Drug and Alcohol Dependence 134 (2014) 151–157

Contents lists available at ScienceDirect

Drug and Alcohol Dependence

journal homepage: www.elsevier.com/locate/drugalcdep

Self-reported alcohol abstinence associated with ART initiation among HIV-infected persons in rural Uganda

Glenn-Milo Santos[a,b], Nneka I. Emenyonu[a], Francis Bajunirwe[c], A. Rain Mocello[a], Jeffrey N. Martin[a], Eric Vittinghoff[a], David R. Bangsberg[d], Judith A. Hahn[a,*]

[a] University of California, San Francisco, United States
[b] San Francisco Department of Public Health, United States
[c] Mbarara University of Science and Technology, Uganda
[d] Massachusetts General Hospital, United States

ARTICLE INFO

Article history:
Received 23 July 2013
Received in revised form
24 September 2013
Accepted 25 September 2013
Available online 5 October 2013

Keywords:
Alcohol
HIV
Alcohol abstinence
Hazardous drinking
ART-initiation
Antiretroviral treatment
Uganda
Africa

ABSTRACT

Background: There is limited data on the impact of anti-retroviral treatment (ART) initiation on alcohol consumption. We characterized predictors of abstaining from alcohol among HIV-infected individuals following ART initiation.
Methods: We analyzed data from a prospective cohort of HIV-infected adults in Mbarara, Uganda with quarterly measures of self-reported alcohol consumption, socio-demographics, health status, and blood draws. We used pooled logistic regression to evaluate predictors of becoming abstinent from alcohol for at least 90 days after baseline.
Results: Among the 502 participants, 108 (21.5%) were current drinkers who consumed alcohol within 90 days of baseline, 206 (41.0%) were former drinkers, and 188 (37.5%) were lifetime abstainers at baseline. Among current drinkers, 67 (62.0%) drank at hazardous levels. 90 of current drinkers (83.3%) abstained from alcohol at least for 90 days over 3.6 median years of follow-up [IQR 2–4.8]; of those 69 (76.7%) remained abstinent for a median duration of follow-up of 3.25 years [1.6–4.5]. Becoming abstinent was independently associated with lower baseline AUDIT score (adjusted odds ratio [AOR] 0.95 [95%CI 0.91–0.99]), baseline physical health score (AOR 0.92 [0.87–0.97]), and decreases in physical health score at follow-up visits (AOR 0.92 [0.88–0.97]). Alcohol abstinence was most likely to start immediately after ART initiation (AORs for 6 month versus 3 month visit: 0.25 [0.10–0.61]; 9 month visit or later versus 3 month visit: 0.04 [0.02–0.09]).
Conclusions: We found that a large majority of drinkers starting ART reported that they became and remained abstinent from alcohol. ART initiation may be an opportune time to implement interventions for alcohol consumption and other health behaviors.

1. Introduction

In 2010, five and a half percent of the total burden of disease around the world has been attributed to alcohol consumption, which is also causally related to more than 60 chronic and acute health conditions (Lim et al., 2012; Room et al., 2005). Heavy alcohol use, in particular, has been associated with a wide range of societal, economic, and medical consequences (Lee and Forsythe, 2011; Room et al., 2005; Tumwesigye et al., 2012b).

Hazardous alcohol consumption is highly prevalent in sub-Saharan Africa (SSA; World Health Organization, 2011). Per-capita, Uganda has among the highest alcohol consumption in the world (World Health Organization, 2011). One study in primary care clinics in Kampala, Uganda observed a 17% and 10% prevalence of hazardous alcohol consumption and alcohol dependence, respectively (Kullgren et al., 2009). Despite the high prevalence of heavy alcohol use in SSA and in Uganda, interventions to reduce alcohol use are not widespread in this region, particularly outside large urban areas, underscoring a major public health gap (Hahn et al., 2011). Although provision of health education materials and cognitive behavioral therapy may be promising in reducing alcohol consumption among HIV-infected individuals in some settings, scale-up of these programs remain limited (Papas et al., 2011; Peltzer et al., 2013; Pengpid et al., 2013a). Moreover, problem alcohol use is believed to often go undetected in this region; one study

* Corresponding author at: Box 0886, 50 Beale St., 13th Floor 335, University of California, San Francisco, San Francisco, CA 94143-0886, United States.
Tel.: +1 415 597 9213; fax: +1 415 206 4978.
E-mail address: Judy.hahn@ucsf.edu (J.A. Hahn).

