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Insomnia in Alcohol Dependence: Predictors of Symptoms in a Sample of Veterans Referred from Primary Care

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Abstract

Objective—Patients with alcohol dependence presenting for treatment may have multiple associated co-morbid conditions and limited social supports, which complicate treatment. Each of these factors has been independently associated with complaints of insomnia. In this preliminary study, we investigated the relations between insomnia complaints and socio-demographic factors and psychiatric comorbidity in treatment-seeking patients with alcohol dependence.

Method—We conducted a retrospective chart review on 84 consecutive patients referred to the Behavioral Health Laboratory of the Philadelphia Veterans Affairs Medical Center for evaluation of psychiatric and substance use disorders. Patients met DSM-IV diagnostic criteria for alcohol dependence and completed a series of self-assessments of sleep. Univariate and multivariable analyses were used to examine the relations amongst the variables of interest.

Results—In multivariable models, Sleep Latency was significantly greater in individuals without partners ($p = .01$), those with psychiatric disorders ($p = .03$) and smokers ($p = .01$), with a non-significant trend for those with past-year suicidal ideation. No significant predictor of Wake Time After Sleep Onset was seen. Poor Sleep Quality was predicted by younger age (OR = .93 [.88, .98], $p = .004$) and the presence of a psychiatric disorder (OR = 20.80 [4, 102], $p = .0002$), with a non-significant trend for suicidal ideation.

Conclusions—Insomnia symptoms in treatment-seeking alcohol dependent patients should prompt consideration of the individuals' psychiatric and psychosocial features.

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Declaration of Interest

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INTRODUCTION

Alcohol dependence is commonly associated with insomnia.^{1,2} Individuals with chronic alcohol dependence are 2.6 times as likely to have insomnia as those without such a history.³ However, the complex relationship between alcohol dependence and insomnia is not well understood, particularly because alcohol dependent patients often have high levels of co-morbid psychiatric and substance use disorders, which confound interpretation.⁴⁻⁶ Many psychiatric disorders such as depression, and symptoms such as suicidal ideation, are also independently associated with insomnia.⁷⁻⁹ Because alcohol dependence often co-occurs with other psychiatric disorders,⁴ it is unclear whether individuals who present with comorbid alcohol dependence and other psychiatric conditions are more likely to experience sleep disturbances than those with alcohol dependence alone. Moreover, there is an association between sleep parameters and various socio-demographic factors (eg, age,¹⁰ race/ethnicity,¹¹ and marital status¹²) in relatively healthy participants, which may also confound this relationship.

Because many psychiatric and socio-demographic factors increase risk for both insomnia and alcohol dependence, little is known about whether these factors are associated with insomnia in the context of alcohol dependence. Accordingly, in the present study, we examined socio-demographic and psychiatric factors related to subjective reports of insomnia in a heterogeneous population of veterans meeting diagnostic criteria for alcohol dependence. We hypothesized that socio-demographic factors (older age, the absence of a partner), substance use factors (greater severity of alcohol dependence, other drug use, smoking status), and psychiatric factors (psychiatric disorders, suicidal ideation) are related to insomnia symptoms in the context of alcohol dependence.

METHODS

Referral Procedure

Primary care providers within the Philadelphia Veterans Affairs Medical Center (PVAMC) referred patients who screened positive for at-risk drinking (ie, score >4 on the AUDIT-C)¹³ or any other substance use disorder, or who were suspected of having a psychiatric disorder to the Behavioral Health Laboratory (BHL). The BHL is a primary-care/mental-health service at the PVAMC that evaluates patients using a battery of assessments.¹⁴ The battery assesses the following domains: baseline demographic data, Blessed-Orientation-Memory-Concentration scale (BOMC),¹⁵ Mini-International Neuropsychiatric Interview (MINI) modules for mood disorders, anxiety disorders, and alcohol abuse/dependence;¹⁶ Patient Health Questionnaire 9-item scale (PHQ-9),¹⁷ PTSD check list (PCL),¹⁸ history of past episodes of depression, current antidepressant medications, alcohol consumption, smoking, use of illicit substances, five-item Paykel scale for suicidal ideation,¹⁹ short form-12 item scale (SF-12),²⁰ work limitation questionnaire,²¹ treatment satisfaction, insomnia, social support, bodily pain, and diet. If, after further evaluation, the patient is deemed at risk to attempt suicide, appropriate procedures for urgent or emergent psychiatric care are activated.

