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AIDS Care: Psychological and Socio-medical Aspects of AIDS/HIV

Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/caic20

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Published online: 21 Jul 2014.

To cite this article: William Zule, Bronwyn Myers, Tara Carney, Scott P. Novak, Kaitlin McCormick & Wendee M. Wechsberg (2014): Alcohol and drug use outcomes among vulnerable women living with HIV: results from the Western Cape Women's Health CoOp, AIDS Care: Psychological and Socio-medical Aspects of AIDS/HIV, DOI: 10.1080/09540121.2014.933769

To link to this article: http://dx.doi.org/10.1080/09540121.2014.933769

AIDS Care, 2014
http://dx.doi.org/10.1080/09540121.2014.933769

Routledge
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Alcohol and drug use outcomes among vulnerable women living with HIV: results from the Western Cape Women's Health CoOp

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(*Received 5 November 2013; accepted 9 June 2014*)

Alcohol and other drug use can negatively affect adherence to and retention in antiretroviral therapy (ART) among people living with HIV/AIDS. Yet, there are few brief interventions that reduce these behaviors among this population. This article presents the findings from a randomized field experiment that assessed the effects of a woman-focused intervention (the Women's Health CoOp [WHC]) on reducing alcohol and other drug use among vulnerable women in Cape Town, South Africa. The analyses were limited to 84 women living with HIV who reported drinking alcohol at baseline. Because of the small sample size, analyses were performed using an exact logistic regression procedure. At 12-month follow-up, women in the WHC arm were more likely to be abstinent from alcohol (odds ratio [OR] = 3.61; 95% confidence intervals [CI] = 1.23, 11.70; $p = 0.016$) and somewhat more likely to test negative for other drugs (OR = 3.07; 95% CI = 0.83, 12.31; $p = 0.105$), compared with women in the comparison arms. This study provides preliminary evidence of the efficacy of a brief, woman-focused intervention in reducing alcohol and other drug use among vulnerable women living with HIV and it has implications for HIV treatment.

Keywords: alcohol and other drug use; HIV/AIDS; Women's Health CoOp; intervention; South Africa

Introduction

Alcohol and other drug use have been linked to poor adherence to antiretroviral therapy (ART; Azar, Springer, Meyer, & Altice, 2010; Grodensky, Golin, Ochtera, & Turner, 2012; Jaquet et al., 2010; Van geertruyden, Woelk, Mukumbi, Ryder, & Colebunders, 2010), more rapid HIV disease progression (Baum et al., 2010; Samet et al., 2007), and poorer HIV treatment outcomes among people living with HIV/AIDS (PLWHA; Azar et al., 2010). The success of ART in reducing HIV incidence in serodiscordant couples (Cohen et al., 2011) generated hope that HIV epidemics could be controlled and reversed through the use of HIV treatment as prevention (Branson, Viall, & Marum, 2013; Granich, Williams, & Montaner, 2013). This approach involves aggressive campaigns to test more people for HIV (particularly those at highest risk), link people who are HIV positive to treatment, and retain them in treatment (Check Hayden, 2010; Hull, Wu, & Montaner, 2012). High levels of ART adherence are required to achieve undetectable HIV viral loads (Kilmarx & Mutasa-Apollo, 2013) in people who are being treated. Seek, test, and treat strategies focus on key affected populations such as people who use alcohol and other drugs, sex workers, and men who have sex with men. Consequently, they increase the percentages and absolute numbers of people with alcohol and other drug use problems who are enrolled in ART. Accordingly, there is a tremendous need for efficacious brief interventions that can reduce alcohol use among PLWHA in order to realize the full benefit of these lifesaving medicines.

Numerous brief interventions have demonstrated efficacy in reducing alcohol use in a variety of populations (Ballesteros, González-Pinto, Querejeta, & Ariño, 2004; Moyer, Finney, Swearingen, & Vergun, 2002; Nilsen, 2010). However, relatively few have been tested and demonstrated efficacy in reducing alcohol use in South African populations (Myers, Stein, Mtukushe, & Sorsdahl, 2012; Pengpid, Peltzer, Skaal, & Van der Heever, 2013). Even fewer have demonstrated efficacy in reducing alcohol use among South African women living with HIV (Wechsberg et al., 2013).

