survey. HIV researchers have advocated for the use of openended frequency measures of sexual risk behaviors as they help to communicate expectations that such behaviors occur and are not abnormal (Weinhardt et al. 1998; Catania et al. 1990). These measures were comparable to others used with gay men that have shown that past three month assessment periods for sexual risk behaviors are reliable (Kauth, St. Lawrence & Kelly 1991), and they utilized easy to understand terminology which was developed in conjunction with a Community Advisory Board of HIV+ MSM. Frequencies were ascertained for each behavior with and without the use of condoms, and separately for HIV-, HIV+, and HIV status unknown nonprimary partners. For the purposes of the analyses presented in this article, the authors focused on two sexual behaviors: unprotected anal insertive (UAI) and unprotected anal receptive (UAR) intercourse, and frequencies of UAI and UAR were collapsed to include both those acts with and without ejaculation.

**Alcohol use**—The Alcohol Use Disorders Identification Test (AUDIT) is a 10-item self-report questionnaire that measures alcohol consumption, dependence symptoms, and personal and social harm reflective of drinking. The AUDIT has excellent psychometric properties and

has been found to be superior to other self-report screening measures (Reinert & Allen 2002). Participants were eligible for the study if their AUDIT score was eight or greater. In addition, participants with AUDIT scores of six or seven were deemed eligible if they also reported that they drank alcohol before sexual activity “often” or “always.” In addition, information about alcohol use was collected through the use of a Timeline Followback Interview (TLFB). TLFB measures have been found to reliably collect retrospective estimates of daily drinking (Sobell et al. 1996). The consumption of alcohol was calculated as the number of standard drinks per drinking day and the percent days abstinent (Sobell & Sobell 1992). In addition, participants completed checklists of symptom problems for both alcohol and drugs from the DSM-IV in order to classify participants as alcohol/drug dependent or alcohol/drug abusing.

**Substance use**—Use of recreational drugs was assessed for the three months prior to evaluation, using five-point Likert items to assess frequency of use (Parsons & Halkitis 2002; Purcell et al. 2001). For recreational drugs, eleven specific substances were assessed. For analyses, use was trichotomized such that a score of 0 reflected no use during the past three months; a score of 1 reflected use either “less than once a week” or “one or two times per week;” and a score of 2 reflected use either “greater than twice a week” or “every day.”

## RESULTS

### Sample Characteristics

All 253 participants were HIV+biological males; 1.6% (n = 4) reported being transgendered but had not undergone sexual reassignment surgery. The mean age was 38.55 (SD = 6.73) years and ages ranged from 19 to 61. The sample was ethnically diverse, with 79.0% (n = 200) identifying as men of color (See Table 1 for detailed sociodemographics). The majority of participants (73.1%, n = 185) identified as gay or homosexual. Most of the participants (85.4%, n = 216) had at least a high school education or equivalent and 59 (23.3%) had a college degree. More than a third (37.9%, n = 96) reported some form of employment and 23.3% (n = 59) were on disability. A third of the sample (34.4%, n = 87) reported some previous incarceration.

Participants had tested HIV+ an average of 10 years (SD = 4.73) prior to the baseline assessment, and the mean for the most recent CD4 count was 419 (SD = 264). For self-reported viral load, 33.6% (n = 85) reported an undetectable viral load and 9.9% (n = 25) reported that they did not know their viral load. The majority of participants reported not having an AIDS diagnosis (54.9%, n = 139), having some access to HIV medical care (97.2%, n = 246), and having some form of health insurance (85.8%, n = 217). Differential effects by race/ethnicity were found; White participants had tested positive for HIV for more years than African American or Latino men ( $F(3, 244) = 3.18, p < .05$ ). No differential effects by race/ethnicity were found for CD4 count, viral load, or AIDS diagnosis.

### Alcohol Use

The 253 men in the sample were unique in that they were HIV+ MSM with alcohol problems, but were not recruited from alcohol treatment venues. Given this distinction, the range of alcohol use/abuse in the sample was quite varied. The vast majority of participants (73.1%, n = 185) met the DSM-IV criteria for alcohol dependence, while (4.7%, n = 12) met criteria for alcohol abuse. More than half (53.4%, n = 135) had been treated for alcohol abuse in the past, and 45.1% (n = 114) reported a history of drug abuse treatment (see Table 1).

