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Specificity of social anxiety disorder as a risk factor for alcohol and cannabis dependence

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Abstract

Social anxiety disorder (SAD) is highly comorbid with alcohol use disorders (AUDs) and cannabis dependence. However, the temporal sequencing of these disorders has not been extensively studied to determine whether SAD serves as a specific risk factor for problematic substance use. The present study examined these relationships after controlling for theoretically-relevant variables (e.g., gender, other Axis I pathology) in a longitudinal cohort over approximately 14 years. The sample was drawn from participants in the Oregon Adolescent Depression Project. After excluding those with substance use disorders at baseline, SAD at study entry was associated with 6.5 greater odds of cannabis dependence (but not abuse) and 4.5 greater odds of alcohol dependence (but not abuse) at follow-up after controlling for relevant variables (e.g., gender, depression, conduct disorder). The relationship between SAD and alcohol and cannabis dependence remained even after controlling for other anxiety disorders. Other anxiety disorders and mood disorders were not associated with subsequent cannabis or alcohol use disorder after controlling for relevant variables. Among the internalizing disorders, SAD appears to serve as a unique risk factor for the subsequent onset of cannabis and alcohol dependence.
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1. Introduction

Social anxiety disorder (SAD) is frequently comorbid with both alcohol abuse and dependence (Davidson et al., 1993; Grant et al., 2005; Kessler et al., 1997) as well as cannabis dependence (Agosti et al., 2002; Lynskey et al., 2002). For instance, 48% of individuals with a lifetime diagnosis of SAD also meet criteria for a lifetime diagnosis of an AUD (Grant et al., 2005). The 12-month prevalence of AUDs among individuals with SAD is 13.1% (Grant et al., 2005) compared to only 8.5% among the general population (Grant et al., 2004). Similarly, findings from the National Comorbidity Study (NCS) indicate that there is a 4.2% lifetime prevalence rate for cannabis dependence in the general population, whereas among individuals with SAD, the prevalence rate of cannabis dependence is elevated to 29.0% (Agosti et al., 2002). Yet, little is known about the specificity or temporal sequencing of the relationships between SAD and these substance use disorders. Elucidation of these relationships could have important implications for the prevention and treatment of these conditions among socially anxious individuals (Heimberg and Becker, 2002).

The high rates of comorbidity between SAD and AUD and cannabis dependence are cause for concern because misuse of alcohol or cannabis tends to compound the already significant problems of patients with SAD. For example, SAD patients with AUD report more severe impairment than patients with SAD without AUD (Schneier et al., 1989) and alcoholics with SAD demonstrate more

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severe symptoms of alcohol dependence and display more depressive symptomatology than alcoholics without SAD (Thomas et al., 1999b). Cannabis dependence among individuals with SAD is problematic because smoking cannabis has a larger effect on respiratory function than smoking tobacco (Bloom et al., 1987; Sherrill et al., 1991), including cellular changes that may serve as a risk factor for cancer (Fligiel et al., 1997; Sarafian et al., 1999). Long-term cannabis use is associated with legal problems and increased alcohol and tobacco use (Patton et al., 2002; Reilly et al., 1998) and driving under the influence of cannabis leads to increased automobile crash risk (Ramaekers et al., 2004).

