

RESEARCH

## Relationship between alcohol and tobacco dependencies among alcohol dependents who smoke

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### Abstract

**Background:** Tobacco and alcohol are the most widely used psychoactive substances. Most of the studies show close relationship between the use of alcohol and smoking. In general population, smokers are more likely to drink than non-smokers.

**Materials and methods:** The cross-sectional study was conducted with 100 alcohol dependents who were taking treatment at two selected de-addiction centres. This study utilised the following measures: (a) socio-demographic data sheet, (b) alcohol and smoking history data sheet, (c) alcohol dependence scale, and (d) Fagerstrom test for nicotine dependence.

**Results:** There was a significant correlation between age of onset of smoking with age of onset of alcohol intake, years of alcohol dependence with years of smoking dependence, mean days of drinking with mean days of smoking, and average consumption of alcohol per day with number of cigarettes smoked per day.

**Conclusion:** Alcohol use and smoking are correlated; the link between alcohol and tobacco has important implications for those in the field of alcohol treatment.

Sreevani R, Aruna J, Gajendra. Relationship between alcohol and tobacco dependencies among alcohol dependents who smoke. *Dysphrenia*. 2014;5:114-8.

**Keywords:** Nicotine. Age of Onset. Risk Factors. Treatment Outcome.

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Received on 23 March 2014. Accepted on 3 May 2014.

### Introduction

Alcohol and tobacco are the substances often used together. Studies have found that people who smoke are much more likely to drink and vice-versa.[1] Extensive research supports the popular observation that "smokers drink and drinkers smoke".[2-4] Dependence on alcohol and tobacco is correlated. People who are dependent on alcohol are three times more likely than those in the general population to be smokers, and people who are dependent on tobacco are four times more likely than the general population to be dependent on alcohol.[5] Interactions between tobacco smoking and alcohol drinking have been shown by several studies.[2,4,6-8] Chronic smoking may contribute to a tolerance of the effects of alcohol consumption, and may increase alcohol metabolism.[9]

Health consequences of combined use, biological mechanisms and genetic vulnerabilities to co-dependence are barriers to the treatment of tobacco dependence in patients with alcohol and other drug use disorders.[1] More than half of patients in treatment for alcohol dependence die

from tobacco-related illnesses.[10] Yet, tobacco addiction often is not addressed in recovering alcohol dependents. One of the major barriers to treating tobacco dependence in patients with a co-occurring alcohol use disorder is the notion that it is too difficult to quit both alcohol and tobacco, and that attempts to quit tobacco might adversely affect the patient's recovery from alcohol use.[11,12]

Despite the high prevalence of tobacco use among people with substance use disorders, tobacco dependence is often overlooked in addiction treatment programmes. Treatment facilities often concentrate on the "primary" addiction to alcohol and treat tobacco use as a more benign addiction. Many treatment facilities do not screen for or treat tobacco dependence.[13] Several studies and a meta-analytic review have concluded that patients who receive tobacco dependence treatment during addiction treatment have better overall substance abuse treatment outcomes compared with those who do not.[13]

To control the harmful action of alcohol and tobacco use, and to reduce its impact on the individual and society, it



is important to treat for dependence on both substances. The link between alcohol and tobacco has important implications for those in the alcohol treatment field. Despite the extensive literature investigating relationship between alcohol dependence and tobacco smoking, a detailed examination is needed for the interaction between alcohol and smoking onset, years of dependence of alcohol and smoking, amount of consumption of alcohol and smoking among treatment seeking alcohol dependents.

The main aim of the present study is to find out the relationship between alcohol and tobacco use among alcohol dependents who smoke. The objectives of the present study are to find out the correlation between alcohol and smoking age of onset, years of dependence between alcohol and smoking, mean days of drinking with mean days of smoking, average consumption of alcohol per day with number of cigarettes smoked per day.

#### Materials and methods

The sample comprised of 100 alcohol dependents, who were recruited from two de-addiction centres of Kolar District, Karnataka, India by using convenience sampling technique. Inclusion criteria were: (a) diagnosed with alcohol dependent syndrome according to the tenth revision of the International Classification of Diseases and Related Health Problems (ICD-10);[14] (b) aged between 20 to 60 years; (c) able to understand regional language or English. Subjects with severe withdrawal symptoms, with severe psychotic symptoms were excluded.\*

#### Assessment

The study obtained permission from the concerned authorities of de-addiction centres. Data were collected on the basis of a single cross-sectional interview of the subjects who fulfilled the inclusion and exclusion criteria, and provided written informed consent. Subjects were administered the socio-demographic proforma, alcohol and smoking history proforma, alcohol dependence scale (ADS),[15] and Fagerstrom test for nicotine dependence (FTND).[16,17]

1. **Socio-demographic proforma:** It includes questions on their age, marital status, occupation, religion, type of family, area of residence, and mean monthly income.
2. **Alcohol and smoking history proforma:** It includes questions on age of onset of alcohol and smoking use, number of years of dependence, family history of alcohol use and smoking, number of days of drinking per month, number of days of smoking per month, average consumption of alcohol and number of cigarettes smoked per day.
3. **ADS:** It was developed by Skinner and Allen in 1982. It provides a quantitative measure of the severity of alcohol dependence. It consists of 25 items rated on zero to three scale, covers alcohol withdrawal symptoms, impaired

control over drinking, awareness of a compulsion to drink, increased tolerance to alcohol, and salience of drink-seeking behaviour.