Participants

In this retrospective chart review, we extracted data from the charts of 84 patients who met DSM-IV criteria for alcohol dependence and completed sleep-related assessments. Thus, the responses to the assessments were reviewed retrospectively. The study was reviewed and approved by the Institutional Review Board at the Philadelphia VAMC.

Measures

The charts of the veterans were reviewed for assessments conducted between March 6, 2008 and July 7, 2008. During this time interval additional sleep assessments were embedded in the battery to evaluate the sleep parameters of veterans referred to the BHL in a pilot study.

Socio-Demographic Characteristics assessed included age, race (White, African American, and other/mixed), ethnicity (Hispanic descent or not), and relationship status (single, married/partnered).

Drinking Behavior was assessed as standard drinks of alcoholic beverages consumed over the last 7 days using the time line follow-back method,²² as well as the frequency of binge drinking days over the last 3 months (5 standard drinks for men and 4 for women on a single day) prior to the interview.

Other Drug Use was assessed by inquiring specifically about the frequency of use of cocaine, heroin, marijuana, speed inhalants, LSD, barbiturates, and club drugs. We coded drug use as lifetime (“yes”/“no”), and past year (the number of times the individual drugs were used, with response categories being “never,” “less than 10,” “more than 10,” and “refused”).

Sleep Continuity was assessed during the interview using several items: “How long does it usually take you to fall asleep at night?” assessed sleep latency (SL) and “How long are you usually awake during the middle of the night, after initially falling asleep?” was used as a measure of wake after sleep onset (WASO). Both items were worded to reflect standard sleep diary items.¹⁶ Patients were also queried regarding the duration (in months) of insomnia: “How long have you had difficulty sleeping?” *Sleep quality* (SQ) was assessed with a single item comprising the sleep quality subscale from the Pittsburgh Sleep Quality Index (PSQI).¹⁷ This question asked: “During the past month, how would you rate your overall sleep quality?” Responses were on a 4-point Likert scale ranging from “very good,” “fairly good,” “fairly bad,” and “very bad,” with scores ranging from 1 to 4, respectively. This item correlates highly ($r = .83, p < .001$) with the global PSQI score.^{23,24} For the purposes of this study, overall SQ was dichotomized as “good” or “poor.”

Psychiatric Status was assessed using several modules from the MINI,¹⁶ including those pertaining to alcohol dependence over the past 12 months; lifetime mania, psychosis, post-traumatic stress disorder (PTSD), and panic disorder; generalized anxiety disorder over the past 6 months. Depressive disorder was diagnosed using the PHQ-9¹⁷ using a cutoff score of 10.²⁵ *Suicidal ideation* over the last year was assessed using the total score from the 5-item Paykel questionnaire.¹⁹

Statistical Analysis

Demographic and clinical differences between individuals with alcohol dependence only (AD) and those with alcohol dependence and other drug use in the past year (AD þ D) were assessed using the independent samples *t*-test or the Mann–Whitney *U*-test, as appropriate. *Dependent variables* included SL, WASO, and SQ. SL and WASO were arrayed continuously, in terms of minutes. SQ was initially arrayed as an ordinal variable and was dichotomized for analyses. *Independent variables* were the total alcohol dependence score (which ranged from 3 to 7, reflecting the number of DSM-IV criteria met over the past 12 months; the lowest score was 3 in these alcohol dependent patients) from the MINI, age, presence of a partner, psychiatric status (assessed with the MINI, and dichotomized as any disorder present vs. absent), drugs in the past year (any use vs. no use), smoking (current smoking vs. not currently smoking), and Paykel score.²⁶

Linear regression was used to evaluate predictors of SL and WASO. The relationship of SQ and potential predictors was assessed using binary logistic regression. The potential predictors used in all regression analyses were age, relationship status, alcohol dependence score (range 0–7 DSM-IV criteria) in the past year, psychiatric status (dichotomized), any drug use in the past year (dichotomized), smoking status (dichotomized), and Paykel score.²⁶ Multivariable models included predictors with a $p < .20$ in univariate analyses.

