

Depression and Anxiety in Alcohol Dependent Inpatients Who Smoke

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Abstract: *Background:* Research supports the observation that “smokers drink and drinkers smoke.” In this study, we aim to evaluate the relationship between nicotine dependence and the severity of anxiety and depression among alcohol dependent inpatients. *Method:* The study comprised 125 inpatients diagnosed as having alcohol dependence. They were given the SCID-I, AUDIT, Fagerstrom Test for Nicotine Dependence, Hamilton Rating Scale for Depression, and Hamilton Anxiety Rating Scale. *Results:* Our findings showed that the mean scores of the severity of anxiety and depression were high in alcohol dependent inpatients with nicotine dependence, but there was no significant difference between the nicotine dependent and nondependent groups in the severity of anxiety and depression. *Conclusion:* Comparative studies between alcohol dependent patients who smoke and different smoking or nonsmoking groups with anxiety or depression may provide valuable information. Further studies are needed to examine the correlations between these groups.

Introduction

Extensive research supports the popular observation that “smokers drink and drinkers smoke.” Moreover, the heaviest alcohol consumers are also the heaviest consumers of tobacco (1–3). Batel and Rueff showed, in a population of alcohol dependent patients, that the prevalence of tobacco addiction reached 81% (4). The authors suggested that the severity of alcohol dependence mirrored that of the patients’ nicotine dependence; the heavily alcohol dependent patients were also heavily nicotine dependent (1–4).

Most adult users of alcohol or tobacco first tried these drugs during their early teens (5). According to a study by Gulliver et al., the daily number of cigarettes, and tobacco dependence, are positively correlated with alcohol dependence (6).

There are certain psychobiological mechanisms of co-morbidity between alcohol dependence, tobacco smoking, depression and anxiety. Neurotransmitters appear to work together in a cascade of excitation or inhibition, between complex stimuli and complex responses, leading to a rewarding feeling of well-being in the normal person. In the cascade theory of reward, a disruption of these intercellular interactions results either in anxiety,

anger and other “bad feelings” or in a craving for a substance that helps relieve these negative emotions. Alcohol is known to activate the norepinephrine system in the limbic circuitry through an intercellular cascade that includes serotonin, opioid peptides and dopamine. Alcohol may also cause a direct effect through the production of neuroamines that interact with opioid receptors or with dopaminergic systems (7, 8). Nicotine is the primary ingredient of tobacco that triggers reinforcement. Ultimately, nicotine brings about the release of dopamine in the nucleus accumbens (5). Alcohol consumption also leads to dopamine release, although the mechanism by which alcohol produces this effect is not completely understood. Nicotine and alcohol may serve to set off the same opiopeptide responses at times of emotional disturbance (9, 10).

Smokers with comorbid depressive disorders (DD) are more prone to become dependent on nicotine, to progress to a more severe level of dependence, and to experience more severe nicotine withdrawal symptoms than smokers without DD (11, 12). A history of depression has a negative effect on the outcome of smoking cessation treatments (13). Smoking may diminish the chances of recurring depression in some people, and depression may

follow smoking cessation in these subjects (13, 14). Smoking may relieve the negative effects in a person whose need for alcohol is associated with depression and anxiety (4, 6). Alcohol users could add the tobacco answer to that of alcohol to face up to a difficult situation (15, 16). Surveys of both clinical and non-clinical populations indicate that at least 90% of people with alcohol dependence are also nicotine dependent (17, 18).

Objectives

In this study, we aim to evaluate the relationship between nicotine dependence and the severity of anxiety and depression among a group of Turkish alcohol dependent inpatients. Some studies have reported that alcohol dependent patients who smoke have lower depression and anxiety levels, and that their levels of anxiety and depression increase following nicotine withdrawal (7, 13, 14). We hypothesized that the severity of depression and anxiety would be significantly lower in the nicotine dependent group.

Method

Participants

For the study, 125 male alcohol dependent smokers who were inpatients at the Alcohol and Drug Treatment Education and Research Center (AMATEM-Istanbul, Turkey) in the Bakirkoy Research and Training Hospital for Psychiatric and Neurological Diseases over two months were consecutively selected. AMATEM is the only specialized center for substance use disorders in Istanbul and is the largest treatment center for dependence in Turkey, with 120 inpatient beds. It accepts patients from all over the country.

All patients had to fulfill DSM-IV criteria for alcohol dependence. Interviews with the patients in the sample were conducted after detoxification, four weeks after their last use of alcohol. The Turkish version of the Alcohol Use Disorders Identification Test (AUDIT) was administered, and if the patient rated a score of 8 or above alcohol dependence was diagnosed according to the substance-use disorders module of the Structured Clinical Interview for

Axis-I (SCID-I) of the Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV), Turkish version. All patients gave written informed consent after receiving a full explanation of the study. The Ethical Committee of the institution approved the study. Those aged less than 18 years, with mental retardation or cognitive impairment, or with co-morbid psychotic disorder, were excluded from the study.

