Problem drinking is associated with increased prevalence of sexual risk behaviors among men who have sex with men (MSM) in Lima, Peru

Robert G. Deiss [a,*], Jesse L. Clark [b], Kelika A. Konda [b], Segundo R. Leon [c], Jeffrey D. Klausner [b], Carlos F. Caceres [d], Thomas J. Coates [b]

[a] Division of Infectious Diseases, Harbor-UCLA Medical Center, Torrance, CA, USA
[b] David Geffen School of Medicine at UCLA, Department of Medicine, Infectious Diseases/Program in Global Health, Los Angeles, CA, USA
[c] Laboratory of Sexual Health, LID, Cayetano Heredia University School of Sciences, Av. Honorio Delgado 430, SMP, Lima 31, Peru
[d] Unit of Health, Sexuality and Human Development, Cayetano Heredia University School of Public Health, Av. Armendáriz 445, Miraflores, Lima 18, Peru

ARTICLE INFO

ABSTRACT

Background: Alcohol use is an important but understudied HIV risk factor among men who have sex with men (MSM), particularly in Latin America. We studied the relationship between problem drinking and sexual risk among MSM in Lima, Peru.
Methods: We recruited 718 participants from 24 neighborhoods for a study on sexually transmitted infections and community-building among MSM. Multivariate analysis was used to identify factors independently associated with problem drinking, which was defined via the CAGE Questionnaire.
Results: Of 718 participants, 58% met criteria for problem drinking. In univariate analysis, problem drinkers were significantly more likely to report failing to always use condoms, use alcohol or drugs prior to their most recent sexual encounter, report a history of sexual coercion and to engage in transactional sex. Problem drinkers also reported significantly higher numbers of recent and lifetime sexual partners. In multivariate analysis, factors independently associated with problem drinking included a history of sexual coercion [OR 1.8 95%, CI 1.2–2.6], having consumed alcohol prior to the most recent sexual encounter [OR 2.1 95%, CI 1.5–2.9], receiving compensation for sex in the last six months [OR 1.6, 95% CI 1.1–2.2] or having reported a prior HIV+ test [OR 0.5, 95% CI 0.2–0.9].
Discussion: We found a high prevalence of problem drinking among MSM in Lima, Peru, which was associated with increased sexual risk in our study. Of note, individuals who were already HIV-infected were less likely to be problem drinkers. Further studies and targeted interventions to reduce problem drinking among MSM are warranted.

© 2013 Published by Elsevier Ireland Ltd.

1. Introduction

The association between alcohol use and sexual risk behavior is well-known, and many recent studies have sought to delineate this relationship (Cook and Clark, 2005; Weinhardt and Carey, 2000). As a psychogenic substance, alcohol increases risk behavior through impairment of decision-making, disinhibition of personality characteristics and alteration of expectations with respect to sexual encounters (Cook and Clark, 2005). Among men in sub-Saharan Africa, qualitative research has shown that alcohol is frequently consumed with an expectation of casual sex and increased arousal (Woolf-King and Maisto, 2011). Thus, it is not surprising that alcohol has been associated with HIV infection, particularly among high-risk populations where alcohol use may be higher.

This association may be even more relevant in developing countries, where both prevalence of HIV/STI infection and alcohol consumption are high (Hahn et al., 2011). A large body of evidence in Africa has demonstrated a relationship between HIV infection, sexual risk behavior and alcohol use. Several cross-sectional studies have found frequent alcohol use to be associated with HIV infection, (Allen et al., 1992; Clift et al., 2003; Fisher et al., 2008; Fritz et al., 2002) and two longitudinal studies have found frequent drinking to be associated with acquisition of HSV-2 (Tassiopoulos et al., 2007; Yadav et al., 2005), a known co-factor for HIV transmission. More commonly, cross-sectional studies have found associations with sexual risk behaviors, including infrequent condom use (Fritz et al., 2002; Geibel et al., 2008; Kalichman et al., 2006; Lane et al., 2008; Simbayi et al., 2006, 2004), multiple/casual partners (Alemu et al., 2007; Bing et al., 2008; Fisher et al., 2008; Kalichman et al.,

* Corresponding author at: Division of Infectious Diseases, Harbor-UCLA Medical Center, 1000 W Carson Street, Box 466, Los Angeles, CA 90502, USA. Tel.: +1 310 222 2366x1; fax: +1 310 533 0447.
  E-mail address: rdeiss@dhs.lacounty.gov (R.G. Deiss).

