Drug and Alcohol Dependence 105 (2009) 71–75

Contents lists available at ScienceDirect

Drug and Alcohol Dependence

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

Correlates of later-onset cannabis use in the National Epidemiological Survey on Alcohol and Related Conditions (NESARC)

Arpana Agrawal*, Michael T. Lynskey

Washington University School of Medicine, Department of Psychiatry, 660 S. Euclid, CB 8134, Saint Louis, MO 63110, USA

ARTICLE INFO

Article history:
Received 17 March 2009
Received in revised form 9 June 2009
Accepted 10 June 2009
Available online 25 July 2009

Keywords:
Cannabis
NESARC
Late-onset

ABSTRACT

Background: Much of the research surrounding correlates of cannabis initiation has focused on adolescent and young adult populations. However, there is growing evidence that cannabis onset occurs later in life as well and little is known of the risk and protective influences that are associated with late-onset cannabis initiation.
Methods: We used data on 34,653 individuals that participated in both the first wave and the 3-year follow-up (3YFU) of the National Epidemiological Survey on Alcohol and Related Conditions (NESARC). Univariate and multivariate logistic regression was used to examine the association between cannabis initiation at 3YFU and socio-demographic, religious/pro-social and psychiatric measures. Analyses were also conducted in age bands to further distinguish across the lifespan.
Results: Of the 27,467 lifetime abstainers at wave 1509 had initiated cannabis use at 3YFU. Consistent associations between divorce, religious attendance, volunteer/community service, alcohol abuse/dependence, nicotine dependence and cannabis initiation were noted in the full sample and across age-bands.
Conclusions: Religious and pro-social activities are negatively associated with late-onset cannabis onset while divorce and alcohol and nicotine-related problems are positively associated with later onset.

1. Introduction

Cannabis remains the most widely used illicit psychoactive substance in developed nations (Degenhardt et al., 2008). In the United States, 2.1 million individuals aged 12 and older initiated use of cannabis in the past month with these past month rates peaking (16.4%) in those aged 18–25 years (Substance Abuse and Mental Health Services Administration (SAMHSA), 2005). Rates of lifetime and recent use of cannabis appear to have stabilized over the last decade, and while much is known about the predictors and sequelae of early-onset cannabis use (ages 17 and younger), sources contributing to onsets of cannabis use during adulthood remain largely unexplored.

A majority of cannabis-using older adults initiate their use in adolescence and early adulthood – the peak period of risk (Agrawal et al., 2006, 2007; Boden et al., 2006; Degenhardt et al., 2000; Vega et al., 2002; Wagner and Anthony, 2002a, 2002b; Wittchen et al., 2008) and over 50% continue to use cannabis into middle adulthood (Perkonigg et al., 2008). Across birth cohorts, while there have been fluctuations in mean age at first cannabis use, most individuals report onsets during adolescence and young adulthood (16–30 years) with declining age of initiation in more recent cohorts (Degenhardt et al., 2000), likely due to cohort effects. In those aged 15–54 years, first use of cannabis has been shown to peak at 18 years (Wagner and Anthony, 2002a), with few onsets after age 25 years and nearly no onsets after age 35 years (Vega et al., 2002). Thus, later-onset cannabis use, even though unusual, is a fairly unique phenomenon and little is known of its etiology.

In the current study, we use data from 34,653 U.S. adults who were first interviewed in 2001–2002 as part of the National Epidemiological Survey on Alcohol and Related Conditions (NESARC) (Grant et al., 2003b) and followed up, 3 years later (Grant et al., 2008). We examine the socio-demographic and psychiatric correlates of new onsets of cannabis use during the 3-year follow-up and examine whether the constellation of risk and protective influences vary when comparing those initiating prior to age 35 years and later onsets.

