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Prescription opioid use, illicit drug use, and sexually transmitted infections among participants from a community engagement program in North Central Florida

Abenaa B. Acheampong, Catherine W. Striley, and Linda B. Cottler

Department of Epidemiology, College of Public Health and Health Professions and College of Medicine, University of Florida, Gainesville, FL, USA

Abstract

Introduction—The purpose of this analysis was to determine the intersection between prescription opioid use, illicit drug use and STIs amongst Alachua County participants.

Methods—Cross-sectional data come from 2,194 Alachua County community members interviewed by Community Health Workers (CHWs) from HealthStreet, a community engagement program of the University of Florida. Demographic characteristics, health risk factors and health conditions were obtained.

Results—Among participants, 9.3% reported ever having an STI, 40% reported lifetime use of prescription opioids, and 53% reported ever using an illicit drug. Persons who reported using an illicit drug or an illicit drug plus prescription were 2.89 and 4.12 times as likely to report one or more STIs respectively, compared to those who never used these drugs. Prescription opioid use alone was not statistically related to STIs though female gender (AOR 3.75), lower education (AOR 1.45) and food insecurity (AOR 1.52) were.

Discussion—Those who report a history illicit drug use with or without prescription opioid use are at increased risk for STIs and could benefit from prevention programs. Those with factors that are proxies for other disparities (lower education, food insecurity) are especially important targets for intervention among women.

Introduction

Each year, around 19 million people are diagnosed with Sexually Transmitted Infections (STIs) in the US, costing the nation \$16 billion in associated health care costs (CDC, 2013). Moreover, among developed nations, the US ranks first in STI rates (Stranger-Hall, et al 2011). In Alachua County, a prominent county in North Central Florida, rates of chlamydia and gonorrhea are significantly higher than national and state levels (Florida Department of Health, 2010).

Along with the high rates of STIs, Alachua County is also a high drug trafficking area (ONDCP, 2013). Studies have shown that an intersection between higher rates of risky

sexual behaviors such as unprotected sex, multiple sex partners, and drug use (Blankenship, Reinhard, & El-Bassel, 2015; Dyer et al, 2013; El-Bassel & Strathdee, 2015; Islam et al, 2013; Chorba et al, 2012; McHugh et al, 2012; Patrick et al, 2012; Shoptow et al, 2014). Specifically, the rates of prescription drugs used non-medically are rising, now becoming one of the leading substance used (Dunn et al, 2013; Benotsch et al, 2011; Lankenau et al, 2012; Mackey, Liang, & Strathdee, 2013). The non-medical use of prescription drugs has been linked with accessibility (Lankenau et al, 2013; Merlo, Cummings, & Cottler, 2014). In 2012, the most recent year CDC data is available, 259 million prescriptions were written for opioids, the most frequently misused prescription drug (CDC, 2014). Previous research have shown that prescription opioid abuse is not only associated with the use of illicit drugs, but is also associated with high risk sexual behavior (Buttram et al, 2013; Dunn et al, 2013; Kelly et al, 2013, Chorba et al, 2012; Church et al, 2011; Meade et al, 2010; Shoptow et al, 2014; Tetrault et al, 2010). Though some southern states, such as Florida, have been able to curtail its former prescription opioid prescribing rates with prescription monitoring systems, the highest prescribing states of opioids are in the South, with some states bordering Florida, which can provide an alternative avenue to obtain these drugs (CDC, 2014; Sauber-Shatz et al 2013). Since many prescription opioid users also use other illegal substances, it is important to delineate the extent in which STIs are attributed to prescription opioid use and any potential multiplicative effect it has with the use of other illegal substances.

This analysis evaluates the intersection between lifetime prescription opioid use, illicit drug use, and lifetime STIs among community recruited participants from Alachua County. We determined differences in prescription opioid and illicit drug use amongst those who reported at least one lifetime STI compared to those who did not. Moreover, using a socio-ecological model, we assessed individual level risk factors such as age, food insecurity (used as a proxy for income), race, education level, gender, employment, marital status, and binge drinking, as they have been shown to be associated with STIs (CDC, 2011; McHugh et al, 2012; Lanier et al, 2013, Plefiger et al, 2013; Khan et al, 2012; Harling et al, 2008; Solomon et al, 2008). We aimed to provide more information on illicit drug and prescription opioid use in the understudied rural populations, especially since negative outcomes attributed to prescription drug use are linked with rural residence (Paulozzi, 2012).

