Drug and Alcohol Dependence 153 (2015) 236–241

Contents lists available at ScienceDirect

Drug and Alcohol Dependence

journal homepage: www.elsevier.com/locate/drugalcdep

Is cannabis use associated with less opioid use among people who inject drugs?

Alex H. Kral[a,*], Lynn Wenger[a], Scott P. Novak[a], Daniel Chu[c,2], Karen F. Corsi[b,1], Diana Coffa[d], Brad Shapiro[d,e], Ricky N. Bluthenthal[c,2]

[a] RTI International, 351 California Street Suite 500, San Francisco, CA 94104, USA
[b] Department of Psychiatry, University of Colorado, Denver School of Medicine, 1557 Ogden St., Denver, CO 80218, USA
[c] Department of Preventive Medicine, Institute for Prevention Research, Keck School of Medicine, University of Southern California, Soto Street Building, SSB, 2001 N. Soto Street, 3rd Floor, Rm 302R, MC 9239, Los Angeles, CA 90032-3628, USA
[d] Department of Family and Community Medicine, University of California, San Francisco, CA, USA
[e] Department of Psychiatry, University of California, San Francisco, CA, USA

ARTICLE INFO

Article history:
Received 13 March 2015
Received in revised form 7 May 2015
Accepted 9 May 2015
Available online 22 May 2015

Keywords:
Cannabis
Opioids
Injection drug use
PWID
Epidemiology

ABSTRACT

Background: Clinical, experimental, and ethnographic research suggests that cannabis may be used to help manage pain. Ethnographic research has revealed that some people are using cannabis to temper their illicit opioid use. We seek to learn if there is an association between cannabis use and the frequency of nonmedical opioid use among people who inject drugs (PWID).
Methods: PWID were recruited using targeted sampling methods in Los Angeles and San Francisco, California, 2011–2013. We limited analysis to people who used opioids in past 30 days ($N = 653$). Outcome variable: number of times used any opioids non-medically in past 30 days. Explanatory variable: any cannabis use past 30 days. Statistics: multivariable linear regression with a log-transformed outcome variable.
Results: About half reported cannabis use in the past 30 days. The mean and median number of times using opioids in past 30 days were significantly lower for people who used cannabis than those who did not use cannabis (mean: 58.3 vs. 76.4 times; median: 30 vs 60 times, respectively; $p < 0.003$). In multivariable analysis, people who used cannabis used opioids less often than those who did not use cannabis (Beta: −0.346; 95% confidence interval: −0.575, −0.116; $p < 0.003$).
Conclusions: There is a statistical association between recent cannabis use and lower frequency of nonmedical opioid use among PWID. This may suggest that PWID use cannabis to reduce their pain and/or nonmedical use of opioids. However, more research, including prospective longitudinal studies, is needed to determine the validity of these findings.

1. Introduction

The therapeutic applications of cannabis were first documented in the oldest known pharmacopeia, written by the Emperor of China, Shen Nung in 2737 BC, where it was recommended for over a wide variety of ailments, from gout to parasitic infections (Li, 1974). Since that time, there has been a stream of medical claims that cannabis eases limb-muscle spasms, is an effective analgesic and has antianxiety and antiemetic properties (Baker et al., 2003), Cannabis was part of the American pharmacopeia for much of the 19th and early 20th centuries, until the US federal government began restricting its use in the late 1930s (Bostwick, 2012), In 1970, the US Congress categorized cannabis as a Schedule I drug under the Controlled Substances Act, declaring it to have high abuse potential and no medical value, thereby rendering its use illegal (Cohen, 2010).

The past two decades has seen an increase in debate about the use of cannabis for medicinal purposes, with California becoming the first U.S. state to authorize medicinal cannabis in 1996 (O'Connell and Bou-Matar, 2007). To date, twenty-three states and the District of Columbia have passed laws that allow adult use of

* Corresponding author. Tel.: +1 415 407 0752; fax: +1 415 848 1330.
E-mail addresses: akral@rti.org (A.H. Kral), rbluthen@usc.edu (D. Chu), Karen.Corsi@ucdenver.edu (K.F. Corsi).
[1] +1 720 942 1804.
[2] +1 323 442 8236.

http://dx.doi.org/10.1016/j.drugalcdep.2015.05.014
0376-8716/

medical cannabis (Portal Labs, 2014). Additionally, as of February, 2014, four states – Alaska, Colorado, Oregon, Washington – and the District of Columbia, have legalized possession, manufacture and sale of cannabis for people 21 years of age and older to use recreationally (Merica, 2014).

There is a growing body of literature documenting the therapeutic benefits of cannabis (Bostwick, 2014; Grotenhermen and Muller-Vahl, 2012; Kalant, 2014; Lucas, 2012; Walsh et al., 2013). Reports of improved appetite and reduction in muscle pain, nausea, anxiety, depression and paresthesia have been associated with cannabis use among people with HIV (Woolridge et al., 2005). Cannabis use for pain relief is also common among people living with chronic non-cancer pain (Degenhardt et al., 2014). In addition to pain relief, individuals who use cannabis for therapeutic reasons report effective symptom relief for anxiety and sleep disturbances (Walsh et al., 2013). Cannabis may also act to relieve inflammation and has been found to have a useful place in the treatment of rheumatic diseases (Kalant, 2014). Multiple review articles have systematically documented the therapeutic potential of cannabis as treatment for nausea, loss of appetite in HIV and cancer patients, spasticity in multiple sclerosis and spinal cord injuries, neuropathic pain, non-neuropathic pain, Tourette syndrome, and glaucoma (Abrams et al., 2011; Ben Amar, 2006; Grotenhermen and Muller-Vahl, 2012; Kumar et al., 2001; Raby et al., 2009; Robson, 2001).

