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### **Addictive Behaviors**



## Patterns of use of other drugs among those with alcohol dependence: Associations with drinking behavior and psychopathology



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#### HIGHLIGHTS

- Specific patterns of concurrent non-alcohol substance use during the previous year were examined among a nationally representative sample of adults with DSM-IV alcohol dependence employing Waves 1 and 2 of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC).
- Latent class analyses classified respondents with alcohol dependence into four clinically meaningful patterns of concurrent substance use: (1) use of alcohol only; (2) use of alcohol and tobacco and cannabis; and (4) use of alcohol, tobacco, cannabis, cocaine, and other illicit drug(s).
- Among alcohol-dependent respondents, the most prevalent pattern was the use of alcohol and tobacco only, followed by the use of alcohol only.
- Alcohol-dependent respondents who used alcohol, tobacco, cannabis, cocaine, and other illicit drug(s) manifested the most severe pattern of alcohol consumption compared to those who used alcohol only.
- Alcohol-dependent respondents that used alcohol, tobacco, cannabis, cocaine, and other illicit drug(s) and had significant overrepresentations of major depression, panic, and other anxiety disorder, and paranoid, schizotypal, borderline, antisocial, and histrionic personality disorders compared with those who used alcohol only.

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#### ABSTRACT

*Introduction:* Alcohol dependence (AD) presents with substantial clinical heterogeneity, including concurrent use of non-alcohol drugs. Here, we examine specific patterns of concurrent non-alcohol substance use during the previous year among a nationally representative sample of adults with DSM-IV AD, and estimate their population prevalence in the U.S. We then evaluate alcohol use behavior and comorbid psychopathology among respondents with AD according to their patterns of concurrent non-alcohol substance use.

*Methods*: These analyses utilized data from Waves 1 and 2 of the National Epidemiologic Survey on Alcohol and Related Conditions. Latent class analyses classified respondents with AD into four clinically meaningful patterns of concurrent substance use: (1) use of alcohol only; (2) use of alcohol and tobacco only; (3) use of alcohol, tobacco, cannabis, cocaine, and other illicit drug(s).

*Results*: Among AD respondents, the most prevalent pattern was the use of alcohol and tobacco only (weighted percentage, 32.4%), followed by the use of alcohol only (weighted percentage, 27.5%). AD respondents who used alcohol, tobacco, cannabis, cocaine, and other illicit drug(s) (weighted percentage, 25.3%) manifested the most severe pattern of alcohol consumption, and had significant overrepresentations of major depression, panic, and other anxiety disorders as well as paranoid, schizotypal, borderline, antisocial, and histrionic personality disorders compared with those who used alcohol alone.

*Conclusions:* Specific patterns of concurrent substance use convey important information regarding the clinical presentation and prognosis for AD. In particular, concurrent use of illicit drugs over the past year by AD individuals was associated with greater severity and comorbid psychopathology. These data suggest the need for pragmatic trials of AD interventions that take into account patterns of substance use behavior in addition to an AD diagnosis. Published by Elsevier Ltd.

#### 1. Introduction

Alcohol dependence (AD) is a disorder of multifactorial etiology with a lifetime prevalence of approximately 12.5% in the U.S. adult population (Hasin, Stinson, Ogburn, & Grant, 2007). In both clinically and epidemiologically ascertained individuals, AD presents with substantial

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heterogeneity in clinical features, onset age, severity, treatmentseeking, comorbid psychopathology, and non-alcohol substance use (Babor et al., 1992; Bucholz et al., 1996; Cloninger et al., 1988; Jacob, Bucholz, Sartor, Howell, & Wood, 2005; Jellinek, 1960; Lesch, Dietzel, Musalek, Walter, & Zeiler, 1988; McGue, 1999; Moss, Chen, & Yi, 2007, 2008; Schuckit, 1985; Vaillant, 1983; Zucker, 1987). However, as noted by Brecht, Huang, Evans, and Hser (2008), it is typical in treatment settings to identify substance use problems by the primary substance for which help is sought (e.g., alcohol), without examining additional substance use behavior. While it may be practical to focus solely on the presenting substance use disorder, the use of additional specific or multiple substances may introduce considerable complications with respect to assessment, treatment strategy, and clinical outcome. Furthermore, while evidence-based guidelines exist for the management of single, or "pure," substance use disorders, little empirically supported guidance is available concerning the management of polysubstance-using patients. This may in part reflect a lack of data about these individuals.

In clinical settings, the use of multiple substances is associated with poorer treatment outcomes for disorders associated with illicit drugs such as heroin, cocaine, and methamphetamine (e.g., Bovasso & Cacciola, 2003; DeMaria, Sterling, & Weinstein, 2000; Downey, Helmus, & Schuster, 2000; Williamson, Darke, Ross, & Teesson, 2006). Similar but less extensive data are available examining the negative impact of concurrent non-alcohol substance use on interventions for AD (Malcolm, Hesselbrock, & Segal, 2006; Martin et al., 1996). Thus, variations in the responses of patients with AD to clinical interventions could reflect confounding by concurrent or recent substance use behavior rather than limitations in treatment efficacy.

In this report, we identify specific patterns of concurrent nonalcohol substance use during the previous year among adult respondents with DSM-IV diagnoses of AD in a nationally representative general population survey, and estimate the population prevalence of each pattern in the U.S. We then examine alcohol use behavior and comorbid psychopathology among respondents with AD classified by specific patterns of concurrent substance use. The results replicate and extend the aforementioned clinical observations (Malcolm et al., 2006; Martin et al., 1996), further delineating the heterogeneity of AD while illustrating the need for a more personalized treatment approach.