Scoring: Dichotomous items are scored zero, one; three-choice items are scored zero, one, two; and four-choice items are scored zero, one, two, three.

Score range: Zero to 47; higher the value, the greater the dependence.

The ADS is widely used as a research and clinical tool, and studies have found the instrument to be reliable and valid. The ADS has been found to have excellent predictive value with respect to a Diagnostic and Statistical Manual of Mental Disorders (DSM) diagnosis. Moreover, the ADS yields a measure of the severity of dependence that is important for treatment planning, especially with respect to the intensity of treatment.[15]

4. **FTND:** It was developed by Heatherton, Kozlowski, Frecker, and Fagerstrom in 1991. This six item test was developed with the aim to diagnose the degree of dependence among smokers coming to a clinic seeking for help with stopping smoking rated on zero to three scale. The test can be filled out either by the therapist/researcher or the smoker. It contains items that evaluate the quantity of cigarette consumption, the compulsion to use, and dependence. It has been found to correlate with need to smoke in the night, ability to stop smoking, withdrawal symptoms including physiological variables. Total scores should range from zero to 11, with seven or greater suggesting physical dependence on nicotine.[16,17]

#### Statistical analysis

The Statistical Package for the Social Sciences (SPSS) software (version 15) was used to analyse the data. Descriptive statistics were used for all variables. Pearson's analysis was used for the correlation between alcohol and tobacco use scores.

#### Results

The socio-demographic characteristics of the study sample are presented in table 1. Mean age of the sample was  $33.33 \pm 8.93$  years. Fifty five per cent of the samples were married; majority (91%) belonged to Hindu religion. The largest proportion (74%) of the participants belonged to nuclear family. More than half of the subjects (53%) were residing in urban area. Forty per cent of the sample was private employees. Mean monthly income of the sample was Rs.  $13,585 \pm 9,105$ .

Subject's alcohol history was presented in table 2. Mean age of onset of alcohol intake was  $23.56 \pm 6.68$  years, mean years of dependence on alcohol was  $9.66 \pm 6.72$ , mean attempts of abstinence were  $1.66 \pm 2.49$ , mean days of drinking per month was  $24.94 \pm 5.70$ , mean average consumption of alcohol per day was  $284.30 \pm 181.30$  ml.



Nearly half of the sample (44%) had family history of alcohol intake, and among them 72.72% were fathers. Fifty nine per cent of the alcohol dependents having smoking habit, remaining (41%) alcohol dependents having chewing tobacco habit. Mean alcohol dependence score was 31.93 (8.03).

Smoking history of the subjects is presented in table 3. Mean age of onset of smoking is  $20.44 \pm 4.73$  years, mean number of years of dependence to smoking was  $10.73 \pm 5.77$ . Mean number of cigarettes smoked per day was  $11.98 \pm 6.84$ . Sixty eight per cent of the sample had family history of smoking, among them 49.15% were fathers. Mean smoking dependence score was  $5.34 \pm 2.09$ .

Table 4 shows positive correlation between the severity of cigarette smoked and severity of alcohol intake; as the

alcohol dependence score is increasing, smoking dependence score also increasing.

Pearson's correlation was calculated to examine the relationship between age of onset of alcohol intake with age of onset of cigarette smoking; the scores were positively correlated ( $r=0.47$ ) (table 5), indicating as alcohol intake started at younger age, cigarette smoking also started in younger age.

Table 6 indicates that very large correlation between years of dependence on alcohol with years of dependence on smoking; as years of dependence increased with alcohol, years of smoking dependence also increased.

The table 7 findings show that mean days of drinking alcohol is positively correlated with mean days of smoking; as days of drinking of alcohol is increased, days of smoking also increased. Regular drinkers are regular smokers.