Due to potential side effects (including overdose) associated with opioid use (Centers for Disease Control and Prevention, 2011) and the decrease in analgesic efficacy over time (Lee et al., 2011), there is a need to explore alternative medications to opioids in the management of severe pain. While controversial, cannabis is being explored as a possible complement (Abrams et al., 2011) or alternative to opioids for reducing pain (Carter et al., 2015; Elikkottil et al., 2009; Lucas, 2012). Clinical and pre-clinical studies have documented the synergistic relationship between opioids and cannabis. In a review article, Elikkottil et al. (2009)) assessed the synergistic relationship between opioids and cannabis in both experimental studies with mice and rats and clinical studies with healthy subjects. They conclude that combining smaller doses of cannabis and opioids resulted in positive analgesic effects with fewer side effects than a larger dose of either drug alone. Abrams et al. (2011) also found that among chronic pain patients who were treated with opioids, vaporized cannabis augments the analgesic effects of opioids, which may allow for opioid treatment at lower doses with fewer side effects. Similar to clinical and experimental research, data from a community-based study of people who have been prescribed opioids for chronic non-cancer pain found that cannabis use for pain relief purposes was common and that study participants reported greater pain relief in combination with opioids than when opioids were used alone (Degenhardt et al., 2014).

Qualitative studies have recently found that people who use heroin report that they are able to temper or reduce their heroin use by using cannabis. In a sample of street-recruited PWID, study participants reported smoking cannabis to reduce anxiety and cravings experienced while transitioning away from daily heroin use (Wenger et al., 2014). In another qualitative study, Peters found that medical cannabis patients consistently reported using cannabis to substitute or wean off prescription opioids (Peters, 2013). All patients who were taking opioids reported reducing their overall drug use, specifically opioids, by using cannabis. Patients also reported that cannabis was preferred over opioids, eased withdrawal from opioids, and in some cases was more effective in relieving pain.

In this paper, we test whether there is a statistical association between cannabis use and the frequency of nonmedical opioid use in a large cross-sectional sample of street-recruited PWID.

2. Methods

2.1. Study procedures

We used targeted sampling methods to recruit PWID in Los Angeles and San Francisco, California, USA (Bluthenthal and Watters, 1995; Kral et al., 2010; Watters and Biernacki, 1989). Eligibility criteria included injection drug use in the past 30 days and being 18 years of age or older. Study staff verified that potential participants had injected drugs by inspecting them for signs of recent venipuncture ("tracks"; Cagle et al., 2002). Each participant went through an informed consent process before enrolling in the study. The study involved a quantitative survey interview which served the dual purposes of collecting quantitative data on a large sample of PWID and providing study staff with information about eligibility into a sub-study that involved a qualitative interview. We only report on results of the quantitative survey in this manuscript. The survey involved a one-on-one, computer-assisted personal interview (CAPI) conducted by a trained interviewer which lasted between 30 and 45 min (Questionnaire Development System, NOVA Research, Bethesda, MD). After completion of the survey, participants were remunerated $20. All study procedures were approved by the Institutional Review Boards at the two institutions where the research was carried out: University of Southern California and RTI International.

2.2. Study sample

The study was conducted between April, 2011 and April, 2013 in Los Angeles and San Francisco, during which time 777 PWID completed the quantitative survey. Because this analysis involves assessing whether the frequency of opioid use among PWID is different from those who use cannabis and those who do not use cannabis, we restricted the sample to the 653 PWID who reported any (a) use of heroin alone or in combination with other drugs (including cocaine or methamphetamine) or (b) nonmedical use of opioid pills or methadone.

2.3. Study measures

Our outcome variable was the number of times a participant used opioids in the past 30 days (people could use opioids many times per day). This variable was the sum of the answers to questions about the number of times in the past 30 days that the participant reported using heroin (injected and non-injected), "speedball" (mix of heroin and cocaine, injected and non-injected), "goofball" (mix of heroin and methamphetamine, injected and non-injected), non-prescribed methadone (used), and nonmedical use of opiate pills (injected and non-injected). Our explanatory variable was whether the participant responded yes to the question "Have you used marijuana in the last 30 days?" Note that we used the word "marijuana" in the survey instrument, as opposed to cannabis, because this study took place in California, USA, where marijuana is the most common term for cannabis. The following factors were candidate confounding variables: socio-demographic and socioeconomic characteristics, including., age, gender, housing status, income, and sexual orientation, study site (Los Angeles or San Francisco), drug use history (years of injection), recent (last 30 days) crack cocaine, powder cocaine, methamphetamine, alcohol use, and health-related items such as mental health diagnoses, HIV status, health insurance, and drug treatment experience.

2.4. Statistical analysis

We used descriptive statistics (e.g., frequencies, means, standard deviations, medians, interquartile ranges) to examine all