2. Materials and methods

2.1. Sample

National Epidemiological Survey on Alcohol and Related Conditions (NESARC) is a nationally representative sample of 43,093 participants aged 18–99 years (at Wave 1). Comprehensive details regarding the survey design and sample characteristics are available elsewhere (Grant et al., 2003b). Wave 1 was collected during 2001–2002 by the U.S. Bureau of the Census on behalf of the National Institute on Alcohol Abuse and Alcoholism and the sample includes data from adult, non-institutionalized U.S. citizens and non-citizens (including Alaska and Hawaii). Approximately 57% of the

* Corresponding author. Tel.: +1 314 286 1778; fax: +1 314 286 2213.
E-mail address: arpana@wustl.edu (A. Agrawal).

0376-8716/$ – see front matter © 2009 Elsevier Ireland Ltd. All rights reserved.
doi:10.1016/j.drugalcdep.2009.06.017

sample was female and 19% was Hispanic (76% Caucasian), with an over-sampling for non-Hispanic Black households and for young adults aged 18–24 years. A 3-year follow-up (3YFU) interview has also been completed. A response rate of 86.7% (Ruan et al., 2008) for an effective sample size of 34,653, with exclusions due to death, deportation and mental or physical impairment was achieved. The cumulative response rate at Wave 2 was the product of this Wave 2 response rate and the response rate from Wave 1 (81.0%), or 70.2% and compare favorably with many cross-sectional studies.

Prior to each interview, written documents detailing the nature of the survey, its statistical uses, the voluntary aspect of participation, and the Federal laws that rigorously provide for the confidentiality of identifiable survey information were provided to each participant. Only consenting respondents were subsequently interviewed. The research protocol, including informed-consent procedures, received full ethical review and approval from the U.S. Census Bureau and the U.S. Office of Management and Budget.

The Alcohol Use Disorders And Associated Disabilities Schedule (AUDADIS-IV) was used to collect interview data from all individuals. The AUDADIS is a fully structured diagnostic interview, for self-report data, that can be administered by lay interviewers and/or clinicians. The AUDADIS diagnoses lifetime, past 12 month and prior to past 12 month diagnoses based on DSM-IV criteria and does not rely on skip-outs during assessments. The reliability and validity of assessments from the AUDADIS-IV are good and have been discussed in detail elsewhere (Grant et al., 2003a; Ruan et al., 2008).

2.2. Measures

Cannabis initiation was defined as use of cannabis (even once) at 3YFU in those who reported, during their Wave 1 interview, that they had never used cannabis during their lifetime. Of the 27,467 individuals who reported never using cannabis at Wave 1 (and were in the 3YFU sample with a non-missing response for cannabis initiation), 1.9% ($N = 509$) reported cannabis use at some point during the 3YFU while the others remained never users. Of the 509 users at 3YFU, 85 reported use prior to the past year alone while 83% ($N = 424$) reported using cannabis is the past year; 14% ($N = 71$) reported daily use, 15% ($N = 78$) reported weekly (but non-daily) use while others ($N = 275$) used it less frequently. When stratified by age (21–34 years or 35 years and older), those who were 21–34 years during initiation were more likely to report daily use in the past year (19.5% vs 12.9%) while those aged 35 years and older were modestly more likely to be weekly (19.1% vs 17.9%), monthly (23% vs 21%) or less frequent users. For these analyses, all 509 individuals, irrespective of their level of cannabis use, were considered to be 'new onsets'.

2.3. Correlates

Based on a review of the literature, a number of factors that have been previously shown to be correlated with initiation of cannabis use were examined in these analyses. The correlates could be broadly categorized into socio-demographic and psychiatric measures.

2.3.1. Socio-demographic measures were coded as follows

(a) Age, dichotomized as 34 years and younger;
(b) Sex;
(c) Self-reported Caucasian ethnicity;
(d) Living at/below the poverty line (at Wave 1 or 3YFU);
(e) Living (during 3YFU) in the Midwest/West/Southern Census regions (i.e. not in the Northwest);
(f) Urbanicity (at 3YFU) indexed by living in a Metropolitan Statistical Area;
(g) High school completion by 3YFU;
(h) Being a full/part-time student at 3YFU – measures representing educational attainment (being a student during 3YFU and having a GPA no less than B) and housing (being a student during 3YFU and not living with parents/relatives) were also included;
(i) Being employed during the 3YFU;
(j) Getting divorced or separated during the 3YFU;
(k) Having biological or adoptive children during 3YFU;
(l) Self-reported current good health;

2.3.2. Religious and pro-social activities were assessed using 3 items

(a) current attendance at religious services at 3YFU; (b) another item indexing that religious beliefs were 'very important' (assessed on a scale of 'very important' to 'not important') to the participant was also included; (c) being currently involved in regular volunteer activities or community service.

