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Bipolar disorder and co-occurring cannabis use disorders: Characteristics, co-morbidities and clinical correlates

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ABSTRACT

This study examines rates of co-morbid mental disorders and indicators of the course of illness among individuals with bipolar disorder and cannabis use disorders (CUD). Data were drawn from the National Epidemiological Survey of Alcohol and Related Conditions (NESARC Wave 1, 2001–2002), a nationally representative sample of adults living in the United States. Among individuals with lifetime prevalence of bipolar disorder ($N=1905$) rates of CUD in the past 12 months were 7.2%, compared to 1.2% in the general population. Logistic regression models adjusting for sociodemographic variables indicated that individuals with bipolar disorder and co-occurring CUD were at increased risk for nicotine dependence (Adjusted Odds Ratio (AOR)=3.8), alcohol (AOR=6.6) and drug (AOR=11.9) use disorders, as well as antisocial personality disorder (AOR=2.8) compared to those without CUD. Among individuals with co-occurring CUD, age of onset of bipolar disorder was significantly lower and median number of manic, hypomanic and depressive episodes per year was significantly greater compared to individuals without CUD. Co-occurring CUD is associated with significant co-morbidities and a more severe course of illness among individuals with bipolar disorder. Comprehensive evaluation of patients with bipolar disorder should include a systematic assessment of CUD.

1. Introduction

Bipolar I and II disorders are serious mental illnesses that have been reported to occur in approximately 1–3% (Narrow et al., 2002; Grant et al., 2005) and 3–5% (Berk and Dodd, 2005; Cerullo and Strakowski, 2007) of the population, respectively. They are, globally, the sixth leading cause of disability (Woods, 2000). Bipolar disorders are often complicated by co-occurring substance use disorders, which are associated with increased co-morbidities (Gao et al., 2008). Cannabis is the most common illicit substance used among individuals with bipolar disorder (Cerullo and Strakowski, 2007) and up to 38% of individuals with bipolar disorder misuse cannabis (Etain et al., 2012). Cannabis abuse has particularly been reported to be high among young bipolar patients (Dell'Osso et al., 2011), and chronic cannabis use is associated with higher severity of illness and greater treatment non-compliance among individuals with bipolar disorder (van Rossum et al., 2009).

Despite numerous reports on co-occurrence between bipolar disorder and substance use disorders (see for example review by Cerullo and Strakowski (2007)), few studies have focused particularly on the relationship between CUD and bipolar disorder. In a longitudinal study by Strakowski et al. (2007), co-occurring CUD was found to be associated with more overall time in affective episodes and with more rapid cycling. Baethge et al. (2005) reported that in a prospective study on a clinical sample of bipolar patients, cannabis dependence was particularly associated with more manic episodes. Agrawal et al. (2011) reported results from a case-control study showing that co-occurring CUD was associated with increased suicide attempts, mixed episodes and disability.

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Nevertheless, data pertaining to characteristics and co-occurrence of cannabis use disorders (CUD) among individuals with bipolar disorder are still scarce. The aim of this study is to (a) report on characteristics of bipolar disorder and co-occurring CUD; (b) examine rates of co-morbid mental disorders among individuals with bipolar disorder and CUD; (c) examine bipolar-related indicators of course of illness among individuals with bipolar disorder and CUD. We used data from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) to examine the relationship between bipolar disorder and CUD. The NESARC is the largest epidemiological survey to-date on mental illness and substance abuse. In addition, it uses assessment tools which clearly differentiate primary mental disorders and substance-induced disorders. This is particularly important when exploring the association between bipolar disorder and CUD, as it is the only way to conclude whether CUD among individuals with bipolar disorder are associated with specific co-occurring mental disorders even when cannabis-induced mental disorders are ruled out.

2. Methods

2.1. Sample

We analyzed cross-sectional data from a population-based national representative sample, the National Epidemiological Survey of Alcohol and Related Conditions (NESARC) study (Wave 1, 2001–2002) (Grant et al., 2003b) conducted by the National Institute on Alcohol Abuse and Alcoholism (NIAAA). The interview was developed to advance measurement of substance use and mental disorders in large-scale surveys. Face-to-face interviews were conducted with 43,093 adults (response rate, 81%), aged 18 years and older from the civilian non-institutionalized population residing in the US, including the District of Columbia, Hawaii and Alaska. The NESARC sample was weighted to adjust for probabilities of selection of a sample housing unit or housing unit equivalent, the non-response at the household and person levels, the selection of one person per household and the oversampling of African-Americans, Hispanics and young adults (ages 18–24). The weighted data were post-stratified and adjusted to match the target population based on the 2000 decennial census in terms of region, age, sex, race and ethnicity (Huang et al., 2006). Details regarding sampling, purpose and weighting have been previously published (Grant et al., 2003a). Characteristics of interviewers, training and field quality control have been described elsewhere (Compton et al., 2004). The research protocol, including informed-consent procedures, received full ethical review and approval from the US Census Bureau and the US Office of Managament and Budget.

2.2. Diagnostic assessment

The Alcohol Use Disorder and Associated Disabilities Interview Schedule—DSM-IV Version (AUDADIS-IV) was used to assess substance use and psychiatric disorders (Grant et al., 2003b). This fully structured instrument, developed by the NIAAA for use in population-based epidemiological surveys, includes an extensive list of symptom questions that separately operationalizes DSM-IV criteria for substance use disorders and additional axis I and axis II diagnoses. The AUDADIS-IV has been reported to have excellent test–retest reliability of alcohol ($K=0.74$) and drug ($k=0.79$) use disorder, and good reliability ($k=0.59$) for bipolar disorder (Grant et al., 2005).

