

ASSESSMENT OF ALCOHOL / SUBSTANCE DEPENDENCE USING MAST(R) SCORE AND NICOTINE DEPENDENCE USING FAGERSTROM TEST - A PROSPECTIVE STUDY IN PSYCHIATRIC POPULATION

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ABSTRACT:

Aim: The study was done to assess the alcohol / substance/nicotine dependence in patients with psychiatric illness.

Settings and Design: A prospective study was carried out in the psychiatric in-patient department of a multispeciality tertiary care teaching hospital for a period of eight months with the approval of Institutional Ethics committee.

Materials and Methods: 80 patients with Alcohol Dependence Syndrome / Substance abuse and other associated psychiatric illness (co morbid) were enrolled in the study. 47 were grouped under Alcohol Dependence Syndrome (ADS) and 33 patients who had alcohol dependence and co-morbidities were under ADS+ co-morbid group. Sociodemographic details and clinical variables (hepatic abnormalities and liver function tests) were obtained and subjected to statistical analysis using chi square test. MAST (Revised) questionnaire was used for all the 80 patients and Fagerstrom test was used for smokers.

Results: There was no significant difference in the socio demographic variables and hepatic abnormalities between the groups, except in the liver function test. The MAST (revised) questionnaire identified problematic drinkers who were showing tendency towards psychosis and Fagerstrom test revealed that majority of the smokers were nicotine dependent.

Conclusion: Substance abuse is an addictive relapsing disorder resulting in psychosocial problems. Social support at home and by friends is very essential as it is a major contributor for abstinence. A clinical pharmacist can be an active member of the healthcare team and play a pivotal role in educating the patients about compliance to drug therapy and the significance of de-addiction and rehabilitation therapy.

Keywords: *alcohol abuse, substance abuse, psychosis, alcohol related disorders.*

Introduction: Substance abuse, defined as the problematic use of tobacco, alcohol or illicit drugs, has been considered as the number one health problem that affects millions of people worldwide.^[1,2] Substance related disorders have become matters of global concern because of impact on individual health, familial and social consequences. Patients who abuse alcohol and drugs are much more likely to develop medical problems than the general population. Alcoholism was recognized as a disease by the American Medical Association in 1956. Early editions of the American Psychiatric Association's **Diagnostic and Statistical Manual of Mental**

Disorders (DSM) considered the presence of tolerance or withdrawal symptoms as a major requirement for the diagnosis of alcohol or drug dependence. The requirement was later modified in the fourth edition of this publication to loss of control and failure to abstain from using the substance despite the evidence of the problems it causes.^[3] Fatty liver, hepatoma, delirium tremens are considered to be the important medical complications of alcohol dependence.^[4] The high rate of co-occurrence of substance disorders and other psychiatric disorders is well established and it occurs so often.^[5] An estimation of 45% of individuals with alcohol

use disorders and 72% of individuals with drug use disorder had at least one co-occurring psychiatric disorder.^[6] Co morbidity is greater in individuals who are dependent on illicit drugs, compared to alcohol dependent individuals.^[7] There is evidence that bipolar disorder patients are at increased risk for alcohol abuse during the manic phase of their illness. Depression was found to be the most common co morbid disorder among alcoholics.^[8] Neurobiological similarities between major depression and substance use disorders likely contribute to both symptoms overlap and high rates of co morbidity.^[9]

Most important is the distinction between addiction and problem use of a substance. A problem drinker or a drug user may not yet have experienced a major loss of control but may have an undiagnosed medical or social problem. In case of a full-blown addiction, despite negative consequences, patients continue to use alcohol or drugs, have a compulsion to continue using alcohol or drugs, and are in denial about the effects on themselves and others.

The well developed medications for alcohol related disorders are benzodiazepines, anticonvulsants, antipsychotics, Naltrexone, Disulfiram, Acamprosate, etc.^[10] Nicotine dependence is the most prevalent, most deadly, costly, yet most treatable of the substance dependencies. Cannabis occupies 4th place in world wide popularity among psychoactive drugs after caffeine, nicotine and alcohol.^[11]

SUBJECTS AND METHODS: This study was conducted in psychiatric in-patient department of a multispeciality tertiary care teaching hospital after obtaining the approval of the Institutional Ethics Committee.

