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Original article

Previous Use of Alcohol, Cigarettes, and Marijuana and Subsequent Abuse of Prescription Opioids in Young Adults

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A B S T R A C T

Purpose: There has been an increase in the abuse of prescription opioids, especially in younger individuals. The current study explores the association between alcohol, cigarette, and/or marijuana use during adolescence and subsequent abuse of prescription opioids during young adulthood.
Methods: We used demographic/clinical data from community-dwelling individuals in the 2006–2008 National Survey on Drug Use and Health. We used logistic regression analyses, adjusted for these characteristics, to test whether having previous alcohol, cigarette, or marijuana use was associated with an increased likelihood of subsequently abusing prescription opioids.
Results: Twelve percent of the survey population of 18–25 year olds (n = 6,496) reported current abuse of prescription opioids. For this population, prevalence of previous substance use was 57% for alcohol, 56% for cigarettes, and 34% for marijuana. We found previous alcohol use was associated with the subsequent abuse of prescription opioids in young men but not young women. Among both men and women, previous marijuana use was 2.5 times more likely than no previous marijuana to be associated with subsequent abuse of prescription opioids. We found that among young boys, all previous substance use (alcohol, cigarettes, and marijuana), but only previous marijuana use in young girls, was associated with an increased likelihood of subsequent abuse of prescription opioids during young adulthood.
Conclusions: Previous alcohol, cigarette, and marijuana use were each associated with current abuse of prescription opioids in 18–25-year-old men, but only marijuana use was associated with subsequent abuse of prescription opioids in young women. Prevention efforts targeting early substance abuse may help to curb the abuse of prescription opioids.

IMPLICATIONS AND CONTRIBUTION

Five million people abuse prescription opioids. We found that previous alcohol, cigarette, and marijuana use in boys, but only marijuana use in girls, was associated with abuse of prescription opioids in young adults. Prevention efforts targeting early substance abuse may help to curb the abuse of prescription opioids.

The "gateway" hypothesis describes the progression of substance abuse from licit drugs (alcohol and/or cigarettes) and illicit drugs (marijuana) during adolescence to "harder" drugs (heroin and cocaine) in young adulthood [1–5]. This hypothesis contains three interrelated conditions: sequencing, which implies that there is a static relationship between the two substances and that one is initiated before the other; association, which implies that there is a relationship between starting to use one substance and starting to use the second; and causation, which implies that use of one substance causes the use of the second. Although the final condition of causation is controversial, evidence of the sequencing and association aspects of this hypothesis is borne out by a number of studies, including one twin study demonstrating that individuals who used marijuana

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before age 17 years were two to five times more likely than their co-twin to engage in subsequent other drug use, abuse, or dependence [6]. However, a second study found that of the 50% of high school students who initiated licit drug use, only 15% progressed to marijuana and only 3% progressed to harder drugs [7].

These patterns of behavior are variable [8], and alternative hypotheses exist. For example, the "common factor model" supports the concept that if an individual has a propensity to use one drug, he/she has an increased propensity to use another drug [9]. In addition, there is evidence supporting a longitudinal pattern of drug use that is part of a genetically influenced developmental trajectory [10]. Despite ongoing debate between the gateway hypothesis and other theories such as the common factor model [9,11], there is growing evidence supporting the existence of the gateway hypothesis [8,12,13] and that it is present in both genders [14,15]. However, studies examining the issue of gender have found conflicting results. One demonstrated that early use of alcohol or cigarettes was associated with higher risk of drug use among male subjects but not female subjects [15]. In turn, another study found that neither gender nor race was associated with subsequent illicit drug use in those with previous licit drug use [7].

Another important issue is the availability of and access to specific drugs, as this may also have an impact on which earlier drugs used may be associated with subsequent drug use. The Monitoring the Future study reported in 2011 that between 38% and 59% of 8th graders, 68% and 78% of 10th graders, and 82% and 89% of 12th graders perceived marijuana, cigarettes, and alcohol as being fairly or very easy to get (perceived availability of cigarettes by 12th graders was not assessed given that cigarettes are thought to be universally available to 12th graders) [16]. A second survey revealed that teens described prescription medicine as being generally available, with an estimated 65% coming from their friends, family, or home [17]. Similarly, a recent study demonstrated that 77% of survey participants aged 18–25 years who reported abusing prescription opioids had acquired them only from nonmedical sources [18]. Although the gateway hypothesis has been explored for the relationship between marijuana and heroin or cocaine use, it has not been investigated for the subsequent abuse of prescription opioids or for potential differences based on gender with respect to prescription opioids.