Measures

Other than the sociodemographic data form designed for this study, the following measures were used:

Structured Clinical Interview for DSM-IV, Axis-I (SCID-I): Axis I diagnoses were based on a clinical screening interview conducted by a trained interviewer in accordance with the SCID-I (19), Turkish version (20). Alcohol dependence was diagnosed according to the substance-use disorders module of SCID-I.

Alcohol Use Disorders Identification Test (AUDIT): This test makes it possible to determine alcohol users, and identify the risks associated with the use of alcohol, harmful use, and cases of alcohol addiction. The total score of the scale is 40, and, although there are different cutoff points (varying between 8 and 11) for different populations, the cutoff point of 8 has been proposed for studies conducted in many countries (21, 22). Validity and confidence studies of the Turkish version have been conducted by Saatcioglu et al. (23).

The Fagerstrom Test for Nicotine Dependence (FTND): It contains items that evaluate the quantity of cigarette consumption, the compulsion to use, and dependence. Heatherton et al. (24) examined and refined the Fagerstrom Tolerance Questionnaire. They found that the nicotine rating item and the inhalation item were unrelated to any of our biochemical measures and these two items were primary contributors to psychometric deficiencies in the FTQ. Total scores should range from 0 to 11, with 7 or greater suggesting physical dependence on nicotine.

To measure depression and anxiety, severity was evaluated on the basis of symptoms (not the disor-

der) using the 17-item clinician-administered rating scale, *Hamilton Rating Scale for Depression (Ham-D)* (25, 26) and the 14-item clinician-administered rating scale *Hamilton Anxiety Rating Scale (HARS)* (27, 28), respectively.

Analysis

The statistical package SPSS 10.0 for Windows was used for the analyses. We compared anxiety and depression scores in alcohol dependents with and without nicotine dependence. Categorical variables were compared using the chi-square statistical method. Odds ratios and 95% confidence intervals were calculated. Differences between means for univariate analyses on continuously distributed variables were contrasted using a *t*-test. For all statistical analyses, *p* values were two-tailed, and differences were considered significant at $p < 0.05$.

Results

The study sample was made up of 125 patients (mean age = 42.59 ± 7.39 years, range = 26–61). Of the 125 patients, 97 (77.6%) were nicotine dependent, 57 of them (45.6%) had graduated from primary school, and 85 (68%) were self-employed and 77 (61.6%) were married. There was no statistically significant difference in the sociodemographic variables between the two groups, except the education level. In this group of alcohol dependent patients, individuals with nicotine dependence had significantly higher levels of education ($\chi^2 = 11.15$, $df = 3$, $p = 0.01$). For the entire sample, the mean age at which alcohol use started was 18.98 ± 4.72 years (range = 12–30), the mean duration of intensive alcohol use was 3.38 ± 4.48 years (range = 0.5–25), the mean age of starting to smoke was 17.18 ± 4.19 years (range = 8–30), and the mean duration of smoking was 25.44 ± 8.12 (range = 13–44).

No correlation was found between the severity of nicotine dependence and the severity of anxiety (total: $r = 0.16$, $p = 0.07$; psychic: $r = 0.165$, $p = 0.06$; somatic: $r = 0.147$, $p = 0.11$), or the severity of alcohol harmful use ($r = 0.10$, $p = 0.26$). A positive correlation was detected between the severity of nicotine dependence and severity of depression ($r = 0.236$, $p = 0.001$) (Table 1).

Table 1. Correlation between the severity of nicotine dependence among alcohol dependents and scores of AUDIT, HARS and Ham-D

	Pearson's <i>r</i> value	Std error	<i>p</i>
AUDIT	0.101	0.072	0.26
HARS Total	0.160	0.084	0.07
HARS Psychic	0.165	0.083	0.06
HARS Somatic	0.147	0.085	0.11
Ham-D	0.236	0.082	0.00*

* statistically significant correlation

Among alcohol dependent inpatients who were also nicotine dependent, the mean score of the severity of total anxiety was 8.75 ± 8.98 , psychic anxiety was 4.59 ± 3.87 , and somatic anxiety was 4.35 ± 5.57 . These mean scores were higher than the total (6.36 ± 6.49), the psychic (3.36 ± 2.68) and the somatic (3.00 ± 4.42) anxiety severities of the group without nicotine dependence. The mean score of the severity of depression in the nicotine dependent group (4.48 ± 4.11) was higher than in the non-dependent group (3.14 ± 4.62), compared to the group for which no correlation was found. In particular, anxiety was high among both those with and without nicotine dependence. The mean score of depression severity was higher in the nicotine dependent group, yet the difference did not reach significance level ($t(123) = 1.38$, $p = 0.17$). No significant difference was found between the groups with and without nicotine dependence with respect to anxiety (total: $t(123) = 1.31$, $p = 0.19$; psychic: $t(123) = 1.57$, $p = 0.12$; somatic: $t(123) = 1.16$, $p = 0.24$) (Table 2).