This report describes the effects of a brief intervention to reduce alcohol and other drug use among Black and Coloured South African women living with HIV. (The term "Coloured" refers to people of mixed race ancestry who form a particular ethnic and cultural grouping in South Africa.) The effects of the intervention on drug use, sex risk, and violent victimization among women living with HIV and those who are HIV negative have been reported previously (Wechsberg et al., 2013).

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Methods

Study design, eligibility, and recruitment

The data analyzed in this study were collected as part of a randomized community field experiment conducted within disadvantaged communities in Cape Town, South Africa. Inasmuch as the methods and main intervention outcomes have been described in detail elsewhere (Wechsberg et al., 2013), they will only be described briefly here. Overall, 720 drug-using women were recruited between September 2008 and January 2011 using street outreach techniques whereby outreach workers approached adult women within target communities and screened them for potential study eligibility. To be eligible for the study, participants had to be female, between 18 and 33 years of age, sexually active within the past 3 months, reside in a low-income disadvantaged community close to Cape Town's International airport, report using at least two drugs (one of which could be alcohol) at least once a week for the past 3 months, and provide informed consent and verifiable locator information. Women who met the eligibility criteria during screening were invited to participate in the study and an appointment was made for their enrollment and baseline assessment.

Women were screened again for eligibility at the initial appointment, and after providing informed consent they were enrolled into the study. After enrollment, an interviewer-administered questionnaire was completed and biological testing was conducted for HIV, recent alcohol and other drug use, and pregnancy. This report analyzes data for the subset of 84 women who tested positive for HIV and at their baseline interview reported drinking alcohol.

Randomization, interventions, and follow-up assessments

After the baseline assessment, participants were randomized by computer to one of three intervention conditions: 50% of participants were randomized to the Women's Health CoOp (WHC), a woman-focused HIV prevention intervention that includes HIV counseling and testing (HCT); 25% to an equal-attention comparison group that consisted of a nutrition intervention and HCT (nutrition); and 25% to an HCT-only control group.

The WHC comprises four 1-hour intervention modules that are delivered over two contact sessions and together examine alcohol and other drug use, sex risk behaviors, violence, and gender inequality. In the first contact session, information is provided about alcohol- and drug-related sex risk for HIV (Module 1), and sexual negotiation skills and condom mastery skills are taught (Module 2). In the second contact session, participants explore relationship power and are taught communication and negotiation skills within relationships (Module 3), as well as tactics for dealing with potentially violent situations (Module 4). The process of developing and adapting the WHC intervention has been described in detail elsewhere (Wechsberg, Browne, Ellerson, & Zule, 2010). The nutrition intervention also consists of four 1-hour intervention sessions distributed across two contact sessions. Participants in this intervention arm received information about the basic food groups, principles of healthy eating, and food preparation, and healthy food that can be prepared with a limited budget. Both of these interventions are delivered in a group format and facilitated by a peer educator.

After completing the interventions, participants completed 3-, 6-, 9-, and 12-month follow-up assessments, where the baseline interview was readministered. Biological testing for HIV, pregnancy, and alcohol and other drug use was conducted at the 6- and 12-month follow-up assessments only.

Measures

The baseline interview collected data on participant demographics, including ethnicity (Black African or Coloured), age, marital status, highest grade of education, employment status, and self-reported frequency and quantity of alcohol use, which were measured as ordinal categories. Based on the self-reported frequency of alcohol use, we constructed a dichotomous variable for abstinence from alcohol where any drinking was coded 0 and no drinking (abstinence) was coded as 1. In addition, we constructed a variable based on the results of urine drug screen results for recent opiate, cocaine methamphetamine, and methaqualone (i.e., Mandrax) use. Participants who tested negative for all four of these drugs were coded as 1 (abstinent) and participants who tested positive for one or more of these drugs were coded as not abstinent 0 (positive).

