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Prescription opiate misuse among rural stimulant users in a multi-state community-based study

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Abstract

Objectives—The purpose of the current analysis was to examine the factors associated with prescription opiate misuse among stimulant users from rural counties in Arkansas, Kentucky, and Ohio (N=714).

Methods—Multiple logistic regression was utilized to determine the independent correlates of recent (prior 6 months) prescription opiate misuse.

Results—More than half of participants (53.2%) reported prescription opiate misuse in the previous 6 months. Other drug use (heroin, cocaine, methamphetamine and marijuana) and anxiety (Adjusted Odds Ratio: 2.04, 95% Confidence Interval: 1.60, 2.59) were independently associated with prescription opiate misuse. Chronic pain and other health indicators were not associated with prescription opiate misuse after adjustment for covariates.

Conclusions—Results indicate that illicit drug involvement and psychiatric symptoms may be driving the high rates of prescription opiate misuse among rural stimulant users. These findings have implications for the provision of treatment in resource-deprived rural areas.

Keywords

prescription opiates; methamphetamine; cocaine; stimulants; rural

1. Introduction

Recently, there has been a marked increase in the number of nonmedical prescription opiate users (i.e., those who use prescription opiates for the euphoric effects or that are not prescribed for them). Data from the National Survey on Drug Use and Health indicate a triple digit increase in the number of new nonmedical users between 2002 and 2004 ¹, and treatment data suggest that nonmedical prescription opiate use may be more prevalent in

rural areas. From 1997 to 2002, treatment admissions for prescription opiate misuse climbed 269% in rural areas, compared with only 58% in urban areas ².

While the number of new methamphetamine users has remained relatively stable since 2002, between 2002 and 2004 there was a 110% increase in those who met the DSM-IV criteria for methamphetamine abuse or dependence ³. Similar to early research on prescription opiate misuse ⁴, methamphetamine use is more prevalent in rural areas ⁵. Use of other stimulants, namely cocaine and crack cocaine, are also prevalent in the United States. In 2002 and 2003, almost 6 million Americans reported using cocaine in the previous year, and 1.5 million used crack cocaine ⁶.

While there has been significant focus on use of both cocaine and heroin, especially in methadone maintained populations ⁷, few studies have examined prescription opiate use in a stimulant-using (methamphetamine and/or cocaine) population. This line of study may be particularly important in rural areas where prescription opiates, and not heroin, are the primary opiates of choice ⁸. Therefore, the purpose of the current analysis was to examine the correlates of prescription opiate misuse among stimulant users from rural Arkansas, Kentucky, and Ohio.

2. Methods

2.1 Sample

The sample population consists of 714 stimulant users from nine rural counties in Arkansas, Kentucky and Ohio. Rural, for the purposes of the current study, was defined as a county having a population of less than 50,000, according to the 2000 U.S. Census ⁹. Eligibility criteria included the following: 1) self-reported use of cocaine, crack and/or methamphetamine in the prior 30 days; 2) age 18 or greater; 3) not in substance abuse treatment in the prior 30 days; 4) be a resident of one of the nine target counties; and 5) consent to participate in the study.

Respondent driven sampling (RDS) was used to recruit participants ^{10, 11}. RDS has been shown to be particularly effective in recruiting hidden populations, such as illicit drug users, and is preferable to other sampling techniques since the data gathered are more likely to be attributable to the general population ^{10, 11}. The study was approved by the Institutional Review Boards at Wright State University, the University of Arkansas, and the University of Kentucky.

Baseline data were collected between 2002 and 2004 and an interviewer-administered questionnaire was given to consenting participants who were compensated \$50 for interviews lasting 2- 2.5 hours. See Booth and colleagues ¹² for a thorough explanation of the study methodology.

