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Cannabis use disorder and male sex predict medical cannabis card status in a sample of high risk adolescents

Janet Kim[a], Marilyn E. Coors[a], Susan E. Young[a], Kristen M. Raymond[a], Christian J. Hopfer[a], Tamara L. Wall[b], Robin P. Corley[c], Sandra A. Brown[b], Joseph T. Sakai[a,*]

[a] University of Colorado School of Medicine, 13001 E 17th Place, Aurora, CO, 80045-2559 United States
[b] University of California San Diego, 9500 Gilman Drive, La Jolla, CA, 92093-0001 United States
[c] University of Colorado, Boulder, I.B.G. 447 UCB, 1480 30th St, Boulder CO, 80309-0447 United States

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ABSTRACT

Objective: To examine if a substance use disorder (SUD), especially cannabis use disorder in adolescence, predicts future medical cannabis card status among high-risk youth.

Methods: Data collection occurred in Denver and San Diego. We recruited adolescents, with or at high risk for SUD and conduct problems (hereafter probands) and their siblings (n = 654). Baseline (Wave 1) assessments took place between 1999 and 2008, and follow-up (Wave 2) took place between 2010 and 2013. In initial bivariate analyses, we examined whether baseline DSM-IV cannabis abuse/dependence (along with other potential predictors) was associated with possessing a medical cannabis card in young adulthood (Wave 2). Significant predictors were then included in a multiple binomial regression. Self-reported general physical health was also evaluated at both time points. Finally, within Wave 2, we tested whether card status was associated with concurrent substance dependence.

Results: About 16% of the sample self-reported having a medical cannabis card at follow-up. Though bivariate analyses demonstrated that multiple predictors were significantly associated with Wave 2 card status, in our multiple binomial regression only cannabis abuse/dependence and male sex remained significant. At Wave 2, those with a medical cannabis card were significantly more likely to endorse criteria for concurrent cannabis dependence. There was no significant difference in self-reported general physical health.

Conclusions: Cannabis abuse/dependence and male sex positively predicted future medical cannabis card holder status among a sample of high risk adolescents. Physicians conducting evaluations for medical cannabis cards should carefully evaluate and consider past and concurrent cannabis addiction.

1. Introduction

In recent decades, there has been a shift in the legal perspective in the United States regarding cannabis use. In 1996, California enacted the Compassionate Use Act, becoming the first state to legalize medical cannabis (People of the State of California, 1996). Many states followed suit, including Colorado with passage of Amendment 20 to the state constitution in 2000, and as of August 2017, 29 states and D.C. have medical cannabis laws (MMLs; ProCon, 2017). However, individuals in these states can still be charged for cannabis-related crimes under federal law because the Drug Enforcement Agency schedules cannabis as a Class I substance and because Federal law considers possession and distribution of cannabis a crime (USDEA, 2016). Between 2001 and 2008 medical cannabis participation was "relatively low and flat" (Fairman, 2016). But in 2009, the Department of Justice issued the Ogden Memorandum, which stopped the Federal prosecution of "individuals whose actions are in clear and unambiguous compliance with existing state laws providing for the medical use of cannabis" (Ogden, 2009). Starting in 2009, some states experienced rapid growth of their medical cannabis registries (Fairman, 2016; Schuermeyer et al., 2014). For example, in Colorado between 2001 and 2008 a total of only 6704 new patients applied for a medical cannabis card (The Colorado Medical Marijuana Registry, 2009). In 2009, Colorado saw a dramatic increase in the number of cardholders and by the end of 2010, 116,198 people held medical cannabis cards (The Colorado Medical Marijuana Registry, 2010). Unfortunately, some states do not release state registry data or do not require registration (e.g., California's medical cannabis registry is voluntary; Bowles, 2012), making monitoring of prevalence of medical cannabis participation challenging. In 2012, Colorado legalized recreational cannabis use for adults, though the first

* Corresponding author at: University of Colorado School of Medicine, 13001 E 17th Place, Aurora, CO, 80045-2559, United States.
E-mail address: joseph.sakai@ucdenver.edu (J.T. Sakai).

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recreational sales did not begin until January of 2014. As of August 2017, eight states, including California, have legalized recreational cannabis (NORML, 2016). Thus studying medical cannabis card status during years 2010–2013 in Colorado and California, as we do here, allows examining a period which comes after the issuance of the Ogden-Memo but is prior to the initiation of legal recreational cannabis sales in either state.

