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Heroin use onset among nonmedical prescription opioid users in the club scene

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ABSTRACT

Background: Nonmedical prescription opioid use (NMPOU) is well documented among participants in the club scene, yet prior studies have not examined transition to heroin use. We prospectively examined heroin initiation among a sample of young adults with drug involvement associated with participation in the club scene, to understand factors that influence transition from NMPOU to heroin and to identify opportunities for intervention.

Methods: Data were drawn from a randomized trial that enrolled 750 Miami-based club and prescription drug users through respondent driven sampling, and tested the efficacy of assessment interventions in reducing risk. Participants reported current substance use at baseline, 3, 6, and 12 month follow-ups. We examined predictors of heroin initiation among participants reporting NMPOU at baseline, with no lifetime history of heroin use (N = 323).

Results: The mean age was 25.0 years; 67.5% met DSM-IV criteria for substance dependence. About 1 in 13 participants (7.7%) initiated heroin use at follow-up. In univariable comparisons, frequent LSD use, history of drug overdose, high frequency NMPOU, using oral tampering methods, and endorsing a primary medical source for prescription opioids were associated with greater likelihood of heroin initiation. LSD use, oral tampering, and primary medical source were significant predictors in a Cox regression model.

Conclusions: Heroin initiation of 7.7% suggests a high level of vulnerability for transition among young adult NMPO users in the club scene. The importance of oral tampering methods in the trajectory of NMPOU may indicate a need to further examine the role of abuse deterrent formulations in prevention efforts.

1. Introduction

Nonmedical prescription opioid use (NMPOU) contributes to significant morbidity and mortality in the US (Compton et al., 2016), including dependence, overdose (Volkow and McLellan, 2016), exposure to blood-borne infections (Peters et al., 2016), and neonatal abstinence syndrome (Stover and Davis, 2015). Although the dramatic rise in NMPOU that occurred nationally from 1990 to 2010 has stabilized in recent years, the prevalence of prescription opioid use disorders and related mortality have continued to rise (Han et al., 2015; Martins et al., 2017). Young adults have been especially impacted: in 2014, 20.2% of 18–25 year olds reported lifetime NMPOU (Center for Behavioral Health Statistics and Quality, 2015), a higher prevalence than any other age group. National surveillance data also indicate that an increasing number of young adults are heavy prescription opioid users (Jones, 2013), which has been associated with higher drug problem severity and more rapid progression to dependence (Daniulaityte et al., 2006).

Recent efforts to characterize the evolving opioid problem indicate a broad shift from prescription opioids to heroin in many areas, with increasing rates of heroin use and heroin overdose seen nationally as early as 2009 (Cicero et al., 2014; Compton et al., 2016; Muhuri et al., 2013). To a large extent, this shift has occurred in an environment of increased efforts to reduce the adverse consequences of prescription opioids (Compton et al., 2016), including improved prescriber

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education (Alford et al., 2015; Office of National Drug Control Policy, 2014), strengthening of prescription drug monitoring programs (Brady et al., 2014; Davis et al., 2014; Surratt et al., 2014), targeted law enforcement activities (Florida Department of Law Enforcement, 2012; Hall, 2015; Surratt et al., 2014), abuse-deterrent opioid formulations (Cicero et al., 2012a), the development and implementation of opioid prescribing guidelines (Frieden and Houry, 2016), and stewardship programs in healthcare settings to reduce the supply of opioids (Ghafoor et al., 2013). Although there is evidence to suggest that these types of initiatives have contributed to reductions in NMPOU and diversion of prescription opioids (Delcher et al., 2015; Rutlow et al., 2015; Surratt et al., 2014) their role in rising heroin use is unclear. Observational data indicate that heroin use was increasing prior to many of these initiatives being implemented (Dart et al., 2015; Dasgupta et al., 2014).

A comprehensive understanding of the ordering, progression, transition, and/or co-occurring use of prescription opioids and heroin is lacking in the scientific literature, and represents an under-researched area with significant public health implications (Muhuri et al., 2013). National trend data demonstrate consistent connections between NMPOU and transition to heroin use, with heroin incidence some 19 times higher among those reporting prior nonmedical prescription opioid use than among those who do not (Muhuri et al., 2013). Adolescents and young adults appear to be especially vulnerable to the migration from prescription opioids to heroin (Cerdá et al., 2015; Palamar et al., 2016). Trend data from 2002 to 2014 documented a significant temporal increase in the odds of heroin use among young adults reporting prior non-medical prescription opioid use (Martins et al., 2017). Although strong evidence suggests clear linkages between the two phenomena (Carlson et al., 2016), it has been noted that heroin use among NMPO users is rare overall, and the transition to heroin use appears to occur at a low rate (Jones, 2013).