2.2 Measures

The dependent variable of interest was recent prescription opiate misuse, which was ascertained via self-report. Participants were asked whether they had ever used OxyContin or other painkillers that were not prescribed for them. If they answered yes, they were specifically asked "During the past six months, how often did you use OxyContin?" The same question was asked of other prescription painkillers. If they responded that they had used either OxyContin or other prescription painkillers in the prior six months, the response was coded as 1. Otherwise, it was coded as 0. Other drug use was also measured in this way. Injection drug use (IDU) was defined as use of cocaine, methamphetamine, prescription opiates or heroin via injection in the prior 6 months. Independent variables selected *a priori* to test their association with prescription opiate misuse included: other illicit drug use/non-

use in the previous 6 months, sociodemographics, perceived health status, and psychiatric indicators.

The Brief Symptom Inventory (BSI) ¹³ was utilized to measure symptoms of psychopathology, and more specifically past week anxiety and depression. The reliability and validity of the instrument have been shown to be good ¹³, and the internal consistency for the overall scale, depressive, and anxiety subscales for the current study was excellent ($\alpha=0.967$, $\alpha=0.861$ and $\alpha=0.857$, respectively).

2.2.1. Chronic Pain and Health—Participants were asked in an open-ended question if they had experienced a physical health problem in the prior 6 months, and if so, to identify what the problem(s) were, the severity of the problem, and if the problem lasted longer than three months. The lead author coded each health problem as chronic pain if it was a condition that is known to cause pain (such as fibromyalgia, arthritis, or migraine headaches), was identified by the participant as at least mildly serious, and lasted three months or longer. Participants were also asked to rate their health for the prior six month period. Possible responses included excellent, very good, good, fair and poor. For the purposes of the current study, responses were collapsed from five categories to two: excellent/very good/good, and fair/poor.

2.3 Statistical Analysis

To examine the bivariate associations between prescription opiate misuse and the independent variables of interest, chi-square analyses and the Wilcoxon rank-sum test were utilized for categorical and continuous variables, respectively. Multiple logistic regression was used to examine the independent correlates of prescription opiate misuse. Variables that were statistically significant ($p < 0.05$) in bivariate analyses were offered into the model one at a time until the most parsimonious model was achieved. The adjusted odds ratios and corresponding 95% confidence intervals are presented. Confidence intervals that do not include 1 are considered statistically significant at the $p < 0.05$ level. STATA, version 8.0 (College Station, TX) was used for all analyses.

3. Results

As seen in Table 1, the majority of the 714 participants were male (61.5%), white (68.1%), and the median age was 31 (interquartile range [IQR]: 23 - 41). Most of the rural stimulant users had at least a high school education, were single (48.6%) and unemployed (49.7%). The overall prevalence of prescription opiate misuse in the previous 6 months was 53%. Those who were misusing prescription opiates were significantly more likely than those not misusing prescription opiates to be white, younger, have fewer years of education and be from the rural Ohio sites.

Those misusing prescription opiates were also more likely to have higher depression and anxiety scores on the Brief Symptom Inventory (BSI), indicating greater psychiatric morbidity (Table 2). Prescription opiate misusers were also twice as likely to report conditions associated with chronic pain in the six months prior to the baseline interview. Use of alcohol and crack were similar among prescription opiate users and non-users; however, those misusing prescription opiates were significantly more likely to have also used heroin, cocaine, methamphetamine, and marijuana in the prior 6 months than those who did not report prescription opiate misuse. Finally, injection drug use (IDU) was also significantly more prevalent among those misusing prescription opiates.

As seen in Table 3, symptoms of anxiety were independently associated with recent prescription opiate misuse (Adjusted Odds Ratio [AOR]: 2.04, 95% Confidence Interval

[CI: 1.60, 2.59), after adjustment for other covariates, including other drug use, site, race, and age. Other recent drug use, including heroin, cocaine, methamphetamine, and marijuana use was also positively correlated with prescription opiate misuse. Those injecting drugs were also twice as likely to be prescription opiate misusers (AOR: 2.02, 95% CI: 1.09, 3.74). Finally, participants from the Arkansas sites, African-Americans, and older participants were significantly less likely to have misused prescription opiates, even after adjustment for the other psychiatric and drug use indicators in the model.

