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Alcohol misuse, risky sexual behaviors, and HIV or syphilis infections among Chinese men who have sex with men

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ABSTRACT

Background: Few studies have employed standardized alcohol misuse measures to assess relationships with sexual risk and HIV/syphilis infections among Chinese men who have sex with men (MSM).
Methods: We conducted a cross-sectional study among MSM in Beijing during 2013–2014. An interviewer-administered survey was conducted to collect data on sociodemographics, high-risk behaviors, and alcohol use/misuse patterns (hazardous/binge drinking and risk of alcohol dependence) in the past 3 months using Alcohol Use Disorder Identification Test-Consumption (AUDIT-C). We defined AUDIT-C score ≥4 as recent hazardous drinkers, and drinking ≥6 standard drinks on one occasion as recent binge drinkers.
Results: Of 3588 participants, 14.4% reported hazardous drinking, 16.8% reported binge drinking. Hazardous and binge drinking are both associated with these factors ($p < 0.05$): older age, being migrants, living longer in Beijing, township/village origin, being employed, higher income, self-perceived low/no HIV risk, and sex-finding via non-Internet venues. Hazardous (vs non-hazardous) or binge (vs. non-binge) drinkers were more likely to use illicit drugs, use alcohol before sex, have multiple partnerships, pay for sex, and have condomless insertive anal intercourse. MSM who reported binge (AOR, 1.34, 95% CI, 1.02–1.77) or hazardous (AOR, 1.36, 95% CI, 1.02–1.82) drinking were more likely to be HIV-infected. MSM at high risk of current alcohol dependence (AUDIT-C ≥8) were more likely to be HIV- (AOR, 2.37, 95% CI, 1.39–4.04) or syphilis-infected (AOR, 1.96, 95% CI, 1.01–3.86).
Conclusions: Recent alcohol misuse was associated with increased sexual and HIV/syphilis risks among Chinese MSM, emphasizing the needs of implementing alcohol risk reduction programs in this population.

1. Introduction

HIV transmission patterns in China have evolved since the initial HIV outbreak in Yunnan Province in 1989 (Zhang et al., 2013), followed by a large epidemic among plasma donors in central China in the early 1990s (Qian et al., 2006), and then wide-spread transmission across the country through sexual contact (Qian et al., 2005). The countrywide scale-up of harm-reduction programs for persons who inject drugs and law enforcement campaigns on banning illegal plasma collection has significantly decreased and stabilized the HIV epidemic among both drug injectors and plasma donors (Shan et al., 2002; Suguimoto et al., 2014; Wu et al., 2007). In contrast, the proportion of new HIV cases due to sexual transmission increased from 33.1% in 2006 to 92.2% in 2014, during which male-to-male sexual transmission surged from 2.5% to 25.8% (Ministry of Health of the People's Republic of China AIDS Response Progress Report, 2015). A recent meta-analysis of 84 studies (January, 2009–April, 2014) showed that the pooled HIV prevalence among Chinese men who have sex with men (MSM) was 6.5% (Zhou et al., 2014), which was much higher than 0.037% in the general population (Ministry

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of Health of the People's Republic of China AIDS Response Progress Report, 2015). Without effective prevention interventions, the HIV prevalence among Chinese MSM in Beijing may escalate to 21.4% in 2020 (Lou et al., 2014).

Alcohol is widely consumed worldwide as a beverage and for recreation and socialization (Ennett et al., 2016). Very modest alcohol consumption may help reduce morbidity and mortality from several chronic diseases (Walzem, 2008). However, excessive alcohol use and chronic alcohol binging are associated with high morbidity and mortality (Stockings et al., 2016). Relevant to risk of sexually transmitted infections, the psychogenic nature of alcohol may interfere with one's cognitive control and decreasing risk perception, in turn resulting in disinhibition and increasing the likelihood of risky sexual behavior (Rehm et al., 2012; Sales et al., 2012).

In China, overall alcohol consumption as well as high-risk drinking among the general population have increased dramatically since the late 1990s (He et al., 2015; Tang et al., 2013). A recent national survey indicated higher prevalence of alcohol drinking among men (55.6%) than women (15.0%; Li et al., 2011b). Alcohol consumption has also been increasing steadily among Chinese MSM, and reported to be associated with elevated risks of HIV and sexually transmitted infections (Liu et al., 2014). A recent study among Chinese MSM showed that the 12-month prevalence of alcohol use was 58% (Lu et al., 2013a). Psychological stress and its related body's response is considered as one of the major contributors of alcohol and illicit drug use initiation and continuation (Brady and Sonne, 1999). Since homosexuality is culturally dissonant with mainstream Chinese attitudes, the perceived/enacted stigma and social discrimination or isolation may result in psychological burden such as depression, anxiety, and low self-esteem among MSM (Dyer et al., 2013; Liu et al., 2016a; Yu et al., 2013a). Multiple studies have demonstrated the associations of these psychological issues with increased alcohol use and HIV-related risk behaviors among MSM (Carrico et al., 2012; Chen et al., 2012; Dyer et al., 2013). In the meantime, problematic alcohol drinking is also prevalent among Chinese MSM, and is significantly associated with illicit drug use, alcohol use before sex, having condomless sex, and multiple concurrent sexual partnerships (Fan et al., 2016; Liu et al., 2014; Lu et al., 2013a). The synergism of the disinhibited effect of alcohol misuse and high-risk sexual profiles of Chinese MSM may play an important role in exacerbating HIV/STI transmission in this population.