2.3.3. Psychiatric measures included lifetime (combined across Wave 1 and 3YFU)

DSM-IV diagnoses of major depressive disorder, generalized anxiety disorder, social phobia, specific phobias, panic disorder, mania, posttraumatic stress disorder, conduct disorder, attention deficit hyperactivity disorder, alcohol abuse/dependence and nicotine dependence. While the AUDADIS is not structured to assess serious psychotic illnesses, a self-report item on being diagnosed with schizophrenia/psychotic illness by a health professional was included. A measure assessing family history of drug or alcohol problems (father or mother had problems with 'drugs' or 'alcohol') was also included.

2.4. Statistical analyses

Univariate and multivariate logistic regression models were conducted in STATA (Stata Corp, 2003). All analyses were appropriately weighted, clustered on primary sampling units (PSU), and adjusted for strata (Grant et al., 2003b). All analyses were conducted using the *svy* options in STATA which allows for specification of design effects (weights, PSU and stratum). The *idonepsu* option was used to account for strata with single PSUs (Sarver, 2001). A stepwise selection process was used to retain significant correlates in the multivariate model.

3. Results

3.1. New onsets of cannabis use

Fig. 1 shows the number of new onsets of cannabis use for individuals at various ages during the 3YFU – the *x*-axis in Fig. 1 represents age at 3YFU (not age at initiation, which was not reported, however, had to have occurred in the 3 years of follow-up) – therefore, onset could have occurred in the 2 years preceding the interview our during the year of the interview. A majority of the new onsets were noted in those aged 21–25 years at 3YFU with fewer onsets in those aged 26–34 years. While they were infrequent, individuals aged 35–45 years also reported initiated cannabis use during the 3YFU.

3.2. Univariate associations

As seen in Table 1, a number of socio-demographic measures were associated with onset of cannabis use. Those initiating cannabis use during the 3YFU were more likely to be younger, male and living at or below the poverty line. They were also more likely to be students and/or employed. Religious attendance and participation in volunteer/community service were associated with a lower likelihood of cannabis initiation while experiencing divorce during the 3YFU was associated with an increased likelihood of cannabis initiation. All DSM-IV diagnoses were associated with an increased univariate likelihood (O.R. ranging from 1.45 to 5.56) of cannabis initiation as was family history of drug/alcohol problems and self-reported medical diagnosis of schizophrenia/psychotic illness.

3.3. Multivariate stepwise modeling

When modeled jointly (final column of Table 1), divorce, religious attendance, volunteer/community service as well as DSM-IV alcohol abuse/dependence, nicotine dependence, major depressive disorder, posttraumatic stress disorder and a medical diagnosis of

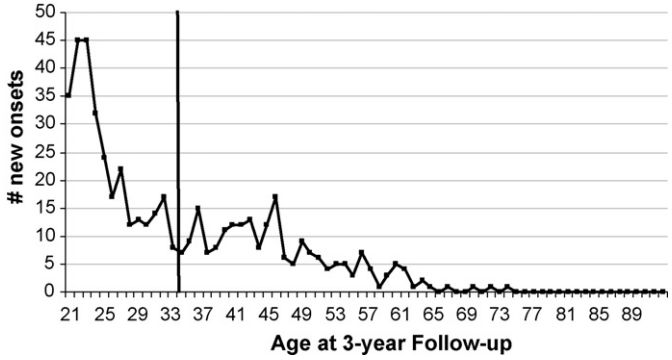

Fig. 1. Number of new onsets of cannabis use (a total of 509) during the NESARC 3-year follow-up (3YFU, conducted 2004–2005) by age at 3YFU. Note that the *x*-axis represents age at the interview – onset could have occurred in the same year as the interview or in the 2 years preceding the interview.