



Short communication

Non-medical use of non-opioid psychotherapeutic medications in a community-based cohort of HIV-infected indigent adults



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ABSTRACT

Background: Non-opioid psychotherapeutic medications significantly increase the risk of opioid overdose-related deaths. We prospectively followed HIV-infected indigent adults sampled from the community to examine rates of and factors associated with non-medical use of benzodiazepines, muscle relaxants, and prescription stimulants.

Methods: We interviewed participants quarterly for 2 years about alcohol and illicit substance use; depression; use of prescribed opioid analgesics, benzodiazepines and muscle relaxants; opioid analgesic misuse; and non-medical use (i.e., use without a prescription) of benzodiazepines, muscle relaxants, and prescription stimulants. Using mixed-effects multivariate logistic regression, we determined factors associated with non-medical use of benzodiazepines, muscle relaxants, and prescription stimulants.

Results: Among the 296 participants at enrollment, 52.0% reported taking opioid analgesics that had been prescribed, 17.9% took benzodiazepines that had been prescribed, and 8.1% took muscle relaxants that had been prescribed. Over the 2-year study interval, 53.4% reported prescription opioid misuse, 25.3% reported non-medical use of benzodiazepines, 11.5% reported non-medical use of muscle relaxants, and 6.1% reported non-medical use of prescription stimulants. In multivariable analysis, opioid analgesic misuse in the past 90 days was associated with non-medical use of benzodiazepines, muscle relaxants, and prescription stimulants during the same time interval. Illicit substance use and depression were not associated with non-medical use of these medications.

Conclusions: Prescription opioid analgesic misuse is associated with non-medical use of other psychotherapeutic medications. Health care providers should monitor for non-medical use of a broad array of psychoactive medications among high-risk populations to minimize harm.

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1. Introduction

Prescription drug abuse is the fastest growing drug problem in the United States, with more unintentional overdose deaths attributable to prescription drugs than to heroin and cocaine combined (Centers for Disease Control and Prevention (CDC),

2012). Until recently, prescription drug abuse was more common in rural regions, where inadequate access to health care and pain specialists led to the marked increase in the use of opioid and non-opioid psychotherapeutic medications for the treatment of chronic non-cancer pain (Cole and Logan, 2010; Keyes et al., 2014). However, recent data show that rates for prescription drug abuse or dependence are higher in both large and small metropolitan counties than in non-metropolitan counties (including less-urbanized and rural counties), suggesting that the prevalence of prescription drug abuse is increasing in urban locales (SAMHSA, 2013).

While research has focused on the misuse of prescription opioid analgesics, few studies have focused on the misuse of

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non-opioid psychotherapeutic medications, which are present in a significant proportion of prescription opioid overdose deaths (Hall et al., 2008; Jones et al., 2012). Benzodiazepines are the most common non-opioid psychotherapeutic medication involved in opioid overdose deaths (Dunn et al., 2010; Gomes et al., 2011; Jann et al., 2014). The concurrent use of opioid analgesics with benzodiazepines, with or without a prescription, has increased significantly in recent years (Jones et al., 2012), and are responsible for the majority of emergency department visits related to abuse and overdose of psychotherapeutic medications (CDC, 2010). Although muscle relaxants and prescription stimulants are implicated less often in prescription opioid overdose deaths (Hall et al., 2008), they are co-prescribed often with opioids (Jones et al., 2012).

Persons living with HIV/AIDS (PLWHA) are prescribed opioid analgesics at high rates and have co-existing mental health disorders and substance use disorders, which are known risk factors for misuse (Vijayaraghavan et al., 2013). Few studies have examined the prevalence and correlates of non-medical use of non-opioid psychotherapeutic medications among PLWHA. We examined these factors in order to provide insights into developing effective prevention and intervention strategies to prevent misuse and overdose.

In this longitudinal study of a community-sampled cohort of HIV-infected indigent adults, we examined rates of and factors associated with non-medical use of benzodiazepines, muscle relaxants, and prescription stimulants. We hypothesized that the misuse of prescription opioids would be associated with non-medical use of these medications.

2. Methods

2.1. Study participants and sampling

We recruited participants from the Research on Access to Care in the Homeless (REACH) study, a longitudinal cohort of homeless and marginally housed HIV-infected adults in San Francisco who were recruited in three waves (1996–1997, 1999–2000, 2003–2004) using population-based sampling from homeless shelters, free-meal programs, and single-room occupancy hotels (SRO; Robertson et al., 2004). Eligible participants needed to be either homeless or marginally housed (living in an SRO that charged less than \$600 per month). Each participant was HIV tested at enrollment; those who tested positive for HIV infection were invited to enroll. Approximately 88% of eligible participants enrolled in the REACH study, and enrollees were followed prospectively every 3 months. For the current study (Pain Study), we recruited all REACH participants who completed a quarterly REACH interview during the study enrollment period between September 2007 and June 2008 ($n = 337$) (Miaskowski et al., 2011). The majority ($n = 306$) of the REACH cohort members provided written informed consent to participate in the Pain Study. The final Pain Study sample included 87.8% ($n = 296$) of active REACH participants. The University of California, San Francisco (UCSF) Institutional Review Board reviewed and approved all study protocols. We obtained a Certificate of Confidentiality from the National Institute on Drug Abuse.