RESULTS

Participants

The mean age of the sample was 51 years ($SD = 13$), which was comprised almost entirely of men (97.6%). The sample was 61.9% African American and 28.6% married/partnered. The mean number of current alcohol dependence criteria met was 4 ($SD = 1$), with 45 ($SD = 30$) binge drinking days in the past 3 months and 31 ($SD = 28$) standard drinks consumed in the past week. In the past year, 42% of individuals used cannabis, 36% used cocaine, and 3.5% used other drugs. Sixty-four percent of the veterans had a depressive disorder, 24% mania, 29% PTSD, 37% generalized anxiety disorder, and 6% panic disorder. Fifty-eight percent of the veterans were current smokers. Twenty-five percent of individuals used psychotropic medications in the past month, with 9.5% having used hypnotics.

Sleep

Poor SQ was reported by 63% of the sample, with a mean score of 2 ($SD = .9$). Mean SL was 72 minutes ($SD = 67$) and mean WASO was 82 minutes ($SD = 76$). Mean duration of insomnia was 75 ($SD = 123$) months. Participants who were married/partnered reported a shorter SL than those who were not partnered: 47 minutes ($SD = 47$) and 83 minutes ($SD = 71$), respectively, $p = .02$. Participants with no co-morbidities had better sleep quality [1.78 ($SD = .44$)] than those with comorbid disorders [2.97 ($SD = .85$)], $p < .001$. Alcohol dependent patients with a history of other drug use in the past year (as compared to those without such a history) reported having a longer SL [91 minutes ($SD = 70$) vs. 56 minutes ($SD = 61$), respectively, $p = .02$] and poorer sleep quality [3.10 ($SD = .74$) vs. 2.61 ($SD = .97$), respectively, $p = .01$].

Univariate Analysis

As shown in Table 1, the following variables were significant predictors of increased SL: relationship status (non-partnered), presence of a psychiatric disorder, use of other drugs, current smoking, and suicidal ideation. WASO was predicted by alcohol dependence severity, presence of a psychiatric disorder, and past-year suicidal ideation. Poor SQ was predicted by younger age, presence of a psychiatric disorder, use of other drugs, and suicidal ideation.

Multivariable Analysis

Greater SL was predicted by absence of a partner, presence of a psychiatric disorder, and smoking (see Table 1). There was also a non-significant trend for increased SL among individuals who reported past-year suicidal ideation. Although there were no significant predictors of WASO, there was a non-significant trend for increased WASO among individuals with a psychiatric disorder. SQ was predicted by younger age and the presence of a psychiatric disorder, with a non-significant trend for past-year suicidal ideation.

DISCUSSION

In this preliminary study of treatment-seeking alcohol dependent patients, we evaluated predictors of insomnia symptoms. The patients reported insomnia symptoms consisting of difficulty falling asleep, difficulty staying asleep, and an unsatisfactory quality of sleep. Insomnia in these patients typically had a chronic course. Alcohol dependent patients with drug use in the past year had more complaints of increased sleep latency and inadequate sleep quality. Greater sleep latency was associated with not having a partner, having a comorbid psychiatric disorder, and being a current smoker. Subjective poor sleep quality was predicted by younger age and the presence of a psychiatric disorder.

Relationship/marital/partner status is increasingly recognized as an important and complex factor independently associated with sleep parameters¹² and alcohol use.²⁷ The finding of more insomnia complaints in our non-partnered patients is notable, as it may mean that poor sleep, or behaviors interfering with sleep like smoking and drinking, makes it more likely for an individual not to have a partner. The other unique finding was the presence of better SQ in older alcohol dependent patients. This is in line with two recent studies showing better SQ in older participants.^{28,29}

As expected, alcohol dependent patients who were smokers and who had co-morbid drug use disorders had greater difficulty falling asleep. It is interesting to note that current suicidal ideation approached significance as an independent predictor of a disturbance of sleep continuity. Prior research has shown that suicidal ideation is independently related to alcohol dependence^{30,31} and insomnia.^{8,9}

Limitations of this study include the retrospective, non-randomized, uncontrolled nature of the study; the subjective insomnia assessment; the BHL assessment did not differentiate between primary or substance-induced psychiatric disorders; the lack of more detailed data on substance use and disorders; and the relatively small sample size. Although we did not use polysomnography to assess sleep disturbances, insomnia is commonly assessed using

subjective measures.²³ Despite these limitations, this study is among the first to assess predictors of insomnia in a sample of treatment-seeking alcohol dependent veterans with common co-morbidities.