A total of 80 male patients, aged between 23 to 55 years, diagnosed with Alcohol Dependence Syndrome / Substance abuse disorder and also other associated psychiatric illness (co morbid) and admitted in psychiatry in-patient wards during the period of September 2008 to march 2009 were enrolled in the study. Of these 80 patients, 47 with Alcohol Dependence Syndrome/Substance abuse disorder were under Alcohol Dependence Syndrome (ADS) group and 33

patients who had ADS and other co-morbidities were under ADS+ Co-morbid group.

A patient data collection form was specially designed for the study and sociodemographic details such as age, marital status, educational status, family history of alcohol/substance abuse, smoking status, age of onset and duration of abuse, clinical variables such as liver function test results (SGPT, SGOT and globulin) and hepatic abnormalities (fatty liver, hepatomegaly and fatty liver + hepatomegaly) were collected for both the groups and analyzed. The drug prescribing patterns for the study population was also analyzed and tabulated. All the patients were subjected to MAST(R) questionnaire and current smokers were subjected to the FAGERSTORM TEST.

MAST (Michigan Alcoholism Screening Test) revised^[12]:

MAST is one of the most widely used measures for assessing alcohol abuse. It is a questionnaire designed to provide a rapid and effective screening for lifetime alcohol related problems and alcoholism and it has been productively used in a variety of setting with varied populations. It is comprised of 22 questions. These questions help alcoholics to be aware of their level of abuse of alcohol. This questionnaire mainly focuses on alcohol abuse, but cannot be used for other drugs and is scored by allocating 1 point to each YES answer, except for question 1 & 4, where 1 point is allocated for each NO answer and totaling the responses. Screening test scoring ranges are: 0-2 – No apparent problem, 3-5 – Early to middle problem drinker, 6 or more – Problem drinker.

Fagerstrom Test for Nicotine Dependence^[13]

This test was developed by Dr. Karl Fagerstrom, one of the world's leading authorities on the effects of cigarette smoking. It is designed to give a basic feedback on nicotine dependence and the treatment is dependent on the magnitude of the nicotine dependence as scored by Fagerstrom Nicotine dependency test.

The Fagerstrom Test for Nicotine Dependence is applied only to patients who have a history of smoking and is widely used in treatment studies as it was proven reliable and valid. The test consists of six questions with a total

scoring of ten. A score of less than or equal to 4 on this scale indicates that an individual has very low or no nicotine dependence, where as a score of greater than 4 suggest that an individual is highly dependent on nicotine. This scale can also predict which smokers are likely to quit smoking.

Statistical analysis

The results were statistically analyzed using Instat software and presented as Mean ± SD. Chi square test was performed for hepatic abnormalities, liver function test results, MAST (R) scores and the Fagerstrom Test scores of both the groups and a p-value of <0.005 was considered significant.

RESULTS

A total of 80 patients were taken for the study of which, 47 were classified under Alcohol Dependence Syndrome (ADS) group and 33 patients were under co-morbid group (ADS + co-morbidity). The co-morbidities observed in these patients were, psychosis in 15 patients (45.45%), delirium tremens in 3 (9.09%), cannabis induced psychosis in 3 (9.09%), maniac complaints in 7 patients (21.21%) and depression was found in 5 patients (15.15%).

Table 1: Sociodemographic Variables of ADS and ADS + Co-morbid group of patients

Variable	ADS (n=47)	ADS+ Co-morbidity (n=33)	χ ²	p
Marital status				
Single	6(12.77%)	6(18.149%)	0.122	0.726
Married	41(87.23%)	27(81.81%)		
Education				
Up to school	40(85.10%)	28(84.8%)	0.001	0.9746
Up to graduation	7(14.89%)	5 (15.2%)		
Family history of alcoholism				
Yes	28(59.57%)	21(63.63%)	0.018	0.893
No	19(40.43%)	12(36.37%)		

Table 1 shows the Sociodemographic variables of the ADS and ADS+ co morbid groups. There was no significant difference in the

marital status, educational status and the family history of alcohol /substance abuse among both the groups. Literary status was low (up to school) and family history was high in both the groups. Similarly the percentage of married men was higher in both the groups.

Table 2: Age of Onset and Duration of Substance Abuse in the study population

Variable	Range (Years)	Mean Age (±SD)	
		ADS (n=47)	ADS+ Co morbidity (n=33)
Age (Years)	23-55	37.89 ± 8.54	35.18±8.34
Age of first drug use	11-38	23.15 ± 6.07	22.67±6.51
Duration of use	1-40	14± 8.09	10.92±8.46

The mean age, age of onset and duration of consumption were described in Table 2.