#### 2. Methods

#### 2.1. Sample

These analyses utilized data from Wave 1 (2001-2002) and Wave 2 (2004-2005) of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), conducted by the National Institute on Alcohol Abuse and Alcoholism, National Institutes of Health. As described elsewhere (Grant et al., 2004b), the entire NESARC protocol, including informed consent procedures, received full review and approval from the Institutional Review Board of the United States Census Bureau and the Office of Management and Budget. The Wave 1 NESARC sample represents the civilian, non-institutionalized population aged 18 years and older from the United States, including all 50 states and the District of Columbia, residing in households and selected non-institutional group quarters. Blacks, Hispanics, and young adults 18-24 years of age were oversampled and the overall response rate was 81% (n =43,093). Detailed information on the sample design and weighting is available elsewhere (Grant, Kaplan, Moore, & Kimball, 2007; Grant, Kaplan, Shepard, & Moore, 2003b, 2009; Grant et al., 2009). In Wave 2, face-to-face re-interviews were attempted with all Wave 1 respondents. Of the original Wave 1 sample, 3,134 were classified as ineligible because they were institutionalized, mentally or physically impaired, or on active duty in the armed forces throughout the Wave 2 interview period (n = 1,731); or were deceased, permanently moved (e.g., out of the country) or deported (n = 1,403). Of the 39,959 eligible respondents, 34,653 were re-interviewed at Wave 2, reflecting a response rate of 86.7%. The cumulative response rate in Wave 2, the product of the Wave 2 and Wave 1 response rates, was 70.2% and the mean interval between Wave 1 and Wave 2 interviews was 36.6 (SE = 2.6) months. The weighted mean age of Wave 2 subjects at Wave 1 were 45.1 years (SE = 0.2).

Grant et al. (2009) compared Wave 2 respondents with the target population (comprising Wave 2 respondents and eligible nonrespondents) on numerous baseline (Wave 1) sociodemographic and diagnostic measures. Results indicated no significant differences between the Wave 2 respondents and the target population on age, race-ethnicity, sex, socioeconomic status, or the presence of any lifetime substance use, mood, and anxiety or personality disorder (PD) diagnoses.

#### 2.2. Measures

The diagnostic interview used in the NESARC was the Alcohol Use Disorders and Associated Disabilities Interview Schedule - DSM-IV Version (AUDADIS-IV) for Wave 1 (Grant, Dawson, & Hasin, 2001) and Wave 2 (Grant et al., 2004a). The AUDADIS-IV is a fully structured instrument designed for administration by experienced non-clinician interviewers and includes modules to assess substance use, mood, anxiety, and personality disorders, as well as family histories of alcohol and drug use disorders, depression, and antisocial behavior. It also includes detailed questions concerning patterns of alcohol, tobacco, and other drug use. To obtain a Wave 1 past-year diagnosis of AD, respondents were required to meet at least 3 of the 7 DSM-IV symptom criteria during the 12 months prior to the baseline interview. Status of Wave 2 pastyear recovery from Wave 1 past-year AD was defined according to the 5-level classification described by Dawson et al. (2005): still positive for AD, in partial remission (not meeting past-year criteria for AD but endorsing at least one symptom of either alcohol abuse or alcohol dependence), asymptomatic risk drinking (no alcohol use disorder symptoms but consumption by men of more than 14 standard drinks per week or 5 or more drinks on any single day, or consumption by women of more than 7 standard drinks per week or 4 or more drinks on any single day), low-risk drinking (past-year alcohol consumption but no alcohol use disorder symptoms and no risk drinking as defined above) or abstinence (no past-year alcohol consumption). The weighted mean age of AD subjects at Wave 1 was 31.2 years (SE = 0.4).

Axis I disorders were assessed identically in the Wave 1 and Wave 2 versions of the AUDADIS-IV except for the time frames. Consistent with DSM-IV, Wave 1 past-year primary mood (major depressive and manic episodes) and anxiety (panic with or without agoraphobia, social and specific phobias, and generalized anxiety disorder) diagnoses excluded substance-induced cases and those due to general medical conditions. In addition, diagnoses of major depression ruled out bereavement. Personality disorders (PDs) were assessed on a lifetime basis. Those assessed at Wave 1 included avoidant, dependent, obsessivecompulsive, paranoid, schizoid, and histrionic PDs (Grant et al., 2004c). Antisocial PD was assessed at Wave 1 with a follow-up at Wave 2 to capture individuals who may not have met full diagnostic criteria at Wave 1 but went on subsequently to do so (Goldstein & Grant, 2009). Borderline, narcissistic, and schizotypal PDs were assessed at Wave 2 (Grant et al., 2008). DSM-IV PD diagnoses require evaluation of long-term patterns of functioning. Accordingly, respondents were asked symptom questions about how they felt or acted most of the time, throughout their lives, regardless of the situation or whom they were with, and instructed to exclude symptoms occurring only when they were depressed, manic, anxious, drinking heavily, using medicines or drugs, experiencing withdrawal symptoms, or physically ill. Respondents were also queried about whether they experienced distress or social or occupational impairment related to each reported symptom. To receive a DSM-IV PD diagnosis, respondents needed to endorse the required number of DSM-IV symptom criteria for the specific PD, with

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