Research on alcohol use and misuse patterns and sexual risk-taking among Chinese MSM is scarce (Lu et al., 2013a). Few studies have employed standardized alcohol screening surveys to quantify problematic drinking and relate it to sexual risk taking, and HIV/syphilis risk (Fan et al., 2016). Using the well-validated Alcohol Use Disorders Identification Test-Consumption (AUDIT-C), we assessed the sociodemographic predictors of recent alcohol misuse and evaluated the association of different alcohol misuse patterns with risky behaviors and HIV/syphilis infection among a large sample who were HIV-negative or status-unknown MSM in Beijing, China.

2. Materials and methods

2.1. Study design and participants

This study was based on the cross-sectional baseline survey of a randomized controlled trial entitled "Multi-component HIV Intervention Packages for Chinese MSM—Test, Link and Care" (China-MP3 Project). The details of the parent trial are described elsewhere (Liu et al., 2016b,c). In short, 3760 HIV-negative and status-unknown MSM were recruited in Phase I for a baseline survey and HIV and syphilis testing via short message service, website advertisement, gay-frequented venues outreach, peer referral, and self-participation. Inclusion criteria for Phase I comprised: men or transgender women who self-reported having sex with another man in the past 12 months, ≥18 years old, currently living in Beijing, being HIV-negative or status-unknown, having not previously participated in this study, and able/willing to provide written informed consent. Eligible participants were invited to complete a survey and have blood drawn for HIV and syphilis testing in our collaborated HIV voluntary counselling and testing clinics. The study protocol was approved by the institutional review boards of Vanderbilt University and the National Center for AIDS/STD Control and Prevention (NCAIDS) of Chinese Center for Disease Control and Prevention (China CDC).

2.2. Data collection and measures

An interviewer-administered survey was conducted among participants to collect data on sociodemographic characteristics, including: age, ethnicity, education, employment, marital status, monthly income, household registration status in Beijing (*Hukou*), residence of origin, venue of sex-finding, self-perception of HIV risk, and duration of living in Beijing. The survey also assessed recent (i.e., 3 months prior to the survey) HIV-related risk behaviors, including illicit drug use (intake of any of these illicit drugs: methamphetamine, MDMA, rush, magu, ketamine, cannabis/marijuana, cocaine, opium, heroin, morphine in past 3 months prior to the survey), alcohol use before sex, multiple concurrent partnerships, commercial sex (pay money for sex from a male sex worker), condomless insertive anal intercourse [CIAI] and condomless receptive anal intercourse [CRAI].

The Alcohol Use Disorders Identification Test (AUDIT) is a 10-item standardized screening instrument developed by World Health Organization (WHO) for identifying multiple alcohol drinking problems (Saunders et al., 1993). The Alcohol Use Disorders Identification Test-Consumption (AUDIT-C) contains the first 3 items of the full AUDIT that address alcohol consumption, with scores ranging from 0 to 12 points, and has been demonstrated its effectiveness in screening for hazardous/harmful alcohol drinking and potential alcohol abuse/dependence (Bradley et al., 2003; Bush et al., 1998; Rubinsky et al., 2010). Both the AUDIT and the AUDIT-C have been widely used in clinical and primary care settings worldwide for a variety of alcohol misuse assessments (Seth et al., 2015), and have also been validated in China (Li et al., 2011a) and among Chinese MSM (Fan et al., 2016; Lu et al., 2013a). In this study, AUDIT-C (see Table 1 for details) was used to measure recent problematic alcohol drinking, as in one study it demonstrated better sensitivity and specificity in measuring problematic alcohol drinking than the full AUDIT scale among Chinese MSM (Lu et al., 2013a). We employed four alcohol use classifications in the current analysis. First, we dichotomized participants into recent drinkers (AUDIT-C ≥1) vs. non-drinkers (AUDIT-C = 0). Second, we used an AUDIT-C score of ≥4 to classify participants as recent hazardous drinkers (vs. non-hazardous drinkers with AUDIT-C <4; Bush et al., 1998). Third, we used item-3 of the AUDIT-C to classify participants who reported any episode of drinking 6 or more standard drinks on one occasion in the past 3 months as recent binge drinkers (vs. non-binge drinkers; Lu et al., 2013a). Participants were informed that a standard drink is defined as any drink that contains about 10 g of pure alcohol (50 ml of spirits; or 40 ml [one small cup] of rice wine; or one can of beer; or 140 ml [one cup] of red wine). Lastly, the bivariate categories (AUDIT-C <4 vs. ≥4) were further enhanced by four-category measurement of the risk of current alcohol dependence: non-drinker (AUDIT-C score = 0), low risk (AUDIT-C score = 1–3), moderate risk (AUDIT-C score = 4–7)