2006; Mnyika et al., 1997; Simbayi et al., 2006, 2004; Weiser et al., 2006), transactional sex (Dunkle et al., 2007; Fisher et al., 2008; Kalichman et al., 2006; Simbayi et al., 2006, 2004) and sexual coercion (Abrahams et al., 2004; Simbayi et al., 2006; van der Stratan et al., 1998). Most of these studies have involved heterosexual men and women, though similar patterns of alcohol-mediated sexual risk-taking have been observed among men who have sex with men (MSM; Geibel et al., 2008; Lane et al., 2008).

Few studies of alcohol use and sexual risk behavior have taken place in Latin America, despite evidence of widespread alcohol consumption and increasing prevalence of HIV and other sexually transmitted infections (STIs). According to the World Health Organization, the prevalence of alcohol abuse in Peru is increasing, with 7.7% of men classified as having alcohol use disorders and 7.0% being heavy episodic drinkers (WHO, 2011). Among specific populations, problematic drinking may be even higher. A 2007 national survey found that 22% of men in rural Lima abused or were dependent on alcohol (INSM, 2008). Elsewhere, in two studies of Lima shantytowns ("distritos emergentes"), Galvez-Buccollini et al. (2009a) found that 31% of men reported heavy episodic drinking, and 33% of men were "hazardous drinkers" as defined by the Alcohol Use Disorder Identification Test (AUDIT; Galvez-Buccollini et al., 2009b). Elsewhere, alcoholism (defined by the *Prueba de Alcoholismo Latinoamericano Version Larga*) and sexual orientation were independently associated with HIV infection in a case control study (Chincha et al., 2008), though problem drinking among MSM remains underexplored.

The relationship between sexual risk behavior and problem drinking is of particular importance in Peru given the high prevalence of both among MSM. The overall prevalence of HIV infection in Peru is 0.4%, though it is highly concentrated among MSM with an estimated prevalence of 10.9% (UNAIDS, 2012). High prevalence of other STIs, particularly genital herpes, gonorrhea and syphilis have been found among MSM in a number of studies (Clark et al., 2008; Lama et al., 2006; Sanchez et al., 2009). In addition, sexual risk behaviors, including inconsistent condom use, sex exchange and sex with multiple casual partners appear to be common among MSM (Clark et al., 2007; Sanchez et al., 1996). In Peru, consumption of alcohol before sex is a common practice and has been reported among heterosexual and heterosexually-identifying men (Konda et al., 2011; Maguiña et al., 2012; Sanchez et al., 1996), though systematic analyses of problem drinking among MSM have been lacking.

The use of standardized measures for alcohol consumption offers several advantages in defining the relationship between sexual risk and problem drinking. Studies examining the relationship between sexual risk and alcohol use have typically described any use, frequency of use or intoxication during sexual encounters, and therefore it has been difficult to draw conclusions surrounding this relationship (Leigh and Stall, 1993). The CAGE questionnaire (Ewing, 1984) has been used in studies of adherence and HIV disease progression and allows researchers to identify individual-level characteristics that define alcohol use and dependence (Samet et al., 2004, 2010). For this reason, we sought to further explore the association between alcohol and sexual risk behavior among MSM in Peru. We hypothesized that individuals with higher rates of alcohol consumption would also demonstrate higher incidence of sexual risk behaviors and sexually transmitted infections.

2. Methods

The current study is a sub-analysis of data from the baseline survey of the *Comunidades Positivas* (Positive Communities and Enhanced Partner Therapy in Peru), or CPOS study (Martinez et al., 2010). Participants in the city of Lima and surrounding areas were recruited from 16 low-income neighborhoods between March and May, 2008, and in eight additional neighborhoods between September and December, 2009 via venue-based sampling. Potential recruitment sites were identified through ethnographic methods previously employed by our study group to identify social networks and common meeting places among MSM and transgendered persons (TGP). Eligible study participants included biological males aged 18–45 who reported at least one sexual encounter with a male or transgender partner in the past 12 months, acknowledged sexual preference toward other men or TGP, lived or worked near the intervention area, planned to stay in the intervention area for the whole study period (18 months) and were willing to consent to study participation.