Analysis

To assess randomization bias, we examined whether alcohol-using women living with HIV assigned to the WHC intervention differed from women assigned to the comparison arms (nutrition + HCT) on sociodemographic characteristics and alcohol and other drug use at baseline. Pearson's chi-square test was used to compare categorically distributed variables and *t*-tests were used to compare continuously distributed variables, allowing for a Bonferroni correction for multiple comparisons. We also assessed the dropout rates by condition to identify attrition biases. To understand the effect of the intervention on study outcomes, we examined differences in the intervention at 12-month follow-up using exact binary logistic regression using SAS version 9.3. We also conducted sensitivity analyses to determine

whether the main effect of the intervention was robust after controlling for baseline levels of alcohol and other drug use (Moss, Chen, & Yi, 2012).

Results

Baseline characteristics

No significant sociodemographic differences or differences in alcohol or other drug use were found among women randomized to the WHC intervention and those in the combined comparison group (see Table 1).

Alcohol use at follow-up

In the unadjusted logistic regression model, women in the WHC intervention condition were more likely to report that they were abstinent from alcohol compared with women assigned to the comparison conditions (45.5% vs. 17.5%; odds ratio [OR] = 3.86; 95% confidence interval [CI] = 1.31, 12.65; p = 0.011). In sensitivity analyses that adjusted for the frequency and quantity of alcohol consumed at baseline, women in the WHC intervention condition were more likely to report that they were abstinent from alcohol than women assigned to the comparison conditions (OR = 3.61; 95% CI = 1.23, 11.70; p = 0.016; see Table 2).

Urine drug screen results at follow-up

In an unadjusted logistic regression model, women in the WHC intervention condition were no more likely than women in the combined comparison group to test negative for opiates, cocaine, methamphetamine, and methaqualone (65.9% vs. 52.5; OR = 1.74; 95% CI = 0.66, 4.63; see Table 2). In sensitivity analyses that adjusted for the number of drugs with positive urine drug screen results at baseline, women assigned to the WHC intervention condition were somewhat more likely to provide a urine sample that tested negative for all four drugs (OR = 3.07; 95% CI = 0.83, 12.31; p = 0.105) than women in the combined comparison group.

Discussion

Alcohol and other drug use are a major problem among PLWHA (Bhat et al., 2010; Bryant, 2006; Kalichman et al., 2013; Rosen et al., 2013) because of its impact on HIV treatment adherence (Azar et al., 2010; Jaquet et al., 2010; Van geertruyden et al., 2010), disease progression, and treatment outcomes (Baum et al., 2010; Samet et al., 2007). Reducing alcohol and other drug use among PLWHA may hold many personal and public health benefits. Moreover, improving adherence to ART has the added benefit of reducing HIV viral load, thereby lowering the risk of secondary transmission. Although longer (i.e., ≥8 sessions) interventions have shown promise in reducing alcohol use among men and women living with HIV (Meade et al., 2010; Parsons, Golub, Rosof, & Holder, 2007), few studies have tested brief (i.e., ≤2 sessions) interventions for reducing alcohol and other drug use among women who are living with HIV. This study is among the first to test the efficacy of a brief woman-focused intervention for reducing alcohol and other drug use among vulnerable South African women living with HIV.

Table 1. Baseline characteristics of women assigned to the WHC intervention and to the comparison conditions.

	WHC intervention	Comparison conditions	p value
Mean age (SD)	23.9 (4.2)	22.8 (3.7)	0.219
Race/ethnicity			0.845
% Black African	84.1	82.5	
% Coloured[a]	15.9	17.5	
% Married or living as married	4.5	17.5	0.079[b]
Mean highest grade completed (SD)	9.6 (2.3)	9.7 (2.2)	0.824
% Unemployed	90.0	90.9	1.000[b]
Self-reported alcohol use in past year			
% Drinking > weekly	52.3	62.5	0.344
% >4 drinks per occasion	72.7	77.5	0.614
Biological testing for recent hard drug use			
% Positive for opiates	6.8	7.5	0.904
% Positive for cocaine	2.3	7.5	0.261
% Positive for methamphetamine	36.4	37.5	0.914
% Positive for methaqualone	29.5	17.5	0.195
% Positive for any of the 4 drugs	47.7	47.5	0.983

[a]The term "Coloured" refers to people of mixed race ancestry who form a particular ethnic and cultural grouping in South Africa.
[b]Fisher's exact test.