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TABLE 1

Univariate and multivariable models of predictors of insomnia symptoms

Variable	Univariate analysis			Multivariable analysis		
	β [95% CI]	<i>t</i>	<i>p</i> -Value	β [95% CI]	<i>t</i>	<i>p</i> -Value
Model 1: sleep latency (SL) $R^2 = .23$, $F(5, 72) = 5.69$, $p < .001$						
Age	-.12 [-1.84, .53]	-1.10	.28			
Race	-.05 [-.39, .24]	-.47	.64			
Partner status	-.25 [-.70, -.4]	-2.27	.02	.26 [69, 9]	-2.58	.01
Alc. dep. severity	.14 [-.4, .19]	1.23	.22			
Psychiatric disorder	.32 [16, 81]	2.99	.004	.24 [2, 70]	2.13	.03
Drug use in past year	.26 [6, 64]	2.37	.02	.02 [-27, 33]	.20	.83
Smoking status	.29 [10, 70]	2.67	.009	.27 [6, 63]	2.39	.01
Suicidal ideation	.30 [3, 21]	2.78	.007	.20 [-1, 17]	1.62	.10
Model 2: wake time after sleep onset (WASO) $R^2 = .10$, $F(4, 73) = 3.34$, $p = .01$						
Age	.03 [-1.13, 1.58]	.33	.74			
Race	-.09 [-.50, .20]	-.86	.39			
Partner status	-.005 [-.39, .37]	-.04	.96			
Alcohol dependence	.23 [.90, 27]	2.12	.03	.10 [-9, 20]	.80	.42
Psychiatric disorder	.33 [20, 93]	3.08	.003	.21 [-4, 79]	1.78	.08
Drug use in past year	.20 [-4, 63]	1.73	.09	.04 [-29, 42]	.37	.71
Smoking status	.03 [-.30, .40]	.28	.78			
Suicidal ideation	.30 [4, 24]	2.83	.006	.16 [-4, 19]	1.30	.20
	OR [95% CI]	χ^2	<i>p</i> -Value	OR [95% CI]	χ^2	<i>p</i> -Value
Model 3: sleep quality (SQ) AIC = 68.72; c-c = .91						
Age	.94 [.90, .98]	7.64	.005	.93 [.88, .98]	8.04	.004
Race	1.08 [.42, 2.78]	.02	.87			
Alcohol dependence	1.19 [.84, 1.71]	.99	.31			
Psychiatric disorder	29.94 [8, 108]	27.06	<.001	20.80 [4, 102]	13.97	.0002
Drug use in past year	1.69 [1.05, 2.70]	4.71	.03			
Smoking status	1.26 [.51, 3.08]	.24	.61			
Suicidal ideation	2.18 [1.39, 3.42]	11.48	.0007	1.66 [.96, 2.89]	3.27	.07

Univariate and multivariate – for the variables of Sleep Latency (SL) and Wake Time After Sleep Onset (WASO), we evaluated for the individual relationship of the variables like age, race, partner status, etc. individually (ie, in separate Univariate analysis). All the variables that showed a significant relationship with SL or WASO were then entered into final analyses to evaluate which variables still remained in the final model (Multivariable analysis). In order to display the results efficiently, and as done in prior studies, we used the Univariate analysis on the left side and the Multivariable analysis on the right side.

β = standardized beta value; CI = confidence interval; Alc. dep. severity = alcohol dependence severity; partner status = partnered/not with a partner; AIC = Akaike Information Criteria; c-c = additional parameter on the fitness of the logistic regression model.