Original Article

Profile of Nicotine Use Among Alcohol Dependent Patients Visiting a Tertiary Care Center in North India

Rizwana Quraishi, Raka Jain, Yatan Pal Singh Balhara

ABSTRACT

Background: Use of tobacco among alcohol dependent population is quite frequent. This co-morbidity increases the risk for various diseases. Understanding the pattern of tobacco use with co-morbid alcohol use may help in planning appropriate prevention/treatment strategies. The study aimed at examining the profile and pattern of nicotine use among alcohol dependent patients visiting a tertiary care treatment center in North India. **Materials and Methods:** Male patients fulfilling diagnostics and statistical manual of mental disorder fourth edition, criteria for nicotine and alcohol diagnostics and statistical dependence, attending the out-patient department of the tertiary care treatment center were recruited after obtaining informed consent. The socio-demographic profile, drug use history, nicotine associated health problems and general health problem were recorded. Motivation to stop tobacco use was assessed qualitatively using the direct questions about their interest and intentions to quit. **Results:** A total of 150 subjects were included in the study. The mean age of the study sample was 37.6 ± 10.44 years. Tobacco was reported as the gateway drug in 90% of the cases. Exclusive bidi use reported in 42% of the subjects. Mean duration of bidi and co-morbid alcohol use was higher than cigarette or smokeless tobacco use. Self-reported health problems associated with nicotine use and general health was reported by 41% and 39% of the subjects. Unsuccessful past quit attempts was present in 85% cases. More than 90% of subjects remained interested in quitting the tobacco use. An increased liver enzyme (aspartate transaminase, alanine transaminase and gamma-glutamyl transferase) were observed in 43, 32 and 47% of the cases. **Conclusion:** The results suggest the nicotine and alcohol dependent patients represent a separate population requiring higher attention from the treating physician.

Key words: *Alcohol, nicotine, North India, profile, tertiary care center*

INTRODUCTION

Tobacco is the most commonly used substance world-wide. Globally, around 82% of the tobacco users live either in low or middle-income countries.[1] The global adult tobacco survey reports tobacco use in 35% of adults.[2] A recent nation-wide study on tobacco-associated deaths in India reported smoking to cause one in five deaths in men (aged 30-69 years) and estimated to cause one million deaths annually.[3]

A significant association exists between alcohol and tobacco misuse.[4] Among alcohol dependent population use of tobacco was estimated to be more than 80%[5,6] and it is estimated that smokers have a significantly increased risk for developing alcohol related disorders.[7] Studies have shown that 80% of alcoholics smoke regularly and that a majority of them will die of smoking related disorder rather than alcohol related

Department of Psychiatry, National Drug Dependence Treatment Centre, All India Institute of Medical Sciences, New Delhi, India

Address for correspondence: Dr. Raka Jain
Room No. 4080, National Drug Dependence Treatment Centre, All India Institute of Medical Sciences, New Delhi - 110 029, India.
E-mail: rakajain2009@gmail.com

disease.[8] Recent, meta-analyses show that concurrent tobacco and alcohol misuse significantly increase the risk for upper digestive tract[9] and respiratory tract[10] carcinoma. Alcohol consumption is associated with a significant decline in lung capacity.[11]

Tobacco use is widely prevalent among substance using patients in treatment settings. A national level treatment center in India reported tobacco use along with co-morbid alcohol use in 36.4% of subjects coming to a tobacco cession clinic.[12] Another study from a teaching hospital in India reported co-morbid alcohol use among 52% of the subjects presenting to tobacco cessation clinic.[13] This co-dependent sub-population may have a higher level of nicotine dependence and reported difficulty in quitting tobacco use. The present study describes the profile of nicotine and alcohol dependent patients visiting a tertiary care center from North India.

MATERIALS AND METHODS

The study was carried out for over a period of 1 year from 2011 to 2012 at National Drug Dependence Treatment Center (NDDTC), All India Institute of Medical Sciences, New Delhi, India. The center is actively involved in the treatment, research and academic activities related to substance use. The center is visited by patients mainly coming from North India. The study protocol was approved by the Institutional Ethical Committee. A written informed consent was obtained prior to the recruitment of the subjects.