Emerging research is examining the intersections of NMPOU and heroin use to better understand the factors that may drive transitions. Carlson and colleagues (2016) conducted a prospective natural history study of young adult illicit prescription opioid users who at baseline were not opioid dependent and had no history of heroin use. Among this sample, 7.5% initiated heroin over a 36-month period. Key predictors of transition included route of opioid administration, early age of prescription opioid administration, and lifetime prescription opioid dependence (Carlson et al., 2016). Additional explanatory factors posited in prior research to impact this transition include frequency of NMPOU (Jones, 2013; Palamar et al., 2016), tolerance and dependence (Daniulaityte et al., 2006; Haracopos et al., 2016), market dynamics, and subjective aspects of the user experience (Cicero et al., 2014; Cicero and Ellis, 2015).

Route of administration appears to be an important contributor to the adverse health consequences associated with NMPOU (Katz et al., 2008; Surratt et al., 2011), including transition to heroin (Carlson et al., 2016). Non-oral routes of prescription opioid ingestion are not uncommon in samples of high school and college students, rural drug abusers and urban street drug users (Davis and Johnson 2008; McCabe et al., 2007, 2009; Surratt et al., 2011; Young et al., 2010) and club drug users (Buttram and Kurtz, 2016), and are associated with greater drug problem severity, including dependence and overdose, and sexual risk behaviors (Buttram and Kurtz, 2016). Because altered routes of administration provide faster drug delivery and onset, the reinforcing effects are intensified (Compton and Volkow, 2006), thereby increasing the vulnerability to addiction. Trajectory analyses of NMPOU suggest that individuals often initiate with oral use and move to more efficient routes, such as snorting and smoking, as tolerance develops (Compton et al., 2016).

Although national surveillance data and focused studies involving community samples of young adults provide evidence for a transitional pathway from NMPOU to heroin (Carlson et al., 2016; Martins et al., 2017), it is important to document rates of heroin initiation in potentially vulnerable targeted samples to identify potential need and opportunities for intervention. NMPOU is well documented among participants in the club scene (Inciardi et al., 2007; Kelly and Parsons, 2007; Kelly et al., 2015; Kurtz et al., 2005, 2013, 2017), yet prior studies have not systematically examined transition to heroin use among samples of club drug users. We prospectively examine the initiation of heroin use among a targeted sample of young adults with extensive, yet largely recreational, drug involvement associated with nightlife participation in the Miami club scene. Our key purposes are to investigate the initiation of heroin use over time among club goers who report NMPOU and to examine predictors of this transition that are potentially amenable to intervention.

2. Methods

2.1. Study site

Miami-Dade County, Florida is a large and ethnically diverse metropolitan area with a population of 2.6 million people, of whom 66.2% are Hispanic (U.S. Census Bureau, 2015). For decades Miami has been a key transportation hub and distribution center for illicit drugs (Allman, 1987; National Drug Intelligence Center, 2003; Portes and Stepick, 1993), and is a major presence in the U.S. East Coast club scene, having become well-known for trendsetting nightlife and club drug use (Brandt, 2003; Perrone, 2009). The Miami club scene is characterized by extensive poly-drug use among its largely young aged club-goers, typically including illicit drugs and nonmedical prescription drug use as features of the club going experience (Kurtz et al., 2005, 2013, 2017).

2.2. Study sampling plan

The data for this analysis were drawn from a prospective three-armed randomized controlled trial designed to recruit a sample of 750 Miami-based club-going participants and test the relative efficacy of alternative low-intensity assessment interventions in reducing drug use and sexual risk behaviors at 3, 6 and 12 month follow-up. Eligibility criteria for trial participation were: 1) ages 18–39; 2) reported use of illicit club drug(s) at least three times in the past 3 months; 3) reported nonmedical use of a psychoactive prescription medication at least once in the past 3 months; 4) heterosexual vaginal and/or anal sex in the past 3 months; 5) attendance at large local nightclubs at least once per month; 6) residence in metropolitan Miami; and 7) willingness to provide locator information. Endorsement of both past 90 day club drug use and nonmedical prescription drug use was required for inclusion in the intervention trial.

Study recruitment was conducted between September 2011 and November 2014 using respondent-driven sampling (RDS) techniques (Heckathorn, 1997). Seeds (initial respondents) were recruited through targeted outreach at Miami nightclub venues and contacts in the club scene derived from the authors' prior Miami-based field studies. Miami's club scene is comprised of an extensive network of large and small nightclubs clustered largely in the geographically contiguous areas of South Beach and the City of Miami, which have been mapped previously by the study investigators. Each seed and subsequent participant was provided with recruitment coupons to give to other potentially eligible drug users in their social network. Consistent with RDS procedures, each participant-recruiter in this study was limited to five coupons.

2.3. Study procedures

The study field office location was selected for accessibility to the primary transportation routes in Miami. Field staff were bi-lingual (English/Spanish) age-peers of the target population with at least a Bachelor's degree and one year of research experience, who were trained in all aspects of the research and human subjects' protocols.