0376-8716/$ – see front matter © 2013 Elsevier Ireland Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.drugalcdep.2013.09.025

in primary care settings found that only 7% of drinkers have been asked about their alcohol consumption by their medical providers (Kullgren et al., 2009).

Alcohol use has been associated with increased risk of HIV acquisition and transmission in SSA (Bukenya et al., 2012; Mbulaiteye et al., 2000; Page and Hall, 2009; Seeley et al., 2012; Shuper et al., 2009; Tumwesigye et al., 2012a; Zablotska et al., 2006). There is compelling data linking alcohol consumption and increased sexual risk behaviors—and consequently secondary HIV transmission—in SSA (Kalichman et al., 2007). In addition, alcohol consumption has been associated with delays in detection of HIV-infection, poor HIV health outcomes and sub-optimal HIV care (Fatch et al., 2012; Hahn et al., 2011; Hendershot et al., 2009). Drinking may also play a role in receipt of antiretroviral therapy (ART) and alcohol intoxication may affect ART efficacy through poor adherence or potential changes in metabolism of ART (Martinez et al., 2008; Braithwaite and Bryant, 2010; Hahn and Samet, 2010; Hendershot et al., 2009). Some, though not all, studies have found independent associations between alcohol consumption and HIV disease progression (Hahn and Samet, 2010; Hahn et al., 2011).

However, little is known about the patterns of alcohol use among HIV-infected individuals in SSA. There is also very limited data on the impact of ART initiation on alcohol consumption. One study in Kampala, Uganda, found that ART initiation was associated with a 50% increase in odds of reporting abstinence from alcohol for at least six months among those with HIV (Hahn et al., 2012b). Given the interplay between HIV and alcohol use, it is important to characterize the extent of alcohol consumption, particularly among HIV-infected individuals, in this region. Moreover, identifying HIV-infected persons who do not become abstinent from alcohol can assist with targeting and development of effective interventions to reduce harms associated with alcohol (Hahn et al., 2011). We therefore sought to evaluate alcohol consumption patterns and prospective predictors of self-reported initiation of abstinence from drinking among HIV-infected individuals initiating ART in Mbarara, Uganda.

2. Methods

2.1. Participants and study design

Data from this analysis was collected as part of the Uganda AIDS Rural Treatment Outcomes (UARTO) study, a prospective cohort of HIV-infected individuals initiating ART. Participants were eligible for enrollment in this cohort if they were HIV-infected, ART-naïve, at least 18 years of age and lived within 60 km from the Mbarara Regional Referral Hospital Immune Suppression Syndrome (ISS) Clinic in Mbarara, Uganda. A representative from the study recruited and screened individuals obtaining antiretroviral medication for the first time from the ISS pharmacy for eligibility. All eligible patients who consented to participate were enrolled in the cohort until the target sample size for the study was reached. In quarterly visits, biological specimens were collected, and participants were interviewed face-to-face with standardized questionnaires administered in English or Runyankole by native speakers.

2.2. Measurements

Data on sociodemographic characteristics and quality of life measures, including mental health summary (MHS) and physical health summary (PHS) were collected in interviewer-administered structured questionnaires. MHS and PHS are two of the domains from the Medical Outcomes Study HIV Survey (MOS-HIV)—a measure of health function that has been previously validated in Uganda (Stangl et al., 2007) and has been associated with AIDS-related events (Wu et al., 1997). MHS and PHS scores range between 0 and 100, with higher scores corresponding with better function and quality of life. Self-reported alcohol consumption, including frequency and volume was elicited quarterly. At baseline, the World Health Organization's 10-item Alcohol Use Disorder Identification Test (AUDIT) was administered to assess alcohol consumption from the past 12 months (range: 0–40; Saunders et al., 1993). Hazardous alcohol consumption cut-offs for men and women were scores of eight and five, respectively. These cut-offs were observed to have the most optimal sensitivity and specificity for hazardous drinking among men and women in a population-based study in Finland (Aalto et al., 2009). Blood draws were also conducted at quarterly visits for CD4+ T-cell counts. The procedures for this study were approved by the Committee in Human Research at the University of California at San Francisco, Partners HealthCare, Mbarara University of Science and Technology and the Uganda National Council on Science and Technology.