There has been keen interest in understanding whether this shifting legal landscape may lead to changes in cannabis use patterns and cannabis use disorder prevalence among adolescents and adults in the general population (Cerdá et al., 2012; Hasin et al., 2017; Hasin et al., 2015; Martins et al., 2016; Wall et al., 2011; Wen et al., 2015). Similarly, there has been interest in understanding whether use of medical cannabis is related to high prevalence of substance use disorders and non-cannabis substance use. For example, Grella et al. (2014) found that about half of their sample of medical cannabis users had engaged in risky alcohol use and about 20% had used illicit drugs in the past 30 days. Zaller et al. (2015) report that one-fifth of their medical cannabis patient sample reported previous treatment for drug/alcohol dependence. In contrast, several other studies have found that medical cannabis users have similar or lower rates of other drug use (Reinarman et al., 2011; Roy-Byrne et al., 2015), though relative levels of course depend on the identified comparison group and various comparison groups have been utilized in studies of medical cannabis patients (Bohnert et al., 2014; Haug et al., 2017; Ilgen et al., 2013; Lankenau et al., 2017a,b). One criticism of the current literature is that studies to date have generally utilized cross sectional designs, mainly recruiting subjects from a single (e.g., Haug et al., 2017; Ilgen et al., 2013) or multiple medical cannabis dispensaries (Kepple et al., 2016; Reinarman et al., 2011), through chain referral sampling (Lankenau et al., 2017a,b) or through health care settings (Davis et al., 2016; Richmond et al., 2015; Roy-Byrne et al., 2015). While some work supports that recruitment from dispensaries does not introduce substantive sampling or respondent biases (Thomas and Freisthler, 2016), others have suggested that asking medical cannabis users about other substance use in the context of recruitment at a medical cannabis assessment center might encourage under-reporting of other drug use (Reinarman et al., 2011). Concurrent assessment of other drug use after ascertainment at dispensaries might also potentially cause under-reporting because medical cannabis users are concerned with, and commonly experience, high levels of stigma (Satterlund et al., 2015). In addition, cross-section designs cannot disentangle temporal relationships (e.g., early cannabis use predicts later medical cannabis use or vice versa). One possibility that has not yet been well investigated, is that medical cannabis may serve as a convenient way for those with a cannabis addiction to access cannabis. Here we utilized a longitudinal sample, with baseline assessments in 2008 and prior years, and Wave 2 assessments in 2010–2013. We hypothesized that those with a cannabis use disorder at baseline assessment would be more likely to have a medical cannabis card at follow up. Mirroring the approach of prior studies (Grella et al., 2014; Reinarman et al., 2011), we additionally utilized Wave 2 cross-sectional data to assess whether those accessing medical cannabis have relatively high rates of concurrent substance use disorders.

One confound of testing the relationship between early cannabis use disorder and later medical cannabis use is that at baseline cannabis might have been used to mitigate general medical or mental health concerns. In other words, early health concerns might drive both early cannabis use and future medical cannabis use. There is currently moderate quality evidence supporting that cannabinoids benefit spasticity and chronic neuropathic or cancer-related pain, but evidence for other indications is of low quality (Whiting et al., 2015). One recent review also found limited evidence that cannabinoids used for medical concerns improve functioning and health-related quality of life, in part again because of limited high quality data (Goldenberg et al., 2017). The available literature on the promise of cannabinoids for various medical issues can be interpreted very differently by prominent and well-informed researchers e.g., (Haney and Evins, 2016), suggesting the importance of continued research in this area. Still, many patients use cannabis to help with various general medical and mental health concerns, including anxiety disorders, depression, and attention-deficit/hyperactivity disorder (Lucas and Walsh, 2017; Park and Wu, 2017), and report substituting medical cannabis for prescribed medications (Lucas and Walsh, 2017; Zaller et al., 2015). Although many medical cannabis users report past-year psychological distress (Grella et al., 2014) and adverse events from cannabinoids are common (McGriff et al., 2016; Whiting et al., 2015), many users also endorse subjective improvement in their symptoms from cannabis use (Grella et al., 2014; McGriff et al., 2016; Reinarman et al., 2011; Zaller et al., 2015) and report that side effects experienced are less than with prior trials of prescribed medications (Zaller et al., 2015). Thus, any study examining the longitudinal relationship between early cannabis use disorder diagnosis and later medical cannabis use, must also consider possible contributions from general medical and mental health concerns.

2. Methods

2.1. Sample

Subjects were recruited as part of a multi-site study on the genetic linkage of substance use disorders (SUDs) and conduct disorder (CD; Derringer et al., 2015). Data was collected both in Denver and San Diego and focused on adolescents, 13–19 years of age, with or at high risk for substance and conduct-related problems (hereafter referred to as probands) and their close-age siblings. In Denver, investigators recruited probands from (1) a University-based adolescent treatment program for youth with serious substance and conduct problems and (2) adjudicated youth from the Colorado criminal justice system. In San Diego, investigators recruited participants from (1) treatment programs and (2) high schools for behaviorally troubled youth.

Participants were excluded if they 1) presented with signs of psychosis, 2) obvious intoxication, 3) imminent dangerousness (i.e., current risk of suicide, violence or fire setting), or 4) exhibited insufficient English skills for assenting/consenting to the interview or completing the interview.

Baseline (Wave 1) assessments were completed between 1999 and 2008, and follow-up (Wave 2) assessments were conducted between 2009 and 2013. Questions regarding medical cannabis card status were added to the battery in 2010 and only those participants with this data (n = 654) were utilized in these analyses. The mean age of participants utilized in this study at Wave 1 was 17.3 years (SD = 3.1) and at Wave 2 was 24.1 years (SD = 2.5).

2.2. Attrition analysis

We compared the sample used in these analyses and those that were excluded from these analyses (i.e., some individuals targeted for follow up were not able to be seen at Wave 2 or were seen prior to the addition of the Medical Cannabis questions in 2010). Attrition analyses (see Table 1) indicated that both groups, those included in these analyses and those that were not, were similar in all measures except for the years the participants were tested.

2.3. Measures

2.3.1. Wave 1 baseline

At baseline, each participant completed the Composite International Diagnostic Interview Substance Abuse Module (CIDI-SAM), a structured diagnostic interview, which generates DSM-IV substance use disorder diagnoses for 10 drug categories and is validated for use with adolescents (Crowley et al., 2001). Adolescents completed the Diagnostic Interview Schedule for Children (DISC), while adult siblings (18+ years) completed the Diagnostic Interview Schedule (DIS). DISC/DIS