Drinking trajectories among HIV-infected men who have sex with men: A cohort study of United States veterans[☆]

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ARTICLE INFO

ABSTRACT

Background: Although high rates of alcohol consumption and related problems have been observed among HIV-infected men who have sex with men (MSM), little is known about the long-term patterns of and factors associated with hazardous alcohol use in this population. We sought to identify alcohol use trajectories and correlates of hazardous alcohol use among HIV-infected MSM.

Methods: Sexually active, HIV-infected MSM participating in the Veterans Aging Cohort Study were eligible for inclusion. Participants were recruited from VA infectious disease clinics in Atlanta, Baltimore, New York, Houston, Los Angeles, Pittsburgh, and Washington, DC. Data from annual self-reported assessments and group-based trajectory models were used to identify distinct alcohol use trajectories over an eight-year study period (2002–2010). We then used generalized estimate equations (GEE) to examine longitudinal correlates of hazardous alcohol use (defined as an AUDIT-C score ≥ 4).

Results: Among 1065 participants, the mean age was 45.5 (SD = 9.2) and 606 (58.2%) were African American. Baseline hazardous alcohol use was reported by 309 (29.3%). Group-based trajectory modeling revealed a distinct group (12.5% of the sample) with consistently hazardous alcohol use, characterized by a mean AUDIT-C score of >5 at every time point. In a GEE-based multivariable model, hazardous alcohol use was associated with earning <$6000 annually, having an alcohol-related diagnosis, using cannabis, and using cocaine.

Conclusions: More than 1 in 10 HIV-infected MSM US veterans reported consistent, long-term hazardous alcohol use. Financial insecurity and concurrent substance use were predictors of consistently hazardous alcohol use, and may be modifiable targets for intervention.

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1. Introduction

Frequent alcohol use and heavy episodic drinking are common among gay, bisexual, and other men who have sex with men (MSM; Stall et al., 2001; Thiede et al., 2003). Findings from some nationally representative surveys suggest that MSM use alcohol more frequently than heterosexual men (Cochran et al., 2000; Dermody et al., 2014). Hazardous alcohol consumption (drinking that is associated with risk for alcohol problems) is a particular concern among MSM living with HIV, and is associated with poorer HIV treatment outcomes (Woolf-King et al., 2014). A recently published study of HIV-infected MSM in primary care found that hazardous alcohol use was associated with having a detectable viral load (Skeer et al., 2012a). Moreover, hazardous alcohol use is an established predictor of sexual risk behavior with HIV-negative or unknown status partners among HIV-positive MSM (Bruce et al., 2013; Parsons et al., 2005; Purcell et al., 2001). Among HIV positive persons generally, the sequelae of long-term hazardous alcohol use includes a range of adverse health outcomes, including medical and psychiatric comorbidities (Freiberg and Kraemer, 2010; Lim et al., 2014; Sullivan et al., 2011), liver disease (Salmon-Ceron et al., 2005), and poorer immune status (Skeer et al., 2012b).

Despite the individual and public health consequences related to alcohol use among HIV-infected MSM, few longitudinal studies have examined how patterns of drinking may change over time. The identification of distinct alcohol use "trajectories" (i.e., well-defined sub-groups of people who follow similar patterns of alcohol consumption over time) has a number of important public health implications. Such methods could improve the predictive capacity of screening tools to identify individuals at high risk of continued hazardous alcohol use, and may also result in better understanding of the adverse health outcomes associated with consistent, long-term hazardous alcohol use (compared to episodic hazardous drinking). The determination of hazardous drinking trajectories may also be useful for developing and focusing more intensive pharmacological and non-pharmacological treatment for sub-groups of HIV-infected MSM at greatest risk of alcohol problems. Research to date has primarily focused on drinking trajectories during critical developmental periods of adolescence to emerging adulthood (Chassin et al., 2002; Hatzenbuehler et al., 2008; Marshal et al., 2009). Much less is known about alcohol use trajectories among adult MSM, particularly those living with HIV.

Not only are the longitudinal patterns of alcohol use in HIV-infected MSM poorly understood, the predictors of distinct alcohol use trajectories have not been well examined. However, in military populations, depression and posttraumatic stress disorder (PTSD) have been identified as key risk factors for the development and acceleration of alcohol-related problems (Jacobson et al., 2008; Marshall et al., 2012; Seal et al., 2011). A recent study observed significantly higher rates of hazardous alcohol use among gay and bisexual veterans compared to heterosexual males, as well as an increased prevalence of concurrent PTSD symptomatology and depression (Cochran et al., 2013). Further research is required to inform alcohol-focused prevention and risk reductions interventions for the over one million sexual minority veterans in the United States (Gates, 2004), including those who are HIV-infected.

The primary objective of this study was to identify long-term alcohol drinking trajectories among HIV-infected, sexually active MSM in a prospective cohort of veterans engaged in care in the United States. Additionally, we sought to examine the sociodemographic, behavioral, and clinical correlates of hazardous alcohol use in order to identify modifiable factors that may improve alcohol treatment interventions for this population.