Correlation results show that average consumption of alcohol per day is positively correlated with number of cigarettes smoked per day (table 8); indicating that alcohol

**Table 1: Description of socio-demographic characteristics of subjects (N=100)**

Socio-demographic characteristics		Frequency
Mean age (SD)		33.33 (8.93)
Education	Illiterate	7
	Up to tenth standard	42
	Tenth standard to pre-university	26
	Degree	14
	Degree and above	11
Marital status	Single	45
	Married	55
Religion	Hindu	91
	Muslim	7
	Christian	2
Type of family	Nuclear	74
	Joint and Extended	26
Area of residence	Urban	53
	Rural	47
Occupation	Agriculture	33
	Govt employee	9
	Private employee	42
	Own business	10
	Unemployed	6
Mean monthly income (SD)		Rs. 13,585 (Rs.9,105)

SD=standard deviation

**Table 2: Description of alcohol history among subjects (N=100)**

Alcohol history		Frequency/Mean (SD)
Mean age of onset of alcohol intake		23.56 (6.68)
Mean number of years of dependence on alcohol		9.66 (6.72)
Mean number of attempts of abstinence		1.66 (2.49)
Mean number of days of drinking per month		24.94 (5.70)
Mean average consumptions of alcohol per day		284.30 (181.30)
Family history of alcohol intake	Yes	44
	No	56
History of alcohol intake	Father	32 (72.72)
	Brother	8 (18.80)
	Others	4 (9.09)
Other substance abuse	Smoking	59
	Chewing tobacco	41
		0
	Other	
Mean alcohol dependence score (maximum score 47)		31.93 (8.03)

SD=standard deviation



**Table 3: Description of smoking history among alcohol dependents (N=100)**

Smoking history		Frequency/Mean (SD)
Mean age of onset of cigarette smoking		20.44 (4.73)
Mean number of years of dependence to smoking		10.73 (5.77)
Mean number of days of smoking per month		28.88 (4.17)
Mean number of cigarettes smoked per day		11.98 (6.84)
Family history of smoking	Yes	40 (68%)
	No	19 (32%)
History of smoking	Father	29 (49.15)
	Brother	8 (13.55)
	Others	3 (5.08)
Mean smoking dependence score (maximum score ten)		5.34 (2.09)

**Table 4: Correlation between alcohol dependence score and smoking dependence score among alcohol dependents**

Variables	Smoking dependence score	p value
Alcohol dependence score	0.52	0.001

**Table 5: Correlation between age of onset of alcohol intake and age of onset of smoking**

Variables	Age of onset of cigarette smoking	p value
Age of onset of alcohol intake	0.47	0.001

**Table 6: Correlation between years of alcohol dependence and years of smoking dependence**

Variables	Years of dependence on smoking	p value
Years of dependence on alcohol	0.51	0.001

**Table 7: Correlation between mean days of drinking alcohol and mean days of smoking**

Variables	Mean days of smoking	p value
Mean days of drinking alcohol	0.40	0.001

**Table 8: Correlation between average consumption of alcohol per day and number of cigarettes smoked per day**

Variables	Number of cigarettes smoking per day	p value
Average consumption of alcohol per day	0.26	0.04

consumption per day increased with number of cigarettes smoked per day.

### Discussion

A positive correlation was detected between the severity of cigarette smoking and severity of alcohol intake, age of onset of alcohol intake with age of onset of smoking, years of alcohol dependence and years of smoking dependence; mean days of drinking was positively correlated with mean days of smoking, average consumption of alcohol per day was positively correlated with number of cigarettes smoked per day. In light of the multiple levels of correlation of variables, each tends to be a risk factor for the other.

### *The present study results were consistent with previous studies*

A study was conducted on men and women to find out co-occurrent use of cigarettes and alcohol; results showed that there is more alcohol consumption among current as well as former smokers than among non-smokers.[18] In health maintenance study, there were more alcohol-dependent individuals among smokers than among non-smokers.[19] A study was conducted on alcohol dependents who used both tobacco and alcohol in the preceding week. Results showed that the prevalence of smoking among alcohol dependents was 88%. The amount of tobacco smoked was correlated to the amount of alcohol consumed and severity of alcohol dependence.[20] A national survey study assessed relationship between tobacco use and substance use disorders among community living sample; results showed that current daily smokers had a higher rate of alcohol dependence than never, former or occasional smokers.[21]



A trend toward lower ages of alcohol use is noted and Bhagabati *et al.*[22] studied the pattern of alcohol consumption in underage population in an Indian city. One hundred and fifty one (22.2%) subjects out of total 680 participants from six randomly selected schools have ever had alcoholic beverages like beer, wine or liquor.[22]

### Limitations

Study was done on cross-sectional data from a small sample size from a deaddiction center. Information was gathered as self-statements and no biochemical verification was done, there are available biochemical measurements [23]. The FTND had been assessed in current smokers only.

### Recommendations

The relationship between drinking and smoking should be targeted at both. Studies should be done with bigger and heterogeneous samples. There is a crucial need to consider smoking when treating alcohol.

### Conclusion

Prevalence of tobacco use is high among alcohol users. Addition of tobacco dependence treatment during addiction treatment will have better overall substance abuse treatment outcomes.

**Source of support:** Nil. **Declaration of interest:** None.

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