

METABOLIC SYNDROME IN ALCOHOL DEPENDENT PATIENTS

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ABSTRACT

Background: Metabolic syndrome includes a cluster of changes in insulin resistance, abdominal obesity, elevated blood pressure, dyslipidemia. The relationship of Metabolic syndrome and alcohol is controversial. Few studies have evaluated the effects of alcohol consumption on Metabolic syndrome. The aim of this study is to analyze the relationship of alcohol dependence to Metabolic Syndrome and its correlates.

Methods: This is a cross-sectional study of 120 patients with alcohol dependent syndrome. Diagnosis of metabolic syndrome was based on International Diabetes Federation Global Consensus Definition.

Results: Out of the 120 patients included in the study Metabolic syndrome is present in 40 cases.

Conclusion: There is paucity of studies in Indian population on the relationship of metabolic syndrome and alcohol consumption. Further research in India is warranted using prospective design and larger sample.

Introduction

Previously known as X-syndrome or insulin resistance syndrome¹, Metabolic syndrome includes a cluster of changes in insulin resistance, abdominal obesity, elevated blood pressure, dyslipidemia.² The clustering of these features has been observed to increase the risk of cardiovascular disease³ as each component is associated with the disease.

The syndrome identifies individuals at an elevated risk for atherosclerotic cardiovascular disease, predisposes to type 2 diabetes mellitus, cancers, myocardial infarction, and stroke, also insulin resistance and the Metabolic syndrome are associated with a variety of other conditions; some of these are fatty liver, polycystic ovary syndrome, cholesterol gallstones, sleep apnea, lip dystrophies, and protease-inhibitor therapy for HIV.⁴ In many women features of the Metabolic syndrome (abdominal adiposity, insulin resistance, and dyslipidemia) emerge with estrogen deficiency.

The degree of the elevated risk can vary according to which components of the syndrome are

present and the other, non-metabolic syndrome risk factors in a particular person.

Though this condition is highly prevalent in developed countries its prevalence in developing countries is rising rapidly.⁵ The prevalence of Metabolic Syndrome differs among studies, but is generally in the range 8-24% in men and 7-46% in women.⁶ Recently, Metabolic syndrome has led to much curiosity in clinical and research fields.⁷

Studies have consistently shown that the mechanisms underlying the Metabolic Syndrome is the result of factors related to both lifestyle (e.g., smoking, physical activity, and diet) and heredity. The association of alcohol consumption with the Metabolic syndrome is complex, as both protective and deleterious effects have been reported. Light to moderate drinkers have a lower risk of these complications than abstainers and heavy drinkers. The cardio-protective benefits of alcohol are thought to be due to enhancement of insulin sensitivity, positive modulation of inflammatory activity and central obesity and elevation of HDL cholesterol.⁸ However, excessive consumption and binge drinking are associated

with higher incidence of Metabolic syndrome, adverse cardiovascular risk and type 2 diabetes.

Similarly, findings on the associations of alcohol consumption with cardiovascular outcomes are inconsistent. For example, a large population based study in the United States reported that mild to moderate consumption of alcohol was associated with a lower prevalence of the Metabolic syndrome, with a favorable influence on lipids, waist circumference, and fasting insulin in a comparison with current non-drinkers. In contrast, a large study in Korean adults suggested that there were adverse effects of alcohol consumption on all components of the metabolic syndrome⁹

Studies examining the contribution of alcohol consumption to Metabolic Syndrome have also reported conflicting results. Hence the need for systematic study to analyze the relationship of alcohol dependence to Metabolic Syndrome and its correlates.

Material and methods:

It is cross-sectional Study conducted in department of psychiatry, at a general hospital in rural setting in India.

Sample included all patients with alcohol dependence who have consented to participate in the study.

Socio-demographic data were collected at the first contact with the psychiatrist. Proforma was designed for the purpose of data Collection. It had all the details about socio-demographic characteristics, income details, recording anthropometry details and biochemical parameters, past medical history, smoking and alcohol status, and levels of physical activity

The diagnosis of alcohol dependence was based on ICD-10 criteria.

Anthropometry and blood pressure measurement such as Height, weight and waist

measurements were recorded. Waist circumference was measured in centimeters placing the tape on the navel after loosening the outer garments. The waist was defined as the smallest girth between the costal margin and iliac crests. Body mass index (BMI) (weight in kg/height in m²) was later calculated.

Blood pressure measurements were taken in resting state. Venous blood samples were collected after a minimum of 8 hours of overnight fasting. Fasting serum sample was used for estimation of lipids including total cholesterol, triglycerides and high density lipoprotein cholesterol.

Diagnosis of Metabolic syndrome was based on International Diabetes Federation Global Consensus Definition as the presence of central obesity (based on race and gender specific waist circumference) plus any two following components.

According to the criteria, the metabolic syndrome components include:

- 1) Central obesity given as waist circumference (>90 cm for men and >80 cm for women).
- 2) High concentrations of serum triglycerides (>150 mg/dL).
- 3) Low concentrations of serum HDL cholesterol (<40 mg/dL for men and <50 mg/dL for women).
- 4) Hypertension (systolic/ diastolic pressure >130/85 mmHg).
- 5) High concentrations of fasting glucose (>100 mg/dL).