Discussion

The high rate of nicotine dependency (77.6%) in this group of alcohol dependent patients is consistent with previous studies, in which the joint occurrence of tobacco addiction and alcohol addiction was observed and the prevalence of smoking was found to be between 71% and 97% (1, 4, 6, 29, 30). Several authors have suggested that the two needs may result from a social cognitive apprenticeship, which explains how the first product may incite the second, each one serving as the stimulus for the other (1, 2, 4, 8, 30).

Table 2. Comparison of depression and anxiety scores in alcohol dependents with nicotine dependence ($n=97$) and without nicotine dependence ($n=28$).

	Nicotine	Mean \pm SD	t	df	p	95% Confidence interval of the difference	
Ham-D	Nondependence	3.14 \pm 4.62	1.38	123	0.17	.58	3.27
	Dependence	4.48 \pm 4.11					
HARS Total	Nondependence	6.36 \pm 6.49	1.31	123	0.19	1.21	6.00
	Dependence	8.75 \pm 8.98					
HARS Psychic	Nondependence	3.36 \pm 2.68	1.57	123	0.12	.32	2.78
	Dependence	4.59 \pm 3.87					
HARS Somatic	Nondependence	3.00 \pm 4.42	1.16	123	0.24	.92	3.62
	Dependence	4.35 \pm 5.57					

In this group of alcohol dependence, we measured the severity of anxiety and depression accompanying alcohol dependence. Alcohol abuse studies also suffer from the methodological difficulties of diagnostic approaches to addiction or abuse. To eliminate this problem, the SCID-I and AUDIT were used. Scores of 8 or more were found by AUDIT in the first step, and then alcohol dependence was diagnosed by applying the substance use disorders module of the SCID-I.

In our study, anxiety and depression of alcohol dependents with nicotine dependence was higher than in those without nicotine dependence, though this difference was not significant. The hospital setting, and the fact that the selection of patients was made after their symptoms of withdrawal had disappeared, may have an impact on the severity of anxiety and depression scores. We found that the levels of anxiety and depression were below the cutoff scores. It should be noted that the comfortable and reliable hospital environment could decrease the severity of anxiety and depression. The severity of anxiety was found to be higher in the nicotine dependent group in our study. Patient statements that smoking relaxes them may suggest that nicotine decreases the severity of anxiety. These results might imply psychobiological mechanisms of comorbidity between alcohol dependence, tobacco smoking, depression and anxiety.

Symptoms of depression are likely to develop

during the course of alcoholism. When depressive symptoms are secondary to alcoholism, they are likely to disappear within a few days or weeks of abstinence, as withdrawal symptoms subside (31, 32). This is why the patients were enrolled in the study four weeks after withdrawal symptoms disappeared. Various studies have found that depression increases or decreases smoking (13, 33, 34), and the incidence and predictors of major depression following successful smoking cessation treatment have been examined (35). However, according to our results, despite the fact that depression in alcohol dependents with nicotine dependence was higher than in those without nicotine dependence, the difference was not significant. It should be noted that there is a correlation between the severity of nicotine dependence and the severity of depression among alcohol dependents. To the best of our knowledge, no study has examined the relationship between depression or anxiety levels of nicotine dependents and nondependents in patients with alcohol dependence.

Among alcohol users entering treatment, about two-thirds have symptoms that resemble anxiety disorders (36). The relation between major anxiety disorders and alcoholism is still unclear (37, 38). It is known that frequency and severity of anxiety and depression symptoms will increase in the deprivation period due to withdrawal symptoms. Therefore, it is recommended that the evaluation of anxiety and depression should be considered after the comple-

tion of the withdrawal period. In this study, severity of anxiety and depression was found to be high in alcohol dependent men with nicotine dependence. Conclusions drawn from the present study are limited by the design of a one-time measure. This study has clearly shown the association between nicotine dependency and depression and anxiety levels among this group of alcohol dependence.

Our study was subject to certain limitations. First, all patients were hospitalized males, and those not dependent on nicotine were only a minority. Second, this was a single-point study, which lacks the follow-up of patients over time. Third, the study was carried out with a relatively small sample. Further studies should be conducted with larger and more heterogenous samples of in- and outpatient alcohol and nicotine dependents, or on those with no treatment application at all.

In conclusion, our findings did not support our hypothesis that, among alcohol dependent inpatients, those with nicotine dependency would be less depressed as well as less anxious. This finding also contradicts the results of most previous studies (7, 13, 16). However, since the depression and anxiety scores of our sample were below the recommended cutoff points, it might be considered that smoking, whether at a level considered nicotine dependence or not, might have an effect upon depression and anxiety. Answers to the following questions may help in further examining the link between smoking, depression and anxiety in alcohol-use disorder patients. What are the possible factors that affect smoking in alcohol users? What kind of a role do anxiety or depression play in this relationship? Comparative studies between alcohol users who smoke and different smoking or nonsmoking groups with anxiety or depression may provide valuable information. Therefore, further studies are needed to address the correlation between these groups.

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