Table 2. Intervention effects on alcohol use and other drug use at 12-month follow-up interview.

	Coefficient	Score test	df	Odds ratio (95% CI)	*p* value
Logistic regression of abstinence from alcohol					
Unadjusted model	1.35	7.42	1	3.86 (1.31–12.65)	0.011
Adjusted for frequency and quantity of alcohol use at baseline	1.28	6.78	1	3.61 (1.23–11.70)	0.016
Logistic regression of negative urine drug screen results for use of opiates, cocaine, methamphetamine, and methaqualone					
Unadjusted model	0.55	1.55	1	1.74 (0.66–4.63)	0.304
Adjusted for number of drugs positive for at baseline	1.12	3.54	1	3.07 (0.83–12.31)	0.105

The findings indicate that the WHC intervention was efficacious in helping vulnerable women living with HIV stop using alcohol, and to a lesser extent other drugs, at 12-month follow-up. Women allocated to the WHC intervention were significantly more likely to report abstinence from alcohol use than women in the comparison conditions, and the effect was robust in sensitivity analyses that adjusted for quantity and frequency of alcohol use at baseline. Similarly, although not statistically significant at $p < 0.05$, women assigned to the WHC intervention were three times more likely to test negative for opiates, cocaine, methamphetamine, and methaqualone than women in the comparison conditions.

These findings have important implications for HIV treatment as prevention within the South African context. For treatment as prevention to be successful, aggressive case finding is needed so that the proportion of PLWHA on ART is increased (Hull et al., 2012; Smith, Powers, Kashuba, & Cohen, 2011). However, this group is more likely to have higher levels of alcohol and other drug use than people who are already engaged in HIV care. Consequently, as treatment as prevention is scaled up, the percentage of people with alcohol and other drug problems receiving ART and other HIV treatment services is likely to increase. Under these circumstances, the WHC intervention could be a particularly important tool for helping HIV treatment providers to address alcohol and other drug use and associated risks among vulnerable women and to help them maximize the benefits of ART.

These promising findings, however, should be considered in light of several limitations. First, abstinence from alcohol at 12-month follow-up is based on self-report, which is subject to errors in recall as well as socially desirable responses. Although we used breathalyzers to detect recent alcohol use, this type of test does not reliably detect alcohol use that occurred greater than 24 hours or more in the past (Carroll & Durrant, 2000). Future studies should consider confirming self-reported substance use with more state-of-the-art biological markers, such as those that test hair samples to detect alcohol use over much longer periods (Albermann, Musshoff, & Madea, 2010). Second, we did not directly examine the effect of women's reduced drinking and other drug use on ART adherence and HIV treatment outcomes. Third, the study was not designed or powered to answer questions regarding alcohol and drug use in this small (n = 84) subsample of HIV-positive women who were drinking alcohol at baseline. In post-hoc power analyses computed using G*Power 3.1.9.2 (Faul, Erdfelder, Buchner, & Lang, 2009), in the adjusted logistic regression models we had 75% power to detect the observed between group differences in abstinence from alcohol, and 62% power to detect between group differences in drug use at 12-month follow-up. Future studies are needed that are fully powered to examine the impact of the WHC intervention for reducing alcohol and other drug use and improving ART adherence and HIV treatment outcomes before definitive conclusions about the benefits of this intervention for HIV treatment and care can be drawn.

In conclusion, the WHC intervention was efficacious in reducing alcohol and other drug use among vulnerable women in this study who are living with HIV, suggesting that settings where vulnerable women seek HCT and HIV treatment may be a useful starting point for implementing this intervention. Additional research is needed to determine how best to integrate the WHC intervention into settings where HIV testing and treatment services are offered, how to address possible organizational and provider barriers to implementing the intervention in these settings, and whether the intervention helps to improve ART adherence and HIV treatment outcomes.

Acknowledgments

The findings and conclusions presented are solely the responsibility of the authors and do not necessarily represent the official views of the NICHD or the National Institutes of Health (NIH). The NIH had no role in the study design; in the collection, analysis, and interpretation of data; in the writing of this article; or in the decision to submit the article for publication.

Funding

This study was funded by the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) [grant number R01 HD058320] (Wechsberg).

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