Table 3: Associated disease conditions and clinical variables in the ADS and ADS+Co-morbid group

Variable		ADS (n=47)	ADS+ Co morbidity (n=33)	χ ²	p
Hepatic abnormalities					
Fatty liver		7(14.89%)	1(3.03%)	2.133	0.3442
Hepatomegaly		4(8.51%)	1(3.03%)		
Fatty liver + Hepatomegaly		2(4.25%)	2(6.06%)		
Liver function test					
ALT	Increased	26(55.31%)	7(21.21%)	7.952	0.004*
	Normal	21(44.68%)	26(78.78%)		
AST	Increased	21(44.68%)	6(18.18%)	4.961	0.025*
	Normal	26(55.31%)	27(81.81%)		
Globulin	Increased	20(42.55%)	3(9.09%)	9.027	0.002*
	Normal	27(55.44%)	30(90.90%)		

Table 3 depicts the clinical variables analyzed in both the groups. Hepatic abnormalities were observed in both the groups to a lesser extent and the difference was not significant, where as the liver function tests were significantly increased in ADS group.

Table 4: Fagerstrom and MAST (R) results in the study population

	ADS with smoking (n=30)	ADS+ Co morbidity with smoking (n=22)	χ^2	P
Fagerstrom test				
Dependent(>4)	19(63.33%)	18(81.81%)	1.038	0.2527
Non-dependent(\leq 4)	11(36.66%)	4(18.18%)		
MAST (R)				
No apparent problem	0	1(3.03%)	1.894	0.388
Early/Middle problem drinker	5(10.64%)	2(6.06%)		
Problem drinker	42(89.6%)	30(90.91%)		

The severity of alcohol dependence and nicotine dependence was assessed using MAST(R) and Fagerstrom test respectively. According to MAST(R) questionnaire, almost 90% of the patients were in the category of “problematic drinker” in the ADS and ADS+ comorbid group. There were 30 smokers in ADS group and 22 smokers in ADS + co morbid group and all were men. Nicotine dependence was higher in both the groups (63.3% in ADS and 81.8% in ADS+ co-morbid groups respectively) as per Fagerstrom test results (Table 4).

Table 5: Medications Prescribed to the patients

Drugs	ADS (n=47)	ADS+ Co-morbidity (n=33)
Chlordiazepoxide	47(100%)	24(72.72%)
Benzodiazepines ^a	43(91.48%)	33(100%)
Haloperidol	6(12.76%)	19(57.57%)
Trihexyphenidyl	6(12.76%)	23(69.69%)
Carbamazepine	6(12.76%)	6(18.18%)
Metadoxine	26(55.13%)	8(24.24%)
Vitamin B. complex	18(38.29%)	7(21.21%)

a: Diazepam, Nitrazepam

Chlordiazepoxide and benzodiazepines like diazepam and nitrazepam were the commonest drugs employed for medical treatment and

were used in all alcohol related conditions which is shown in Table 5.

DISCUSSION

This study has identified Alcohol Dependence Syndrome patients who were under high risk of developing psychosis and Alcohol Dependence Syndrome / Substance abuse patients who had developed psychiatric illness.

Social factors were found to be the primary etiological cause for Alcohol dependence/Substance abuse in these patients. Most (98%) of these patients were introduced to alcohol consumption by friends. The mean age of the study population in both groups was 36yrs (\pm 8.5) and 84% of patients were married. A strong association between alcohol/substance abuse and young age, low literacy and associated psychiatric co morbidities were observed in this study in accordance to the study done by Mertens et al.^[14]

Ethanol is the psychoactive constituent of alcoholic beverages such as brandy, beer, wine and distilled spirits. Ethanol commonly referred to as alcohol, is next to caffeine in drug abuse. Alcohol dependent patients are known to show certain personality traits, such as being more assertive and most often anti-social. They are also significantly more emotional, anxious and depressed, with anxiety being an important factor in the initial development and subsequent dependence on alcohol. Many patients use alcohol to reduce their anxiety. Alcohol Dependence may slowly lead to clinically significant depression because of its inherent quality of lowered self-esteem, strong inhibition against aggressive impulses.^[15]

In this study, majority of the patients were married which suggests that marital life problems is one of the cause for alcohol consumption. This can be minimized by providing professional counseling to both the patient and the spouse.