Study population

Subjects coming to NDDTC out-patient department for treatment were recruited in the study. The inclusion criteria was: (1) Male subjects in the age of 18-65 years, (2) average use of 10 cigarettes per day for the last 12 months along with alcohol use (3) fulfill (diagnostics and statistical manual of mental disorder fourth edition, American psychiatry Association, 1994)[14] criteria for nicotine and alcohol dependence (4) not current poly-substance abuser [5] no major physical or mental health problem (6) provided informed consent to participate in the study. All the subjects were from the Northern India. Patients reporting substance abuse other than alcohol were excluded from the study.

Following inclusion, the socio-demographic profile (including age, sex, marital status, employment and education) medical history, smoking and drinking history and current smoking behavior and medical co-morbidity, were recorded. Self-reported medical co-morbidity included nicotine associated health problems such as coughing, wheezing, shortness of breath, in the last 3 months, graded as none, mild,

moderate and severe. General health problem present or absent included tuberculosis and chronic obstructive pulmonary disorder (COPD), jaundice, hypertension, diabetes or other problems in the last 3 months based on medical records or self-report. Nicotine dependence was assessed by using Fagerstrom test for nicotine dependence (FTND) scores and FTND-smokeless tobacco (ST)).[15,16] The motivation to stop tobacco use was assessed qualitatively by means of simple direct questions about their interest and intentions to quit.

Biochemical liver function tests and urine analysis

For clinical assessment from each patient 5 ml of blood and 10 ml of urine sample was collected under close supervision by the center's laboratory staff. All the samples were analyzed at the drug abuse-testing laboratory of the center. The blood sample was centrifuged shortly after collection and plasma and urine were stored at-20°C until analysis. The biochemical parameters assessed in the blood sample include bilirubin, albumin, serum transaminases (aspartate transaminase (AST) and alanine transaminase (ALT)) and gamma-glutamyl transferase (GGT). All the biochemistry reagents were purchased from Roche diagnostics and performed on echo plus biochemistry auto-analyzer (Logotech Pvt. Ltd., India).

Statistical methods

The data were recorded in to a Microsoft Excel spreadsheet. Data analysis was performed with SPSS version 12 (IBM SPSS Statistics 19.0 - August 2010). Descriptive statistics were used to describe the socio-demographic, clinical and laboratory characteristics. Independent sample *t*-test and one way ANOVA was conducted to compare the outcomes of interest. A *P* value of 0.05 was taken for statistical significance.

RESULTS

Demographic profile and tobacco use characteristics

A total of 150 male subjects fulfilling the inclusion criteria were included in the study. The socio-demographic characteristics have been shown in Table 1. The mean age of study sample was 37.6 ± 10.44 years. A large majority of the subjects were educated below secondary levels (78.7%), employed (88%) and married (89%). 60% of the subjects visiting the center were coming from an Urban area. Monthly income of the subjects was reported to be within the low (42%) or middle-income group (35%).

Bidi use was found to be present in 42% of the subjects whereas, both smoking and chewing was observed in (34%). Moreover, use of only ST was seen in (14%) and use of cigarette in (7%) of subjects. The mean age of initiation of bidi (19.9 ± 6.5), cigarette (20.3 ± 6.6)

Table 1: Profile of the nicotine use among alcohol dependent patients (*n*=150)