2.1. Data collection

Storefronts or other local spaces were utilized to conduct interviews, collect specimens and dispense treatments. All participants completed a behavioral survey which was administered via Computer-Assisted Personal Interviewing (CAPI), except for questions pertaining to HIV history where Audio Computer-Assisted Self-Interviewing (ACASI) was used to avoid reporting bias due to fears of stigma among HIV positive participants. Variables assessed in the interview included demographic characteristics, general health and health care seeking behavior, HIV testing history/status, sexual risk behaviors (including detailed questions on the last three sex partners) and substance use. We also asked questions pertaining to frequency of alcohol use and episodes of heavy drinking, along with the questions which comprise the formal CAGE questionnaire (Ewing, 1984).

All participants underwent pre-test counseling for HIV infection and STIs including syphilis, HSV-2, chlamydia and gonorrhea. Participants were treated for symptomatic STIs at the time of the initial visit. A 10 ml blood sample was collected from each participant, along with pharyngeal swabs and self-obtained rectal swab samples. Participants returned for STI and HIV results within two weeks of this initial visit and received post-test counseling and treatment for asymptomatic bacterial STIs. Newly diagnosed HIV infection cases were referred to the National HIV Antiretroviral Treatment Program, where treatment is provided free of charge.

HIV serologic status was determined with EIA and Western Blot confirmation (BIO-RAD Laboratories, Redmond, WA). HSV-2 antibody status was determined by HerpeSelect 2 ELISA IgG (Focus Diagnostics, Cypress, CA), with levels of 3.5 or greater indicating seropositivity. Syphilis infection, defined as a titer > 1:8, was determined by the rapid plasma reagin (RPR) test (BioMerieux, Boxtel, Netherlands), followed by TP-PA confirmation (Fujirebio, Japan). Oral and rectal swabs were evaluated for *C. trachomatis* and *N. gonorrhoeae* (GenProbe, San Diego, CA). For quality control purposes, 10% of all samples other than syphilis tests were sent to the San Francisco Department of Public Health Laboratory for confirmatory testing. Quality control tests for syphilis infection were performed at the Naval Medical Research Unit-6 Bacteriology Laboratory in Lima, Peru.

2.2. Data analysis

Problem drinking (the main outcome variable) was defined using the CAGE questionnaire with a positive screen meeting at least two of the following four criteria: attempts to reduce drinking, morning drinking, criticism by others or feelings of guilt over drinking (all over the past 12 months). An alpha statistic was calculated from our data sample using the four questions which comprised the CAGE questionnaire ($\alpha = 0.76$). Univariate logistic regression and nonparametric tests were used to compare problem drinkers (CAGE-positive) with others. Dichotomous and continuous variables were compared using the Pearson χ^2 and Mann–Whitney test, respectively. Two-sided P values < 0.05 were considered statistically significant. Variables pertaining to sexual risk, demographics and health-related factors with P values below 0.10 were included in a multivariate logistic regression model, with problem drinking as the dependent variable.

Our regression model did not include variables relating to frequency of alcohol use, as these captured data similar to our dependent variable. We did include alcohol use immediately prior to a participant's most recent sexual encounter into the model, as this was event-specific and related to sexual risk. In addition, we included only a single variable to account for number of partners as all measures of total partners were highly correlated. Missing data was coded as such, with frequencies of unusable data calculated for every variable to determine if it affected the validity of the data. To diminish recall bias, we chose number of partners in the last three months as the best measure of the frequency of sexual encounters. Likelihood ratio tests were used to compare nested models, and we also checked for significant two-way interactions and performed Hosmer–Lemeshow goodness-of-fit tests (Hosmer, 2000). Finally, in order to test the association between problem drinking and sexual risk factors, we conducted exploratory analyses with CAGE-positivity and alcohol consumption as independent variables, and unprotected anal intercourse as a dependent variable.

3. Results

A total of 718 participants met inclusion criteria and were recruited to participate in the study. Selected demographic characteristics are available in Table 1. Of all participants, 58% met