2.3. Statistical analysis

At baseline, we estimated the proportion of current alcohol drinkers (i.e. those who reported alcohol consumption within the prior 3 months), former alcohol drinkers (i.e. those who reported alcohol consumption over 3 months ago), and lifetime abstainers of alcohol. Among current drinkers at baseline, we fitted a pooled logistic regression (PLR) model to evaluate predictors of time to first becoming abstinent from alcohol for at least 90 days using a complete case analysis. Because the majority of participants reported becoming abstinent at month 3 or 6 visits, time intervals were categorized into 3 groups: (1) month 3 visits (referent), (2) months 6 visits, and (3) months 9 visits or later. PLR is appropriate for outcomes that are interval-censored between visits; furthermore, with the inclusion of the categorical variable for interval in the model, PLR provides estimates of the between-interval differences in the incidence rate for abstinence. We evaluated the relationship between abstaining from drinking and the following: age, sex, education, religion, literacy, and baseline AUDIT score (evaluated as a continuous measure and dichotomized as hazardous vs. non-hazardous). Time-varying predictors of interest were time since ART initiation/baseline visit, MHS score, PHS score, and CD4 cell count. For model-building, we used the algorithm suggested by Hosmer and Lemeshow in which predictors that were statistically significant in the bivariate-level using a p-value cut-off point of 0.25 were included in the larger multivariable model (Bursac et al., 2008). The final multivariable model was arrived at using a step-wise backward procedure; likelihood ratio tests were used to confirm that nested-models fit the data as well as larger models. At year one and two of follow-up, 2% and 5% of UARTO participants were lost to follow-up, respectively. Moreover, 12% of data on alcohol consumption were missing due to missed visits. We therefore conducted multiple imputation using iterative chained equations with STATA 12.1 (College Station, TX) to examine our findings' sensitivity to missing data. For multiple imputation, missing continuous follow-up data on MHS, PHS, and CD4 count were imputed using predictive mean matching while missing binary data on alcohol consumption was imputed using logistic regression; 10 datasets were imputed using demographic (e.g. education, literacy, religion, gender, age) characteristics, AUDIT score, PHS score, MHS score, and CD4 cell count. The 10 imputed datasets were analyzed using STATA mi estimate, which combines dataset-specific results to estimate standard errors, confidence intervals, and p-values that reflect the imputation of missing data via established methods (Schafer, 1999).

3. Results

3.1. Sample characteristics

Among the 502 HIV-infected participants enrolled in the UARTO cohort from June 2005 to May 2011, 108 (21.5%) were current drinkers, 206 (41.0%) were former drinkers, and 188 (37.5%) were lifetime abstainers of alcohol (Fig. 1). The median number of days between baseline alcohol assessment and ART initiation was 1 day (inter-quartile range: 0–2); 96% of participants initiated ART within 15 days of baseline alcohol assessment. Of the current drinkers at baseline, over half were male (51.9%), most were literate (78.7%), and most only had primary education or lower (63.9%; see Table 1). Among current drinkers, 67 (62.0%) were considered hazardous drinker at baseline by past-year AUDIT score (median 9; IQR: 5–15). The median number of drinking days among current drinkers was 3.5 (IQR: 1–10) and the majority reported drinking less than 5 drinks on a typical drinking day (68.5% had 1 or 2 drinks, 17.6% had 3 or 4). Many have felt guilty about their drinking (37.0%) or the need to cut down on their alcohol consumption (49.1%).

3.2. Longitudinal analysis

Analyses of becoming abstinent from alcohol were restricted to 108 current drinkers at baseline, who contributed 167.75 person-years of follow-up, with a median follow-up time of 3.6 median years of follow-up [IQR: 2–4.8]. Among the current drinkers, 90 (83.3%) reported first abstaining from alcohol for at least 90 days during follow-up. As illustrated in Fig. 2, the majority ($n = 50$) of those who abstained reported doing so during the first 90 days after ART initiation—that is by their 3-month visit. Becoming abstinent was less common later during follow-up; 14 participants