Based on standard AUDIT criteria, 22.1% (n = 56) of the sample were classified as “risky drinkers” (AUDIT scores ranging from eight to 15), 45.1% (n = 114) were classified as “heavy drinkers” (AUDIT scores ranging from 16 to 25), and 32.8% (n = 83) were classified as “hazardous drinkers” (AUDIT scores ranging from 26 to 40). Nearly all of the men (97.6%, n

= 247) had consumed alcohol in the 30 days prior to the intake assessment. The mean number of standard drinks consumed on drinking days was 7.81 (SD = 5.76), although 20.5% of the sample (n = 52) reported more than 11 standard drinks per drinking day.

Men with a detectable viral load (>500 copies/ml; n = 156) reported significantly more drinks per drinking day (M = 8.62, SD = 6.53) than men with undetectable (M = 6.51, SD = 4.01) viral loads ( $F(6, 233) = 2.64, p = .017$ ). No differential effects by age, race/ethnicity, sexual orientation, CD4 count, AIDS diagnosis or years HIV+ were found based on AUDIT score, DSM-IV criteria for alcohol abuse versus dependence, or drinks per drinking day.

## Drug Use

Recreational drug use was reported by the majority of participants; 70.0% (n = 177) indicated the use of at least one substance in the three months prior to assessment. A summary of usage is provided in Table 2. The most commonly used substance was marijuana, as 49.8% (n = 126) indicated at least some use in the previous three months. In addition, 30.4% (n = 77) of the sample reported use of cocaine, and 22.9% (n = 58) reported using crack. Approximately half the men (n = 129, 51.0%) met the DSM-IV criteria for substance dependence, while 7.1% (n = 18) met the DSM-IV criteria for substance abuse, and 35.6% (n = 90) had no diagnosis of substance abuse or dependence.

Differential effects by race/ethnicity for drug use were identified only for crack cocaine use, ( $\chi^2(3) = 10.48, p < .05$ ), with African Americans (n = 42, 72.4%) more likely than White (n = 5, 8.6%), Latino (n = 5, 8.6%) and other (n = 6, 10.3%) participants to report the use of crack. Younger men reported more frequent use of marijuana ( $r = -.18, p = .01$ ), and older men reported more frequent use of crack ( $r = .17, p < .05$ ) and opiates ( $r = .15, p = .05$ ). Sexual orientation was significantly related to marijuana and cocaine use. For marijuana, gay men reported more days of use (M = 6.52, SD = 9.77) compared to bisexual men (M = 3.69, SD = 7.39) ( $F(1, 233) = 4.09, p < .05$ ). For cocaine, bisexual men reported more days of use (M = 1.72, SD = 3.35) compared to gay men (M = 0.94, SD = 2.25) ( $F(1, 233) = 4.06, p < .05$ ).

Although drug use was not significantly related to CD4 count, viral load, or AIDS diagnosis, use of some drugs was related to years HIV+. Men who tested positive for HIV more recently were more frequent users of hallucinogens ( $r = .14, p = .05$ ), but men who had lived more years with HIV reported more frequent use of opiates ( $r = -.18, p = .001$ ).

There was a relationship between level of alcohol use and specific drugs used, with “heavy drinkers,” as determined by AUDIT scores, more likely to report marijuana use ( $\chi^2(2) = 9.24, p = .01$ ) than “risky” or “hazardous drinkers.” Also, “hazardous drinkers” were more likely to report crack use ( $\chi^2(2) = 7.22, p < .05$ ) than either “risky” or “heavy” drinkers. Further, “hazardous drinkers” were more likely to score as dependent on the DSM-IV drug classification ( $\chi^2(4) = 14.701, p < .01$ ) than either “risky” or “heavy” drinkers.

## Sexual Behaviors

Of the 113 men (44.7%) in the baseline sample who reported having a main or primary sex partner, 93.8% (n = 106) reported that the main partner was a male, 1.8% (n = 2) reported having a female main partner, and 1.8% (n = 2) reported having a transgendered main partner (biologically male with penis intact). The majority (88.5%, n = 100) reported having sex with their main partner in the previous three months, 61.1% (n = 69) reported having sex with a male casual partner (i.e., any sexual partner other than a main or primary partner), and 8.0% (n = 9) reported having sex with a female casual partner. In addition, 38.0% (n = 43) of participants with main partners reported thinking that their main partner had engaged in sex with other people in the last three months. In terms of main partners' HIV status, 50.4% (n =

57) of participants reported that their main partners were HIV+, 35.4% (n = 40) reported that their main partners were HIV-, 5.3% (n = 6) reported not knowing the HIV status of their main partner, and 8.8% (n = 10) did not provide data on their main partner's HIV status.