The analyses focus on a variety of STIs; including those less commonly reported (herpes, genital warts, etc.) and also less frequently studied drugs (hallucinogens and amphetamines). In general, this analysis provides further information about the lifetime prevalence of STIs and comorbid prescription opioid and illicit drug use in North Central Florida, using to our knowledge, one of the largest datasets on illicit drug use and STIs collected from out of treatment North Central Florida residents. We hypothesize that there will be a dose-response relationship between prescription opioids, illicit drug use and STIs, where the odds of reporting at least one lifetime STI will be highest among those who used both prescription opioids and illicit drugs.

Methodology

Overall Outreach and Data Collection

The data used in this cross-sectional study comes from HealthStreet, a community-based program that reaches underrepresented populations in North Central Florida with a goal to reduce health disparities in healthcare and research. Participants were recruited from health fairs, grocery stores, bus stops, community events and other locations in North Central Florida (Cottler et al, 2013). CHWs, lay community members from the target communities, interviewed participants using the Health Intake questionnaire, developed and extensively piloted to ensure cultural relevance, clarity, and practicality (Cottler et al, 2013). Information in this analysis includes: self-reported history of current or previous STIs, illicit drug use, prescription opioid use, and general socio-ecological variables. Participants included in these analyses were 18–50 years of age who were interviewed with the University of Florida IRB approved informed consent and Health Intake form (N=2,194).

Main Exposure

To identify lifetime prescription opioid use, participants were asked: “Have you ever used prescription pain medications such as Vicodin, Oxycodone, Codeine, Demerol, Morphine, Percocet, Darvon, or Hydrocodone?” To assess illicit drug use, participants were asked a series of six questions in the format of “Have you ever used: a club drug like ecstasy GHB, or Ketamine? Cocaine or crack? Marijuana? Heroin? Speed or Amphetamines? Hallucinogens?” Each was coded yes or no. A composite illicit drug variable, categorizing respondents who reported ever using an illicit drug versus those not reporting any illicit drug, was created from these questions and used as an exposure variable.

A four level lifetime composite variable was also created: participants who reported no use of prescription opioids or illicit drugs, participants who reported prescription opioid use only, participants who reported one or more illicit drug only, and participants who reported both prescription opioid and illicit drug use.

Main Outcome

To assess any lifetime STI, six questions were asked: “Have you ever been told you had, or have you ever had a problem with: Chlamydia? Gonorrhea? Herpes? HIV/AIDS? HPV? Syphilis?” A composite STI variable was also created categorizing participants who reported ever having at least one STI versus those who did not report any STI of interest.

Covariates

Socio-ecological factors examined in this analyses included: age (18–25 vs. 26+), race (white vs. non-white), education (12 years of completed education vs. less than 12 years), food insecurity (food insecure in the past 12 months vs. no food insecurity in the past 12 months), employment (employed full-time or part time vs. unemployed), marital status (never married vs. married, separated or divorced or widowed vs. married), binge drinking (4 or more drinks like beer, wine, liquor, in a single day for men or 3 or more drinks like beer, wine, liquor in a single day for women, in the past 30 days vs. less than 4 for men and less than 3 for women).

Results

Sample Characteristics

Of the 2,194 participants, 62.6% (n=1375) self-identified themselves as non-white, 55.1% were female (n=1207), 31.2% (n=686) reported to be between the ages of 18 and 25, and 82.2% (n=1804) reported that they were never married. In regards to socio-ecological variables, 56.9% (n=1248) were not employed, 78.9% (n=1729) reported having a high school degree or above and 44.5% (n=973) experienced food insecurity in the past 12 months prior to their interview. Binge drinking within the last thirty days prior to completion of the Health Intake was reported by 27.8% (n=610) of participants. Additionally, 40% of participants reported lifetime prescription opioid use and 53% reported lifetime use of an illicit drug. With our composite variable, 31.7% (n=696) never used prescription opioids or an illicit drug, 15.4% (n=337) reported lifetime use of prescription opioids only, 27.9% (n=612) reported lifetime use of an illicit drug only, and 25.0% (n=549) reported lifetime use of both prescription opioids and illicit drugs.