2. Material and methods

2.1. Study design and data sources

The primary objectives, design, and methods of the Veterans Aging Cohort Study (VACS) have been described elsewhere (Conigliaro et al., 2004; Justice et al., 2006, 2001). This study utilizes data from the eight-site VACS, which enrolled HIV-infected participants receiving medical care at Veterans Health Administration (VHA) facilities in: Atlanta, Georgia; Baltimore, Maryland; Bronx, New York; Houston, Texas; Los Angeles, California; Manhattan, New York; Pittsburgh, Pennsylvania; and Washington, D.C. from 2002 to 2010 (Justice et al., 2006). At each assessment scheduled approximately annually (six waves of data collection in total), participants completed a comprehensive questionnaire, which solicits information regarding sociodemographic characteristics, general health status, health conditions, alcohol and substance use, sexual activity, and other behaviors. In addition to self-reported survey data, VACS extracted and linked information from electronic medical records, including diagnoses recorded using the International Classification of Diseases, Ninth Revision (ICD-9) codes (Centers for Disease Control and Prevention, 2013). The VACS was approved by the institutional review boards at each participating VHA Medical Center and affiliated academic institutions.

2.2. Study sample

All HIV-infected male participants enrolled between June 1st, 2002 and September 30th, 2010 were eligible for inclusion. Of the 3537 potentially eligible participants, we excluded 1390 (39.3%) who reported sex with females only at baseline, 943 (26.7%) who reported no recent sexual activity in the past year, and 99 (2.8%) who refused to answer the sexual activity questions. We also excluded 40 (1.1%) who reported never consuming an alcoholic drink in their lifetime. The final baseline analytic sample was 1065 sexually active, HIV-infected MSM. In all analyses (see below), we defined lost to follow-up as never returning to complete a follow-up assessment during the study period (i.e., date of recruitment until November 1st, 2011).

2.3. Measures

The primary outcomes for these analyses were scores on the Alcohol Use Disorders Identification Test-Consumption (AUDIT-C) questionnaire (Bush et al., 1998). This screening test evaluates three measures of alcohol consumption, including frequency of alcohol use, quantity of alcohol consumed, and heavy episodic drinking (consumption of ≥ 6 drinks on ≥ 1 occasion) during the past year. The AUDIT-C has been found to be a reliable and valid screening instrument to assess risk of hazardous or harmful alcohol use among veterans (Bradley et al., 2003; Bush et al., 1998), including those enrolled in the VACS (McGinnis et al., 2013). The AUDIT-C was administered at baseline and at follow-up: in this longitudinal study, scores from all available assessments were examined. To be consistent with previous studies (Bradley et al., 2007; Saitz, 2005), we defined hazardous alcohol use dichotomously as a score of ≥ 4 on the AUDIT-C.

We examined sociodemographic, behavioral, and clinical variables as correlates of hazardous alcohol use. These independent variables were chosen based on a priori hypotheses that were informed by previous studies examining factors associated with unhealthy alcohol use in male veterans and MSM (Cochran et al., 2013; Jakupcak et al., 2010; Kraemer et al., 2006; Stall et al., 2001; Sullivan et al., 2011; Wong et al., 2008). Sociodemographic self-reported variables included: age (in years); education (some college or greater, high school or less); race (African American, white, other); ethnicity (Hispanic/Latino, not Hispanic/Latino); marital status (married or living with partner, divorced/separated/widowed, never married); employment status (employed for wages or self-employed, unemployed/student/retired/unable to work/other); annual household income (<$6000, $6000–$11,999, $12,000–$24,999, $25,000–$49,999, $\geq$50,000); and ever homeless (yes, no). Behavioral self-reported variables referred to activities in the past year, and included: type of sex partner(s) (males only, males and females); cannabis use (yes, no); cocaine use (yes, no); and other stimulant use (yes, no), including amphetamines, speed, and crystal methamphetamine. Clinical variables assessed included: depressive symptomatology, measured using the Patient Health Questionnaire (PHQ-9) (Kroenke et al., 2001); baseline hepatitis C virus (HCV) status (positive, negative), defined as a positive HCV antibody test or an ICD-9 code for this diagnosis; and past year receipt of VHA outpatient services for substance abuse treatment (yes, no), defined using substance use disorder-specific outpatient clinic "stop codes" (i.e., unique identifiers for all inpatient and outpatient care services received in the VHA; Harris et al., 2010). Finally, we used ICD-9 codes to define diagnoses for the following conditions, recorded between 12 months prior to VACS enrollment and the end of each participant's follow-up: alcohol-related diagnosis (yes, no), defined by ICD-9 codes 291.x, 303.x, and 305.0x; drug-related diagnosis (yes, no), defined by ICD-9 codes 292.x and 305.2–305.9; major depressive disorder diagnosis (yes, no), defined by ICD-9 codes 296.2x; and posttraumatic stress disorder (PTSD) (yes, no), defined by ICD-9 code 309.81.