The majority of participants (87.7%, n = 222) reported some sexual activity in the 30 days prior to intake, and of those having sex, 84.2% (n = 187) reported at least one unsafe sex day where a condom was not used. For participants reporting sex with their main partners only (n = 38), a minority (26.3%, n = 10) reported UAI with an HIV- or unknown status main partner (see Table 3). For UAR, 31.6% (n = 12) reported this behavior in the last three months with their HIV- or serostatus unknown main partner.

The majority of participants (80.2%, n = 203) reported engaging in sexual behaviors with casual partners. Of these participants, 71.9% (n = 146) reported sex with HIV status unknown casual partners, 58.1% (n = 118) with HIV+ casual partners, and 27.6% (n = 56) with HIV- casual partners. UAI was less likely to occur with HIV- casual partners (19.2%, n = 39) than with HIV+ partners (40.8%, n = 83) and with unknown status casual partners (46.8%, n = 95). Similarly for UAR, participants were less likely to have engaged in this behavior with HIV- partners (17.2%, n = 35) than with HIV+ partners (31.0%, n = 63) or with HIV status unknown casual partners (41.9%, n = 85) (see Table 3). Significantly more participants reported UAI with HIV+ casual partners (n = 83, 40.8%) compared to casual partners that were HIV- or status unknown ( $\chi^2(1) = 4.477, p < .05$ ). In addition, significantly more participants reported UAR with HIV status unknown partners (n = 85, 41.9%) compared to HIV+ or HIV- partners ( $\chi^2(1) = 4.58, p < .05$ ). Sexual risk behaviors with casual partners were not significantly related to sociodemographic factors (race/ethnicity, sexual orientation, educational level, employment, years HIV+), or markers of HIV disease progression (CD4, viral load, AIDS diagnosis).

The mean number of sexual partners for the entire sample was 8.94 (SD = 18.06). Repeated measures analysis of variances indicated a significant difference ( $F(1, 196) = 17.75, p = .000$ ), between the number of unknown HIV status partners (M = 6.85, SD = 17.79) compared to HIV+ (M = 1.42, SD = 2.83) and HIV- (M = 0.91, SD = 3.30) partners.

A minority of men (n = 55, 22.7%) reported having group sex in the last three months; 17.4% (n = 44) reported that they gave men money or drugs to have sex with them in the last three months, while 24.5% (n = 62) of the men reported that men had given them money or drugs to have sex with them in the last three months.

### Use of Alcohol and Drugs Before and During Sex

The majority of participants (92.1%, n = 233) reported that they used alcohol before or during sex in the past three months. In terms of substance use coinciding with sex, 50.9% (n = 129) of participants reported using marijuana, 34.7% (n = 88) cocaine, 32.0% (n = 81) inhalants (amyl nitrate, or "poppers"), and 30.7% (n = 77) crack. Use for all other substances in conjunction with sex was reported at the rate of less than 10%.

### Relationship Between HIV Sexual Risk Behaviors and Substance Use

There was a significant relationship found between certain HIV sexual risk behaviors with casual partners and the use of several substances. While there was no relationship between substance use and whether participants engaged in either UAI or UAR, substance use was found to be related to an increased number of acts involving sexual risk behaviors. The number of unknown status casual partners that participants engaged in UAI with was significantly related to the use of marijuana ( $F(1, 141) = 4.11, p < .05$ ) stimulants ( $F(1, 193) = 12.49, p = .001$ ), hallucinogens ( $F(1, 193) = 7.73, p < .01$ ), opiates ( $F(1, 193) = 12.10, p = .001$ ), inhalants

( $F(1, 193) = 7.25, p < .01$ ) and other drugs ( $F(1, 193) = 6.78, p = .01$ ). In addition, the number of acts of UAR with unknown status casual partners was also related to the use of stimulants ( $F(1, 193) = 9.38, p < .01$ ), hallucinogens ( $F(1, 193) = 9.36, p < .01$ ), opiates ( $F(1, 193) = 8.54, p < .01$ ), inhalants ( $F(1, 193) = 8.95, p < .01$ ) and other drugs ( $F(1, 193) = 7.44, p < .01$ ).