4. Discussion

In this study of rural, community-based stimulant users, we found a high prevalence of comorbid prescription opiate misuse. In fact, in the six months prior to the baseline interview, more than half of all rural stimulant users surveyed misused prescription opiates at least once. Further, the data supported our hypothesis that prescription drugs are far more prevalent in rural areas than is heroin. However, amongst the heroin users, all but 6 (8.5%) were also misusing prescription opiates. This is in accord with previous reports from this same cohort that polydrug use is highly prevalent among rural stimulant users ¹².

The data only partially supported our other hypothesis; namely that health and psychiatric problems would be independently associated with prescription opiate misuse. While symptoms of anxiety were associated with prescription opiate misuse after adjustment for other drug use and sociodemographics, depressive symptoms and chronic pain were not.

Given the known association between pain, drug use and psychiatric distress ^{14, 15}, the authors hypothesized that greater levels of psychiatric symptoms would be associated with prescription opiate misuse in this cohort of rural stimulant users. And, for the most part, the data supported this hypothesis. Those misusing prescription opiates were two times more likely than those not using prescription opiates to have a greater score on the anxiety subscale of the BSI, indicating higher levels of anxiety in the past week. However, depressive symptoms were not associated with a greater likelihood of having misused prescription opiates after adjustment for sociodemographics, other drug use and anxiety. Other studies indicate that anxiety disorders are highly prevalent among treated opiate users ^{16, 17}, suggesting that opiate users may be self-medicating. As described by Khantzian ¹⁸, substance use may be one way in which those with psychiatric symptoms regulate their affect.

Another interesting result of the current study was that injection drug use was far more prevalent among those who reported recent prescription opiate misuse. While this finding is supported by two recent studies of rural Appalachian drug users ^{8, 19}, it was unknown whether this would carry over to rural areas where prescription opiate misuse was not as highly publicized in the media (i.e., areas outside of Appalachia). Injection drug use is of particular concern given its association with the transmission of blood borne infections such as HIV and hepatitis C ^{20, 21}. Further, rural areas may be ill equipped to treat these infections given the noted lack of resources in many rural health care systems ²².

In this study we found that African Americans and older participants were significantly less likely than white and younger participants to be misusing prescription opiates. This is not surprising, especially given that prescription opiate misuse has been found to be prevalent in rural areas where the population is primarily white ⁸. And even among treated populations of prescription drug users, minority populations are significantly less likely to have used prescription drugs ¹⁵. Similarly, other studies have found that older individuals are significantly less likely to be misusing prescription opiates than those who are younger ¹⁵.

4.1 Limitations

First, it should be noted that the sample consisted entirely of illicit stimulant users, therefore, the results are likely not generalizable to other populations. Since the questionnaire did not distinguish between prescription opiates and heroin to ascertain DSM-IV abuse and/or dependence, the authors used prescription opiate misuse as the dependent variable, which is a less precise measure of use. Also, the measure of chronic pain for the current study may not have adequately captured the presence or absence of pain for this population. While there were measures of pain in the questionnaire that may have further distinguished the prescription opiate misusers and non-users, the data were not systematically collected for all of the sites. We also utilized a chain-referral technique (RDS) to sample the population, which may in fact limit the generalizability of the findings. However, analysis specific to this population was conducted and findings indicated that use of RDS was successful in recruiting a sample that was representative of the areas under study²³. Data were also cross-sectional and therefore temporality of the dependent and independent variables could not be firmly established and causal inferences could not be made. Another potential limitation was that our dependent variable, prescription opiate misuse, was also based on self-reported information. However, in the absence of a more valid measure such as urinalysis, self-reported drug use has been shown to be a valid measure of actual drug use²⁴. Finally, the data did not allow for examination of concomitant use of prescription opiates and stimulants, so it is unknown whether use of these drugs in rural areas mirrors urban use. It would be of use to know, however, whether speedball use (or use of similar combinations of prescription opiates and cocaine) is prevalent in rural areas given previous findings about the severity of drug use and increased HIV risk behaviors among urban speedball users²⁵⁻²⁷. Despite these limitations, the data are novel in that they provide further evidence of high rates of prescription opiate misuse in rural areas among a large cohort of rural stimulant users. Longitudinal study of this problem is warranted.