Distribution of STIs and Demographic Information

As shown in Table 1, a total of 238 STIs reported from 204 (9.3%) individuals, indicated that some reported more than one lifetime STI. From the reported STIs, chlamydia was the most common (4.5%), with 98 cases representing 48% of all reported STIs. Other common STIs were HPV and gonorrhea, which comprised 22.5% and 20% of the reported STIs. The reported lifetime prevalence was 2.1% and 1.9% of the total sample respectively. Other reported STIs among those who have had an STI were herpes (12.3%), HIV/AIDS (7.8%), genital warts (7.4%), and syphilis (6.4%).

Shown in Table 2 are associations between each variable and STI status. Participants who reported at least one STI were more likely to be female, food insecure in the past 12 months, less educated, and not currently married. No differences were found for minority group status, age, employment, or binge drinking.

Illicit Drug Use and Prescription Opioids

Except for inhalants and heroin, which were more rarely reported by our participants, all illicit substances were reported at higher rates among persons with a history of STI compared to those without such a history. The most commonly reported illicit drug used was marijuana (69.6 vs. 47.8%), followed by cocaine (33% vs. 10.9%). Due to the low base rate, there were no differences noted for heroin or inhalants.

History of STI was also associated with prescription drug use and opioid use. Specifically, 74.2% of those reporting an STI (p value<.0001) reported some illicit drug use vs 50.8% of those without an STI. Over half (52.5%) of those with a history of STI reported some prescription opioid use, either alone or in combination with use of prescription opioids versus 39% among those without an STI. STIs were strongly significantly associated with the concomitant use of both prescription opioids and illicit drugs (42.2% vs. 23.3%).

Crude and Adjusted Associations

Female gender was the strongest bivariate variable predicting STI with a crude odds ratio of 3.08. Food insecurity and less than 12 years of education were both associated with reporting one or more STIs with an OR of 2.02 and 1.68 respectively (Table 3). In regards to marital status, those who were never married or divorced, separated, or widowed had over twice the odds of reporting one or more STIs than participants who were married.

Cocaine was strongly associated with STI history with an OR of 4.11, whereas in the two by two tables marijuana was most common among person with an STI. Club drugs and inhalants were also found to be significantly associated with STI history. Those who used an illicit drug, with or without a prescription opioid had from 2.47 to 3.85 times the odds of reporting one or more STI suggesting the combination of the two is the most strongly associated with STIs. History of prescription opioids without illicit drug use was not a significant predictor of an STI (See Table 4).

This association between illicit drug use only, the combination of prescription opioid use and illicit drug use, female gender, and STIs not only held true in the multivariate model, but also increased in strength with AORs of 2.89, 4.12, and 3.75 respectively. Food insecurity in the past 12 months and less than 12 years of education were also still significant in the multivariate model, however, these variables lost strength in the association with AORs of 1.52 and 1.45 respectively. Age, minority status, and binge drinking were not statistically significantly associated with STIs. The individual illicit drugs shown in Table 3 were not included in the multivariate regression model as they were already included in the composite drug variable.