With HIV-negative casual partners, substance use was related to an increased number of acts of UAR, but not UAI. Stimulants ( $F(1, 193) = 5.19, p < .05$ ), hallucinogens ( $F(1, 193) = 7.78, p < .01$ ), opiates ( $F(1, 193) = 6.05, p < .05$ ), and other drugs ( $F(1, 193) = 8.90, p < .01$ ) all showed significant relationships with acts of UAR. Interestingly, inhalants were not significantly related to any HIV sexual risk behavior with HIV-negative casual partners.

While substance use did have an impact on HIV sexual risk behavior, no differential effects for alcohol use were identified. There was no relationship between unprotected sex and alcohol use, drinks per drinking day, AUDIT score, or DSM-IV classification.

## DISCUSSION

Consistent with other studies of the sexual behaviors of HIV+ MSM (Parsons & Halkitis 2002; Fisher et al. 1998; Hoff, Stall & Paul 1997; Marks et al. 1994), the current study found that unprotected anal sex occurs more frequently with other HIV+ partners than with HIV- partners. Notable, however, is that rates of unprotected anal sex with unknown status partners were more prevalent than with either HIV+ or HIV- non-primary partners. The results of this study corroborate other studies (Halkitis & Parsons 2002; Van de Ven et al. 2002; Semple, Patterson & Grant 2000; Simon et al. 1999) which have shown that HIV+ MSM engage in harm reduction strategies in terms of HIV sexual risk behaviors with nonprimary sexual partners. Partner serostatus, however, remains an issue of concern. These findings suggest that HIV+ MSM behave as if their status-unknown casual partners are, in fact, HIV+ partners. They engage in especially high rates of UAI and UAR, putting partners at greatest risk for HIV transmission. Further, while the use of alcohol was not significantly related to whether or not MSM engaged in risky sex, because the majority of participants (94.3%,  $n = 233$ ) in this sample reported using alcohol before or during sex, we believe that alcohol may be having a moderating effect on their sexual experiences, promoting disinhibition and contributing to assumptions about the status of unknown or anonymous partners.

Regarding the use of substances associated with unsafe sex, these findings indicated a relationship between an increased number of acts of sexual risk behaviors and the use of hallucinogens, stimulants, opiates, inhalants and other drugs. The use of inhalant nitrates (poppers), in particular, corroborates other studies which have shown that the use of nitrate inhalants is commonly associated with unprotected anal sex, as this particular drug is primarily used to enhance sexual pleasure and functioning during anal intercourse (Halkitis & Parsons 2002; Binson et al. 2001; Clutterbuck et al. 2001; Colfax et al. 2001; Mattison et al. 2001; Ekstrand et al. 1999).

Moreover, because this sample is one of HIV+ MSM with alcohol use disorders, it is very likely that all of the aforementioned substances were being used by the sample in conjunction with alcohol. Certainly, because the vast majority of participants (73.1%,  $n = 185$ ) not only use alcohol, but also met the DSM-IV criteria for alcohol dependence, the disordered ways in which these MSM were using alcohol is likely to impact the nature and context of their substance use as well. For many of these men, drug use was not as prevalent as alcohol use, and consequently, not as disordered. Perhaps the novelty of this substance use is contributing to higher rates of risky sex, as substances other than alcohol have not been incorporated into the men's lives, and thus these men do not know how to deal with the substances' effects of their bodies, thus impacting decision making processes in regards to condom use.



These findings indicating the positive relationship between drinks per drinking day and increased levels of viral load suggest that special attention should be paid to the immunosuppressant effects of alcohol use for HIV+ MSM. Alcohol may increase viral replication, affecting the immunopathogenic mechanisms of HIV-1 (Bagasra et al. 1996, 1993) and may be a mediating factor in nonadherence to HAART medications. In fact, numerous studies have shown that alcohol consumption impedes the ability of HIV+ persons to adhere to their prescribed medication regimen (Golin et al. 2002; Lucas et al. 2002; Cook et al. 2001). It is hypothesized that alcohol and drug use and abuse both directly and indirectly affect the ability of HIV+ people to maintain their medication regimens.