Characteristics	No. (%)/mean (±SD)
Age (in years)	37.6±10.44
Education, *n*	
Illiterate	19 (12.7)
Read and write	29 (19.3)
Below secondary	70 (46.7)
Secondary and above	32 (21.3)
Residence, *n*	
Rural	65 (40.8)
Urban	94 (59.2)
Employment, *n*	
Employed	132 (88.0)
Unemployed	18 (12.0)
Marital status, *n*	
Married	134 (89.3)
Unmarried	16 (10.7)
Monthly income, *n*	
None	16 (10.7)
Low (<5000 INR)	63 (42.0)
Medium (<25000 INR)	53 (35.2)
High (>25000 INR)	18 (12.0)
Type of tobacco use, *n*	
Smoking only (bidi/cigarette) (78)	78 (52)
Chewing only (21)	21 (14)
Smoking and chewing both (51)	51 (34)
Mean age at initiation of tobacco use (years)*	
Any bidi use (105)	19.9 (6.5)
Any cigarette use (16)	20.3 (6.6)
Any smokeless tobacco use (72)	20.5 (5.6)
Mean duration of tobacco use (years)*	
Any bidi use (105)	18.9 (9.7)
Any cigarette use (16)	14.2 (11.9)
Any smokeless tobacco use (72)	14.5 (8.6)
Tobacco quantity, mean (SD)*	
Any bidi use (105)	23.9 (12.3)
Any cigarette use (16)	18.8 (9.3)
Any smokeless tobacco use (72)	9.6 (9.6)
Mean duration of alcohol use (years)*	
Among any bidi use (105)	11.7 (9.0)
Among any cigarette use (16)	7.2 (8.7)
Among any smokeless tobacco use (72)	8.3 (8.2)

*Total is >150 as these are not mutually exclusive categories;
INR – Indian rupees; SD – Standard deviation

or chewing tobacco (20.5 ± 5.6) use was not found to be significantly different from each other. The mean duration of bidi use (18.9 ± 9.7) was found to be significantly higher to ST use (14.5 ± 8.6) ($P = 0.001$). The mean quantity of bidi use was highest (23.9 + 12.3) when compared with cigarette (18.75 ± 3.9) or ST use (9.9 ± 9.6). Duration of alcohol use among bidi smokers was longest (11.7 ± 9) and found to be significantly different among cigarette or ST use ($P = 0.002$).

Clinical profile
The clinical profile of nicotine dependents patients is presented in Table 2. All the subjects reported

co-morbid alcohol use with tobacco as the gateway drug in 90% of the cases. Problems associated with nicotine use such as shortness of breath, dizziness and coughing was self-reported by 41% of the subjects. General health problems such as COPD, asthma, hypertension, diabetes, low appetite, insomnia, anxiety, depression etc., was self-reported by 39% of the subjects in the study.

The nicotine dependence FTND scores were found to be same in all type of tobacco users with more than half cases scoring high and very high points. Unsuccessful past quit attempts were reported by more than 85% of the users. The maximum length of abstinence was found to be less than a week's time period in 85% of the subjects. More than 90% of the subjects remained interested in quitting the tobacco use.

Laboratory profile
The biochemical liver parameters are presented in Table 3. The sample presented with increased bilirubin levels among 38% of subjects while increased liver enzymes (AST, ALT and GGT) is observed in 43, 32 and 47% of the cases.

DISCUSSION

The present study was aimed to report the profile of nicotine and alcohol dependent subjects who were seeking treatment at a tertiary care-center. Male subjects were included in this study as only a miniscule proportion of female patients reported to treatment settings in India.[17] The mean age of the study population was found to be 37.6 years, with 80% of the subjects educated below secondary level employed with low or medium monthly income. Other studies from this region also reported advancing age, illiteracy and lower socio-economic status as the major factors to be associated with smoking and alcohol use in treatment settings.[12,13]

The nicotine use was primarily found to be either by smoking (beedi/cigarette) or by smokeless means (gutkha, pouch) with more than one fourth of the subjects using both. Three fourth of the subjects reported beedi use, which is in accordance with earlier studies with 89% exclusive beedi smokers. Beedi is the preferred mode of tobacco use in India because of economic reasons as it is cheaper than cigarette.[13,18] The mean duration and quantity of bidi use was highest among all the groups. The duration of alcohol use is also high among bidi use group.