2.2.1. Definitions of bipolar disorder

Lifetime bipolar disorder included any lifetime bipolar I or II disorder and was defined according to the DSM-IV criteria (American Psychiatric Association, 2000), including any of the following: (a) at least one episode of hypomania and a lifetime major depressive episode (bipolar II) or (b) at least one manic or mixed episode, with or without lifetime major depressive episode (bipolar I). Bipolar disorder in the last 12 months was defined by any of the following: (a) hypomania in the last 12 months and lifetime major depressive episode; (b) mania in the last 12 months with or without lifetime major depressive episode or (c) depression in the last 12 months with lifetime mania or hypomania. We included only primary disorders and excluded all cases of substance-induced depressive and manic/hypomanic episodes as diagnosed in the AUDADIS-IV. Primary (non substance-induced) disorders were defined if: (1) the respondent did not use alcohol or drugs in the previous 12 months; (2) the episode(s) did not occur in the context of drug or alcohol intoxication or withdrawal; (3) the episode(s) started before initiation of drug or alcohol or (4) the episode(s) began after drug or alcohol consumption began, but persisted for more than 1 month after cessation of intoxication or withdrawal. Respondents were classified as having independent (primary) bipolar disorder if none or only some of their episodes were substance-induced (Grant et al., 2004).

2.2.2. CUD and cannabis-related variables

CUD referred to cannabis abuse and/or dependence in the last 12 months as defined by DSM-IV. Amounts of cannabis used were measured as number of joints consumed on days that cannabis was used in the last 12 months. Number of days of cannabis use in the last 12 months was calculated based on respondents answers when asked about frequency of cannabis use, given 10 possible answers ranging from "almost daily" to "once a year". In cases in which a range was offered in the answer (e.g. "3 to 4 times a week"), the middle of the range was chosen and multiplied by the appropriate measure (in the example given, $3.5 \times 365/7$).

2.2.3. Co-morbid mental illness

Any axis I disorders (including anxiety disorders and substance use disorders) referred to the last 12 months. Anxiety disorders included panic disorder, social anxiety disorder, specific phobia and generalized anxiety disorder. Diagnosis of a psychotic disorder was based on the question "Did a doctor or other health professional diagnose you with schizophrenia or psychotic illness or episode in the last 12 months?" This method has been used in previous studies and results echo accepted prevalence rates of schizophrenia in the North American population (Supina and Patten, 2006; McMillan et al., 2009). Substances included nicotine, alcohol and drugs. Drug use disorders referred to any drug (excluding cannabis) abuse or dependence. The substances included in this study were cocaine (including crack cocaine), heroin, hallucinogens, inhalants/solvents, sedatives, tranquilizers, opioids and amphetamines. Axis II disorders included any lifetime diagnosis of the following personality disorders: paranoid, schizoid, histrionic, antisocial, obsessive-compulsive, dependent, and avoidant personality disorders.

2.2.4. Physical disorders

As both physical and mental health-related quality of life (QoL) was assessed in this study, in addition to co-morbid mental disorders, prevalence of physical disorders was calculated and comparisons between individuals with and without CUD were conducted. Physical disorders in this study included a diagnosis of any of the following made by a health professional in the last 12 months: arteriosclerosis, hypertension, cirrhosis, other liver disease, angina pectoris, tachycardia, myocardial infarction, other heart disease, stomach ulcer, gastritis and arthritis.

2.3. Indicators of course of bipolar disorder

Age of onset of bipolar disorder was determined by age of onset of first depressive, manic or hypomanic episode. The average number of bipolar episodes per year was calculated by dividing the total number of lifetime depressive, hypomanic and manic episodes by number of years since onset of bipolar disorder. Rapid cycling in this study was defined as averaging four or more episodes per year since onset of bipolar disorder. Treatment utilization (i.e., "ever sought treatment for bipolar disorder") was defined as being treated by any of the following because of depressive, manic or hypomanic symptoms: treatment by counselor/therapist/doctor, overnight stay in hospital, referral to emergency room or prescription of medication by doctor.

2.3.1. Health-related QoL

The NESARC used the Short-Form 12-Item Health Survey, version 2 (SF-12), a short, efficient form of the SF Health Survey. It is a brief measure of functional health status, well-being and QoL, and has been shown to be particularly valid and useful in studies with large sample sizes (Ware et al., 1996). The SF-12 scoring employs a linear T-score transformation with a mean score of 50 and subscales and a standard deviation of 10 (Kosinski et al., 2007). We used the Physical Component Summary (PCS) and Mental Component Summary (MCS) of the SF-12. Higher values on all summary and subscale scores indicate better health-related QoL.

2.4. Statistical methods

Respondents with any 12 month bipolar disorder were examined with respect to sociodemographic characteristics (sex, age, educational level, household income, marital status, urbanicity, race/ethnicity and region). Prevalence of co-morbid psychiatric disorder among individuals with bipolar disorder with and without CUD in the last 12 months was calculated with cross-tabulations providing 95% confidence intervals. We used logistic regression to analyze the odds for any 12-month mental illness among individuals with bipolar disorder with and without CUD while controlling for sociodemographic characteristics. T-tests were used to compare continuous variables and χ^2 statistics were used to compare categorical variables throughout. In cases of significantly skewed