The results of the current study should be viewed in light of the fact that the data are both self-reported and cross-sectional. As a result, causal implications should not be inferred and longitudinal studies are needed to determine causative relationships. Self-reported data are subject to response bias, and it is possible that some of the HIV+ MSM in this sample underreported unprotected sex behaviors with known HIV- men, due to social stigma issues. We did, however, assess sexual behaviors by partner serostatus, which represents an improvement over many previous studies of the sexual risk behaviors of HIV+ individuals. An additional limitation of the study is that a convenience sample was utilized, although substantial efforts were made to recruit a diverse sample of HIV+ MSM with alcohol use disorders from a variety of community-based venues in order to obtain a sample that was more representative. In addition, data were collected from a major metropolitan area and it is unclear if similar results would emerge from samples obtained in other geographic areas.

The lack of a significant relationship between alcohol use and unsafe sexual practices should be considered in light of the fact that none of the participants in this study were recreational drinkers. It is likely that alcohol use and abuse has become a part of their lives in such a way as to minimize effects on sexual practices. That is, men who reported unsafe sex had this kind of sex regardless of whether or not they had been drinking; those who were consistently using condoms were able to do so whether or not they were intoxicated. It is the other drug use, however, that was related to the unsafe sex. It is likely that providers who work with HIV+ alcohol abusers will focus almost exclusively on the potential impact of alcohol use on their lives. These data, however, suggest that is equally important to consider the recreational drug use among HIV+ MSM who abuse alcohol, as this may be the significant risk factor for HIV transmission.

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TABLE 1

## Characteristics of Study Participants (N = 253)

	N	%
Race/ethnicity		
African American	138	54.5%
Latino/Hispanic	54	21.3%
White	45	17.8%
Other	16	6.3%
Sexual orientation		
Gay/homosexual	185	73.1%
Bisexual	63	24.9%
Straight/heterosexual	3	1.2%
Other/unsure	2	0.8%
Educational Level		
Eighth grade or Less	4	1.6%
Some high school	32	12.6%
Graduated high school/ged	78	30.8%
Some college	79	31.2%
Bachelor's degree	46	18.2%
Post-graduate degree	13	5.2%
Employment		
Full-time	46	18.2%
Part-time/odd jobs	50	19.7%
Student	8	3.2%
Military service	5	2.0%
Disabled	59	23.3%
Unemployed	23	9.1%
Institutionalized (jail, hospital)	6	2.4%
Previous time incarcerated		
None	166	65.6%
1 to 6 months	30	11.9%
6 to 12 months	17	6.7%
1 to 5 years	21	8.3%
6 to 10 years	14	5.5%
10+ years	5	2.0%
Number of times treated for alcohol abuse		
0 times	118	46.6%
1 to 3 times	84	33.2%
4 to 9 times	30	11.9%
10 to 15 times	13	5.1%
16 to 30 times	4	1.6%
Number of times treated for drug abuse		
0 times	135	53.4%
1 to 3 times	76	30.0%
4 to 9 times	26	10.3%
10 to 15 times	10	4.0%
16 to 30 times	2	0.8%

TABLE 2

## Characteristics of Substance Use in the Last 30 Days

	N (%)	Mean (SD) Days Used
Marijuana	126 (49.8)	5.72 (9.26)
Cocaine	77 (30.4)	1.12 (2.56)
Crack	58 (22.9)	3.50 (6.64)
Inhalants	45 (17.8)	1.18 (3.82)
Sedatives	18 (7.1)	1.12 (5.21)
Hallucinogens	12 (4.7)	0.07 (0.40)
Opiates	12 (4.7)	0.41 (2.94)
Other drugs (i.e. Ecstasy, GHB, Ketamine)	11 (4.3)	0.61 (3.78)
Stimulants	10 (4.0)	0.09 (0.49)

TABLE 3

## Sexual Behaviors of Study Participants

	Main or Primary Partners Only (n = 38) N (%)	Casual Partners (n = 203) N (%)
UAI with my partner	22 (57.9)	122 (60.0)
UAI with HXV + partner	12 (31.6)	87 (42.9)
UAI with HIV- partner	9 (23.7)	39 (19.2)
UAI with unknown partner	1 (2.6)	102 (50.2)
UAR with any partner	25 (65.8)	102 (50.3)
UAR with HIV + partner	13 (34.2)	69 (33.9)
UAR with HIV- partner	11 (28.9)	35 (17.2)
UAR with unknown partner	1 (2.6)	91 (44.8)