Out of 80 patients, 49 patients have shown a family history of alcoholism. In Harrison’s Principles of Internal Medicine ^[16], it has been clearly stated that, “Close relatives of alcoholics who themselves have no other psychiatric disorders have an approximately fourfold increase risk for alcoholism” but are

not significantly more vulnerable to other psychiatric illness.

The age of onset of drinking, starts at the adolescent age and continued to the adult age, which indicates that adolescents are more vulnerable to alcohol consumption and must be educated well about the disorders associated with alcohol consumption. This study indicated that those who started alcohol consumption at an early age have shown increased duration of dependence even up to 30yrs. Adequate methods of treatment and counseling are very essential to decrease the dependence and preventing the onset of psychiatric illness.

Apart from its degenerative alterations of liver morphology, this study documents alcohol induced gastritis and chronic pancreatitis. No incidence of cancer of the stomach, throat and intestine were seen in the study.

High success rates for quitting was seen when patients were diagnosed with substance abuse related medical disorder. The incidence of hepatomegaly in alcohol abuse patients have motivated a few patients to quit.

The MAST(R) questionnaire had rated alcohol abusers as “Non problematic drinkers”, “Early to middle problem drinkers” and “Problematic drinkers”. The terminology used clearly indicates that the emotional stress and anxiety experienced by these patients can lead to a highly traumatic state of living. It necessitates the event of getting treated by a psychiatrist. The MAST(R) questionnaire was used in this study. This questionnaire was chosen as a rapid and effective screening test of alcoholism. It was found that this questionnaire was very useful to identify patients who were showing tendency towards psychosis. A score of ≥ 6 was identified in 42 patients (ADS), who may need to be given additional pharmacotherapy to prevent the development of full blown psychosis.

Fagerstrom Test: This test is valuable to distinguish smokers who develop nicotine Dependence. Identifying such patients and providing appropriate pharmacotherapy can reduce their morbidity and mortality and prevent behavioral disorders at the right time.

The medications prescribed in this study were analyzed. Haloperidol and Trihexyphenidyl were indicated in high number of patients in the co morbid group for their psychotic

features, while liver protectant Metadoxine was prescribed for majority of patients falling under ADS group which again suggests that alcohol dependent patients are at high risk for developing alcoholic complications like hepatic abnormalities and CNS disorders.

The treatment schedule consisted of Benzodiazepines (Diazepam, Chlordiazepoxide), Anticonvulsants for seizures (Carbamazepine, Valproates), Antipsychotics (Haloperidol), Disulfiram to resist alcohol consumption under medical supervision, Lithium for Bipolar affective disorders. Co-occurring psychiatric disorders were treated with the same regimens, as medications used to treat alcohol abuse are also effective in patient with a co-occurring psychiatric disorder.

Substance abuse/Drug dependence is a chronic relapsing disorder, as several attempts are needed before patients finally quit for good. If problem drinking is identified, even brief advice given to the patient can be helpful. These patients have experienced some negative consequences but have not yet experienced a major loss of control. Abstinence of alcohol / substance abuse can be achieved by sustained perseverance and motivation after every attempt to quit fails. This may be attained by counseling the patient and patient care takers and pharmacotherapy for prevention of relapses. If problem drinking is identified, brief advice can be helpful.^[17]

CONCLUSION

As a chronic disorder, substance abuse tends to relapse. The physician and pharmacist as a healthcare team can play a pivotal role by dealing with the patient and family in a nonjudgmental manner. Patients must be motivated by problem solving Behavior Therapy and adequate pharmacotherapy. Patients who have failed in previous attempts of quitting may be encouraged to take small steps towards achieving their goal of quitting. Patient's preference to pharmacotherapy must also be understood, so as to enhance compliance.

Statement of competing interest: 'the authors have no competing interests'

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Site this article as: Kannan Gopal, Anitha T, Vanitha Rani N, Thennarasu Palani, Vasantha Janardhan, *Assessment of Alcohol/Substance Dependence Using MAST (R) Score and Nicotine Dependence using Fagerstrom Test- A Prospective Study in Psychiatric Population* Int J Medicine and Allied Health Sciences, 2014; 4: 366-371