Smoking was reported to be associated with an increased risk of death in men aged 30-69 years (odd ratio, 1.7; 99% of confidence interval, 1.6-1.8)

Table 2: Clinical characteristics of the patients (*n*=150)

Characteristics	n (%)/mean (SD)
Nicotine associated health problem, *n**	
Absent	88 (58.7)
Mild	27 (18.0)
Moderate to severe	35 (23.3)
General health problem, *n**	
Present	59 (39.3)
Absent	91 (60.7)
Nicotine dependence score, mean (SD)	
Smoking only (78), FTND, (%)[+]	6.4 (1.7) (77)
Chewing only (21), FTND ST, (%)[+]	6.9 (1.9) (76)
Smoking and chewing both (51)	
FTND, (%)[+]	5.4 (2.1) (51)
FTND ST, (%)[+]	5.6 (1.7) (55)
Quit attempts, *n*	
0-5 unsuccessful attempts	128 (85.3)
Significant (>1 month) abstinence attempts	22 (14.7)
Length of abstinence, *n*	
Less than 1 week	128 (85.3)
Less than 1 month	13 (8.7)
1-6 months	9 (6.0)
Interest in quitting, *n*	
Very interested	87 (58.0)
Somewhat interested	55 (36.7)
Not interested	8 (5.3)

*Self-reported/informant; [+]% with high FTND and FTND ST scores (above 5 points); FTND – Fagerstrom test for nicotine dependence; ST – Smokeless tobacco

Table 3: Laboratory profile of the patients (*n*=150)

Variable	Bilirubin (mg/dl)	Albumin (g/dl)	AST (IU/L)	ALT (IU/L)	GGT (IU/L)
Median	0.90	4.5	46.5	39.0	50.0
Range minimum-maximum	0.4-2.66	3.2-6.0	15-486	10-233	10-1678
Abnormal range %	38.6 ↑	9.3 ↓	42.6 ↑	32 ↑	47.3 ↑

AST – Aspartate transaminase; ALT – Alanine transaminase; GGT – Gamma-glutamyl transferase

by an Indian study.[3] Other Indian studies depict smoking related tuberculosis, caused 7 lakhs deaths annually from respiratory or vascular disease.[19] 40% of the present study population exhibited nicotine associated and general health problems (ranging from mild to severe).

FTND and heaviness of smoking index (HSI) are used in nicotine dependence studies to measure the degree of nicotine dependence.[20,21] The FTND and HSI scores assess physical dependence on nicotine and were found to predict nicotine cessation rate.[22] The nicotine dependence FTND and HSI scores were found to be high and very high in more than 60% cases. Unsuccessful past quit attempts were reported by more than 85% of the users with the maximum length of abstinence was found to be less than weeks. More than 90% of the subjects remained interested in quitting the tobacco use. The current report suggests smokers

among alcoholics as a special population with high FTND scores and unsuccessful quit attempts, which is in accordance with the literature.[12,13] These findings warrant a higher attention of the treatment provider among the nicotine and alcohol dependent group.

The biochemical investigation revealed hyperbilirubinemia in 38% of the subjects, which have earlier shown to correlate with alcohol intake.[23] Increased liver enzymes (AST, ALT) were present in 43 and 32% respectively. The level of increase in serum transaminase depends markedly on the degree of liver damage, found frequent among heavy alcohol users.[24] The elevation in GGT was reported among half of the study subjects as also reported in the previous study. Theses enzymes are more specific to the amount of alcohol consumed.[23,24]

The present study has few limitations firstly the use of tobacco and alcohol consumption was self-reported by the subject and is not verified by any biological marker. Secondly, the sample size is small as the patients typically do not reveal their tobacco use. The subjects visited the center mainly for alcohol treatment.

In spite of the above limitations, the present study describes the profile of nicotine dependent subjects with alcohol co-morbidity in a treatment setting from North India. Tobacco was found to be the first substance of use in 90% of the subjects with alcohol use co-morbidity. Tobacco use related disorders and deaths are preventable and the step toward prevention comprises the understanding of profile of tobacco use with co-morbid alcohol use. The results are from only a single treatment center therefore cannot be generalized. Further research is needed from different treatment settings to understand the profile of tobacco use.

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