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Table 1

Sociodemographic characteristics of 714 rural stimulant users

	Rx Opiate Misuse (n=380)		No Rx Opiate Misuse (n=334)		p-value
	N	%	n	%	
Gender					
Male	233	61.3	147	61.7	0.939
Race					
African American	45	11.8	163	48.8	<0.001
Caucasian	325	85.5	161	48.2	
Other	10	2.6	10	3.0	
Age, median years (IQR)	27 (21.25 – 38)		36.5 (26 – 43)		<0.001
Education, median years (IQR)	12 (10 – 12)		12 (11 – 12)		0.006
Marital Status					
Married	57	15.0	55	16.5	0.630
Widowed/Separate/Divorced	132	34.7	123	36.8	
Single, never married	191	50.3	156	46.7	
Employment					
Unemployed	184	48.4	171	51.2	0.289
Employed	136	35.8	103	43.1	
Other	51	13.4	54	51.4	
Site					
Arkansas	74	19.5	163	48.8	<0.001
Kentucky	121	31.8	104	31.1	
Ohio	185	48.7	67	20.0	

Table 2

Psychological, health and drug use characteristics of rural stimulant users

	Rx Opiate Misuse (n=380)		No Rx Opiate Misuse (n=334)		
	N	%	n	%	p-value
BSI – Depress, median (IQR)	0.83 (0.33 – 1.66)		0.33 (0 – 1.0)		<0.001
BSI – Anxiety, median (IQR)	1.0 (0.33 – 1.66)		0.33 (0 – 0.7)		<0.001
Chronic pain prior 6 months	87	22.9	39	11.7	<0.001
Overall health rating					
Fair/Poor	169	44.5	134	40.1	0.442
Good/Very Good/Excellent	205	53.9	185	55.4	
Alcohol Use in prior 6 months	338	88.9	286	85.6	0.214
Heroin Use in prior 6 months	65	17.1	6	1.8	<0.001
Crack Use in prior 6 months	246	52.9	219	65.6	0.875
Cocaine HCl					
Use in prior 6 months	271	71.3	140	41.9	<0.001
DSM-IV Dependence	206	54.2	165	49.4	0.203
Methamphetamine					
Use in prior 6 months	229	60.4	113	34.0	<0.001
DSM-IV Dependence	121	31.8	37	11.1	<0.001
Marijuana					
Use in prior 6 months	355	93.4	251	75.1	<0.001
DSM-IV Dependence	141	37.1	60	18.0	<0.001
Injection Drug Use in prior 6 mo [*]	98	25.8	25	7.5	<0.001

^{*} cocaine, methamphetamine, prescription opiates or heroin injection

Table 3

Independent correlates of prescription opiate misuse in prior 6 months among rural stimulant users

	Rx Opiate Misuse ^a	
	aOR ^b	95% CI ^c
BSI Anxiety	2.04	1.60 – 2.59 **
Heroin use ^d	5.76	2.12 – 15.6 **
Cocaine use ^d	2.17	1.45 – 3.25 **
Methamphetamine use ^d	1.82	1.15 – 2.89 *
Marijuana use ^d	4.24	2.31 – 7.76 **
Any injection drug use ^d	2.02	1.09 – 3.74 *
Race/ethnicity ^e		
African American	0.40	0.23 – 0.70 **
Other race/ethnicity	0.61	0.22 – 1.67
Age	0.97	0.95 – 0.99 *
Site ^f		
Arkansas	0.40	0.23 – 0.70 **
Kentucky	0.63	0.38 – 1.05

*
p<0.05**
p<0.01***
p<0.001^aReferent group is no opiate use^bAdjusted Odds Ratio^c95% confidence interval^dDuring 6 months prior to baseline interview^eReferent group is white race^fReferent group is Ohio site