Discussion and Conclusions

We explored the association between illicit drugs, prescription opioids, and lifetime STIs among participants in a community engagement program in North Central Florida. In this sample of community recruited participants, the rate of STIs, including genital herpes, HIV/AIDS, chlamydia, genital warts, gonorrhea, HPV, and syphilis was 9.3%. Our analysis showed that reporting one or more lifetime STI was associated significantly associated with lifetime illicit drug use with or without lifetime use of prescription opioids, adjusting for various socio-ecological variables. These results give further support for the intersection of substance use, especially the association with the combination of illicit drug use and prescription opioid use. Specifically, there was a dose-response relationship between STIs and severity of drug use, with persons who reported both illicit drugs, and prescription opioids being likely to report having one or more STI compared to those who used and illicit drug only. There were no significant associations with STIs among persons who used only prescription opioids or reported no use of any drugs. The lack of significance may be due to the fact that our question assessing prescription opioid use was not a strong decipher of prescription opioid misuse, our results may have been different if we had a definitive question assessing misuse. Moreover, we found that the association between illicit drugs and STIs is not uniform in strength. Cocaine and club drug users had the highest odds of having an STI at 4.15 and 2.93 respectively. The lack of statistical significance between STIs and heroin may have been due to a small size of the sample that used heroin.

Our multivariate model also found significant relationships with social determinants of health. In regards to gender, women had more than 3 times the odds of reporting an STI compared with men. This follows the CDC data showing that women are more prone to contract STIs compared to their male counterparts (CDC, 2011). A recent study showed that women who used alcohol and other illicit drugs had an STI rate of 7.9%, compared to their male counterparts of 1.5% (McHugh et al, 2012). This suggests and corroborates with other studies that call for more female targeted STI prevention and testing in general (Blankenship, Reinhard, & El-Bassel, 2015; El-Bassel & Strathdee, 2015). Our finding that those with 12 or more years of education had decreased odds of an STI has been reported previously (Solomon et al, 2008; Harling et al, 2013). Food insecurity and its association with STIs might be a proxy for poor health and other risk behaviors (Cottler et al, 2014).

A lack of disparity in lifetime STI rates by race may be due to the fact that 68% of our sample was non-white. It was also unexpected that those 25 years of age or younger did not report significantly higher rates of the STIs than the other age groups, since the age group with the highest rates of the most commonly reported STIs is the 20–24 year age group (Khan et al, 2012; CDC 2010). Of particular note, binge drinking was not associated with having one or more STIs in this sample, which is surprising since Khan et al found that binge drinking was associated with self-reported STIs. The discrepancies between our results and other results reported may be due to the fact that our study assessed lifetime reported STI rates rather than rates of current infection, while binge drinking was assessed in the past 30 days.

Overall, results of these analyses did support our first hypothesis which predicted that the odds of reporting an STI will be greater amongst those who reported using both prescription opioids and illicit drugs. In general, reporting of drug use in our sample was high. These findings suggest that those who are known to use these drugs should be further probed to see if STI testing should be done. Also, those who have a history of opioid and illicit drug use may benefit from STI prevention programs.

Limitations

There are several limitations to these analyses. First, because the sample is cross-sectional, it may not find temporal relationships. Moreover, substance use questions did not delve into quantity/frequency or if participants used prescription opioids medically or non-medically. Additionally, participants were not selected at random. While the majority of Alachua County residents are Caucasian, the majority of people reached by Health Street are minority, which suggests a selection bias. Furthermore, Alachua County is home to the 8th largest universities in the nation, however, our sample comprised of Alachua County residents and very few college students. Thus, the findings of the study may not be generalizable to the Alachua County as whole or other college town populations. While these findings are both surprising and interesting, further longitudinal research in representative samples is warranted.

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Table 1

Self-reported lifetime prevalence of STIs

STIs	% Among those with an STI (N=204)	% Among Total Sample (N= 2194)
Herpes	25 (12.3%)	1.1%
HIV/AIDS	16 (7.8%)	0.7%
Chlamydia	98 (48.0%)	4.5%
Genital Warts	15 (7.4%)	0.7%
Gonorrhea	41 (20.0%)	1.9%
HPV	46 (22.5%)	2.1%
Syphilis	13 (6.4%)	0.6%
Any STI	204 (100%)	(9.3%)

Table 2

Socio-demographic characteristics of the HealthStreet Sample by Self-Reported History of Sexually Transmitted Infection(s) (STI)