Although in recent years overall adolescent drug use has been decreasing significantly in the United States, there has been an increase in prescription drug abuse in adolescents and young adults [16]. Strikingly, abuse of prescription opioids among teens is only exceeded by marijuana use, and there are comparable numbers of initiates of prescription opioids as there are of marijuana [19]. For the purposes of this study, we define the term "abuse" as the use of prescription opioids for the experience or feeling it causes or use of opioids prescribed for someone else. In 2010, an estimated five million people aged 12 years or older were current abusers of pain relievers. Two million were recent initiates, with the average age at first use of pain relievers among recent initiates aged 12–49 years being 21 years. In 2010, according to the National Survey on Drug Use and Health (NSDUH) and the Monitoring the Future study, among young adults aged 18–25 years and 19–24 years, respectively, the prevalence of past-year use ranged from 9% to 11% [16,19]. Thirteen percent of young adult men and 10% of young adult women reported past-year abuse of prescription opioids [20]. An astounding increase in prevalence of the abuse of prescription opioids has been seen in both adolescents and young adults. The prevalence of past-year abuse of prescription opioids in 12–17 year olds increased from 3.2% in 1994 to 6.2% in 2010 and in 18–25 year olds from 4.7% in 1994 to 11.1% in 2010 [19]. These percentages represent an estimated 1.55 million youths and 3.4 million young adults with past-year abuse of prescription opioids in 2010. In addition, an estimated 463,000 individuals aged 18–25 years met criteria for opioid dependence [20]. Finally, the number of persons receiving specialty substance use treatment within the past year for abuse of pain relievers more than doubled from 2002 to 2010, from 199,000 to 406,000. In 2010, more than 105,000 of these individuals were aged 18–25 years.

Given the increasing prevalence of abuse of prescription opioids in both young adult men and women, the purpose of the current study is to evaluate the association, not necessarily causality, between the previous use of alcohol, cigarettes, and marijuana and the subsequent abuse of prescription opioids in young adults, and to assess the role that gender may play in this relationship.

Methods

Data sources and respondents

We used data pooled from the 2006, 2007, and 2008 NSDUH conducted by the Substance Abuse and Mental Health Services Administration, Office of Applied Studies. The NSDUH is an annual self-report survey of civilian noninstitutionalized U.S. citizens aged 12 years and older that collects information on use of alcohol, cigarettes, and illicit drugs. Data were collected using a multistage area probability sample for each of the 50 states and the District of Columbia; respondents were paid $30 for a completed interview [21]. For the years 2006, 2007, and 2008, strategies for ensuring high participation rates resulted in weighted screening response rates ranging from 89% to 91% and weighted interview response rates for the computer-assisted interview portion in the range of 74%. Youths were oversampled to create equal sample sizes among the following age strata: 12–17 year olds, 18–25 year olds, and 26 years and older. Data for the current analysis include only those respondents aged 18–25 years. We divided the sample into four discrete age-groups: 18–19, 20–21, 22–23, and 24–25 years. We chose to separate near adolescents (18–19 years) from young adults (20–24 years) so as to investigate the unique characteristics associated with these ages and developmental stages. The final sample size for our analysis after combining the three surveys and restricting to 18–25 year olds was 55,215 respondents.

Survey validation and administration

The NSDUH used a combination of both a computer-assisted in-person interview and a computer-assisted audio self-interview, a survey administration platform that has been extensively validated for accuracy [21]. NSDUH questions are evaluated for accuracy and reproducibility of results, with a specific focus on nonambiguity of syntax [22]. The NSDUH has undergone multiple validations over the past 30 years, including a recent analysis of test–retest reliability of key measures [23]. Questions concerning past illicit drug use are tested for precision of answers, and nonresponse is studied for patterns and homogeneity of nonresponders [24].