Among the anxiety disorders, SAD appears to show a particularly problematic risk profile for comorbid AUD and CUD. For example, SAD is associated with higher rates of AUD relative to most other anxiety disorders (Kessler et al., 1997). SAD is also correlated with cannabis dependence at rates more than twice that of any other anxiety disorder (Agosti et al., 2002). On the matter of sequencing, evaluation of typical age of onset of SAD and AUD suggests that SAD serves as a risk factor for subsequent AUD (Kessler et al., 1997; Randall et al., 2001a; Randall et al., 2001b; Schneier et al., 1989). Additionally, in a 13-year longitudinal investigation (Crum and Pratt, 2001), individuals with subclinical symptoms of SAD showed a greater risk for AUD relative to individuals without subclinical SAD symptomatology. Unexpectedly, individuals diagnosed with SAD using DSM-III standards did not show an increased risk of subsequent AUD, but changes in diagnostic criteria for SAD from DSM-III to DSM-IV-TR complicate interpretation of these findings in relation to contemporary diagnostic definitions. In particular, DSM-III criteria included avoidance as a necessary symptom for social phobia and avoidance is no longer a necessary criterion for SAD. This change is not trivial because it may very well be those individuals with SAD who do *not* avoid social situations who are most vulnerable to problematic alcohol use, especially if they use alcohol in social situations in an attempt to attenuate anxiety reactions. Similarly, among German adolescents, SAD is associated with subsequent regular and hazardous alcohol use but not DSM-IV alcohol abuse or dependence at 4-year follow-up (Zimmermann et al., 2003). That study, however, did not follow participants very far into the typical period of onset of alcohol dependence, thereby limiting its interpretability. Although there are no known longitudinal investigations of the relationship between SAD and cannabis abuse and/or dependence, given that marijuana users report they use to marijuana to cope with stress and anxiety (Hathaway, 2003; Ogborne et al., 2000), it follows that a similar temporal relationship would occur between SAD and cannabis dependence.

The limited literature in this area makes it difficult to draw firm conclusions regarding the risk for alcohol and cannabis use disorders among those with SAD. Importantly, it is unknown whether the development of AUD or CUD is unique to SAD versus other forms of anxiety. The question of specificity is critical because SAD is highly comorbid with other anxiety disorders (Davidson et al., 1993; Merikangas and Angst, 1995) and other anxiety conditions are associated with increased rates of AUD (Kushner et al., 1990) and cannabis dependence (Zvolensky et al., 2006). When all anxiety disorder diagnoses were combined, anxiety disorders preceded AUD in the Oregon Adolescent Project (Rohde et al., 1996). However this study did not investigate the temporal relations among specific anxiety disorders. The few studies that have examined specific anxiety conditions and their temporal associations with AUD and CUD suggest that other anxiety disorders were more likely to be sequelae of alcohol and cannabis use, whereas SAD may serve as a risk factor for subsequent AUD and CUD. For instance, among individuals with co-occurring panic and AUD, panic onset tends to follow AUD (Kushner et al., 1990). Age of onset of panic is also later than that of CUD among individuals with both conditions (Zvolensky et al., 2006). Similarly, age of onset of substance use disorder is earlier than that of generalized anxiety disorder (GAD) among individuals with both disorders (Kessler et al., 2002).

It is also unclear whether SAD and/or other anxiety conditions demonstrate specific relationships to AUD or cannabis dependence after accounting for other types of psychopathology related to these substance use disorders. Considering that SAD is highly comorbid with mood disorders (Stein and Kean, 2000) and that depression is related to both alcohol and cannabis use problems (Buckner et al., in press), often preceding the onset of alcohol use (King et al., 2004) and cannabis use (Paton et al., 1977), it may be that the high rates of alcohol and cannabis dependence among individuals with SAD are due to co-occurring mood pathology. Likewise, externalizing disorders, particularly conduct disorder, are highly comorbid with anxiety disorders (Russo and Beidel, 1994; Zoccolillo, 1992) and predict later AUDs and CUDs (Myers et al., 1995), so they must be controlled in analyses of connections between anxiety and substance use disorders. And, of course, alcohol and cannabis use are themselves highly comorbid (Agosti et al., 2002), making it is necessary to examine the effects of one substance after controlling for effects of the other.

Further, the majority of studies in this area tend to combine alcohol abuse and alcohol dependence diagnoses (Crum and Pratt, 2001; Schneier et al., 1989), making it difficult to demarcate whether individuals with SAD are at increased risk for alcohol abuse, dependence or both. This distinction is important because alcohol dependence is a more debilitating disorder (American Psychiatric Association, 1980) and it appears that individuals with SAD are particularly vulnerable to this more severe condition. For example, epidemiological studies using DSM-IV criteria suggest SAD is more likely to be associated with increased risk of alcohol dependence than alcohol abuse (Grant et al., 2005; Kessler et al., 1997). Further, among