	No STI (N=1990 or 90.7%)	1 or more STIs (N=204 or 9.3%)	p value
General Characteristics			
Non-White vs. White	1249 (62.8%)	126 (61.8%)	NS
Female vs. Male	1049 (52.7%)	158 (77.5%)	<.0001
18–25 vs. 26+	623 (31.3%)	63 (30.9%)	NS
Unemployed vs. Employed	1125 (56.5%)	123 (60.3%)	NS
Food insecure in past 12 months vs. None	853 (43.0%)	123 (60.3%)	<.0001
>12 or more years of education vs. <12	405 (20.4%)	60 (29.4%)	<.003
Binge drinking in past 30 days vs. None	545 (27.4%)	65 (31.9%)	NS
Marital Status			
Never Married	1283 (64.5%)	140 (68.6%)	<.004
Married	370 (18.6%)	20 (9.8%)	
Divorced, Widowed, or Separated	337 (17.0%)	44 (21.6%)	
Individual Illicit Life-time Drug Use			
Club Drugs	152 (7.6%)	40 (19.6%)	<0.0001
Cocaine or Crack	216 (10.9%)	68 (33.3%)	<0.0001
Marijuana	952 (47.8%)	142 (69.6%)	<0.0001
Heroin	31 (1.6%)	7 (3.4%)	NS
Speed/Amphetamines	77 (3.9%)	16 (7.8%)	0.007
Hallucinogens	82 (4.1%)	23 (11.3%)	<0.0001
Inhalants	23 (1.2%)	5 (2.4%)	NS
Composite Life-time Illicit Drug and Prescription (Rx) Opioids			
No use of Rx opioids or illicit drugs	664 (33.4%)	32 (15.7%)	<0.0001
Use of Rx opioids only	316 (15.7%)	21 (10.3%)	
Use of illicit drug only	547 (27.5%)	65 (32.0%)	
Both Rx opioid and illicit drug use	463 (23.3%)	86 (42.2%)	

Table 3

Crude Predictors of Reporting One or More STIs

Variable	Odds Ratio	95% CI
General Characteristics		
Non-White vs. White	0.96	0.71–1.29
Female vs. Male	3.08	2.20–4.33
18–25 vs. 26+	0.98	0.72–1.34
Food insecure in past 12 months vs. None	2.02	1.50–2.72
>12 or more years of education vs. <12	1.68	1.18–2.25
Binge drinking in past 30 days vs. None	1.24	0.91–1.70
Marital Status		
Marital status: Divorced, Widowed, or Separated vs. Married	2.41	1.40–4.18
Marital status: Never Married vs. Married	2.09	1.25–3.27
Composite Illicit Drug and Prescription (Rx) Opioids		
Rx opioids only vs. None	1.38	.78–2.43
Illicit drug use only vs. None	2.47	1.59–3.82
Rx opioids and illicit drug use vs. None	3.85	2.52–5.88
Individual Illicit Life-time Drug Exposure		
Club Drugs	2.95	2.01–4.33
Cocaine or Crack	4.11	2.97–5.68
Marijuana	2.50	1.83–3.40
Heroin	2.25	.98–5.20
Speed/Amphetamines	2.12	1.21–3.70
Hallucinogens	2.15	.81–5.71
Inhalants	2.96	1.81–4.81

Table 4

Predictors of Reporting One or More STIs among HealthStreet Sample (n= 2194)

Variable	Odds Ratios	95% CI
General Characteristics		
Race (Non-White vs. White)	1.13	0.82– 1.55
Gender (Female vs. Male)	3.75	2.62– 5.36
Age (18–25 yrs vs. 26+)	1.22	0.85–1.75
Food insecure (Past 12 months vs. None)	1.52	1.11– 2.08
Education (<12 years of education vs. >12)	1.45	1.04–2.03
Binge drinking (Past 30 days vs. None)	1.15	0.83–1.60
Marital Status		
Marital Status (Single vs. Married)	2.23	1.27–3.92
(Widowed, Separated, Divorced vs. Married)	2.10	1.25– 3.51
Composite Illicit Drug and Prescription (Rx) Opioids		
Rx Opioids only vs. None	1.32	0.74– 2.35
Illicit Drugs only vs. None	2.89	1.82–4.59
Illicit & Rx Opioids vs. None	4.12	2.62–6.46