2.2. Study procedures

We met with participants at the UCSF Clinical and Translational Research Institute's Tenderloin Clinical Research Center (TCRC), a community-based university research site. The study included an enrollment interview and seven follow-up interviews over a two-year interval. Trained research assistants administered structured questionnaires. We reimbursed participants \$20 for the enrollment and \$5 for each quarterly interview, and \$20 for each REACH study quarterly interview.

2.3. Non-medical use of benzodiazepines, muscle relaxants, and prescription stimulants

We defined non-medical use of benzodiazepines (e.g., lorazepam, alprazolam, or diazepam), muscle relaxants (e.g., cyclobenzaprine, carisoprodol, baclofen), and prescription stimulants (e.g., dextroamphetamine, methylphenidate) as use without a prescription from a health care provider. Using Audio Computer Assisted Self-Interview (ACASI) technology, participants self-reported lifetime and past 90-day occurrences of non-medical use of benzodiazepines, muscle relaxants, and prescription stimulants. To assess lifetime non-medical use of benzodiazepines, we asked participants, "Have you ever in your lifetime used sedating or anti-anxiety

Table 1

Lifetime and past 90-day rates at enrollment, and cumulative rates over the study interval of non-medical use of benzodiazepines, muscle relaxants, and prescription stimulants, and opioid analgesic misuse ($N = 296$).

	Lifetime rate N (%)	Past 90-day rate N (%)	Cumulative rate ^d N (%)
Non-medical use of benzodiazepines ^a	85 (28.7)	26 (8.8)	75 (25.3)
Non-medical use of muscle relaxants ^b	44 (14.9)	10 (3.4)	34 (11.5)
Non-medical use of prescription stimulants ^c	28 (9.5)	5 (1.7)	18 (6.1)
Opioid analgesic misuse ^e	160 (54.4)	72 (24.3)	158 (53.4)

^a Non-medical use of benzodiazepines including lorazepam, alprazolam, or diazepam.

^b Non-medical use of muscle relaxants including cyclobenzaprine, carisoprodol, or baclofen.

^c Non-medical use of prescription stimulants including dextroamphetamine or methylphenidate.

^d Cumulative rate over 2 year study interval.

^e Defined as any behavior that increases risk for overdose or legal consequences or behaviors for which more than 50% of the participants reported that the motivation for opioid analgesic misuse was to get high.

medications that you got without a prescription from a health care provider?" We asked a similar question to assess non-medical use during the past 90 days at enrollment and at each quarterly visit. We used similar questions to assess non-medical use of muscle relaxants and prescription stimulants, providing examples of drug names for each medication class.

2.4. Opioid analgesic misuse

Participants self-reported opioid analgesic misuse behaviors using ACASI technology at each interview. For each type of opioid analgesic misuse behavior, participants were asked whether they had ever used an opioid medication to engage in that activity (e.g., "to get high."). We asked a similar question to assess misuse during the past 90 days at enrollment and at each quarterly visit. We defined opioid analgesic misuse as behaviors that posed imminent risk for overdose or legal peril, or aberrant behaviors for which more than 50% of the participants reported that their motivation for the behavior was to get high (Vijayaraghavan et al., 2013).

2.5. Covariates

At the enrollment interview, we assessed lifetime alcohol abuse or dependence using the Diagnostic Interview Schedule-IV (DIS-IV) instrument for alcohol use disorders (Robins et al., 1981). At each quarterly visit, participants self-reported the number of days they drank in the past 30 days and the average number of drinks consumed on days that they drank. We defined problem drinking as >7 drinks per week for women and >14 drinks per week for men (National Institute on Alcohol Abuse and Alcoholism, 2005). Using the DIS-IV instrument (Robins et al., 1981), we assessed lifetime substance abuse or dependence for illicit substances (e.g., cocaine, methamphetamine, heroin/opiates). At each quarterly visit, participants self-reported whether they had used any illicit substances in the past 90 days. We identified those who did as current users of illicit drugs.

We defined medical use of a psychotherapeutic medication as use with a prescription from a health care provider. At each quarterly visit, we assessed medical use of a non-opioid psychotherapeutic medication (e.g., benzodiazepines and muscle relaxants) by asking participants, "During the past 90 days have you used any of these medicines that were prescribed to you by a healthcare provider, for pain or any other medical reason?" For medical use of prescription opioids, we asked participants, "During the past 90 days, have you taken any of these medicines prescribed to you to treat pain?" We did not examine medical use of prescription stimulants.

Participants self-reported information on demographics (age and sex), and race/ethnicity (white, African American, Hispanic or mixed/other). We reported lifetime history of chronic homelessness (homeless for at least one year since the age of 18) at enrollment. We assessed depression at each quarterly visit using the Beck Depression Inventory II (BDI-II), and categorized participants as having no (BDI-II score ≤ 13), mild (BDI-II score 14–18), or moderate to severe (BDI-II score ≥ 19) depression (Beck et al., 1996).

2.6. Statistical analysis

We described sample characteristics at the enrollment visit for categorical and continuous variables. We reported lifetime and past 90-day rates of non-medical use of non-opioid psychotherapeutic medications and opioid analgesic

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