Statistical Analysis:

Data was entered in MS excel and Detailed statistical analysis done using R software. For the continuous variables, data were presented as Mean and Standard deviation. Independent Student t test was used to compare the means between Metabolic Syndrome groups. For categorical variables, data were presented as counts and percentages, chi square test statistics was used to find out the association.

Results:

A total of 120 males were included in the study. 45% were smokers and 37.5% non-smokers. Age < 35yrs 40% and < 45yrs 40%, educated > 8th standard 39.1%, 83.3% were semi-skilled workers, 10.8% were unemployed, married 80%, 73.3% had no family history of diabetes mellitus, hypertension, cardiovascular diseases.

Majority of them did not have any psychiatric comorbidity (73.3%). The commonest psychiatric comorbidities were depression (n=8), anxiety disorders (n=8), delirium (n=8) and delusional disorder (n=4). 76% did not have physical comorbidity. Alcohol liver disease was present in 16 participants. 92% of the participants did not use psychotropic drugs other than the benzodiazepines.

Type of alcohol used whisky (40%), mixed (43.3%), rum (13.3%) and wine (3.3%).

The mean duration of dependence was 5.8yrs. The mean duration of alcohol use is 14.2yrs. Out of the 120 cases, 66 patients used alcohol only whereas 54 of them took both alcohol and tobacco.

Out of the 120 patients included in the study Metabolic syndrome is present in 40 cases. Subjects with Metabolic syndrome had higher mean age, systolic blood pressure, diastolic blood pressure, total triglycerides, fasting blood glucose, waist circumference, body mass index, and lower HDL.

Age was significantly correlated to the presence of Metabolic syndrome. In other words there are increased chances of Metabolic syndrome with increasing age. Other variables like duration of alcohol use (in yrs), duration of dependence pattern (in yrs), systolic blood pressure, diastolic blood pressure, total triglycerides, fasting blood glucose, waist circumference, body mass index were significantly correlated to the presence of Metabolic syndrome.

Table 1: Age group and Metabolic Syndrome

Age	METABOLIC SYNDROME				Total	
	NO		YES			
	Count	%	Count	%	Count	%
25 – 35	43	53.8	5	12.5	48	40.0
35 – 45	29	36.3	19	47.5	48	40.0
45 – 55	8	10.0	14	35.0	22	18.3
55 – 60	0	0.0	2	5.0	2	1.7
Total	80	100.0	40	100.0	120	100.0

Table 2: Education and Metabolic Syndrome

EDUCATION	METABOLIC SYNDROME				Total	
	NO		YES			
	Count	%	Count	%	Count	%
Illiterate	20	25.0	9	22.5	29	24.2
1 - 7 Standard	28	35.0	16	40.0	44	36.7
8 - 12 Standard	32	40.0	11	27.5	43	35.8
Graduate	0	0.0	4	10.0	4	3.3
Total	80	100.0	40	100.0	120	100.0

Table 3: Occupation and Metabolic Syndrome

OCCUPATION	METABOLIC SYNDROME				Total	
	NO		YES			
	Count	%	Count	%	Count	%
Unemployed	4	5.0	9	22.5	13	10.8
Semi Skilled	73	91.3	27	67.5	100	83.3
Skilled	3	3.8	4	10.0	7	5.8
Total	80	100.0	40	100.0	120	100.0

p = 0.004

Table 4: Marital Status and Metabolic Syndrome

MARITAL	METABOLIC SYNDROME	Total

STATUS	NO		YES			
	Count	%	Count	%	Count	%
Married	60	75.0	36	90.0	96	80.0
UnMarried	20	25.0	4	10.0	24	20.0
Total	80	100.0	40	100.0	120	100.0

p = 0.057

Table 5: Cigarette Smoking Status and Metabolic Syndrome

CIGARETTE SMOKING NON/EX/CURRENT SMOKER	METABOLIC SYNDROME				Total	
	NO		YES			
	Count	%	Count	%	Count	%
Current	36	45.0	18	45.0	54	45.0
Ex Smoker	8	10.0	13	32.5	21	17.5
Non	36	45.0	9	22.5	45	37.5
Total	80	100.0	40	100.0	120	100.0

Table 6: Comparison of Mean of various parameters

	METABOLIC SYNDROME				t	df	p value
	YES (n = 40)		NO (n = 80)				
	Mean	S D	Mean	S D			
DURATION OF ALCOHOL USE in years	16.9	6.89	12.8	6.20	3.29	118	0.001
DURATION OF DEPENDENCE PATTERN (IN YEARS)	9.0	5.04	4.2	3.14	6.47	118	0.000
SBP	134.2	13.69	117.5	11.85	6.90	118	0.000
DBP	84.1	11.52	79.2	9.12	2.54	118	0.013
HDL mg/dl	38.2	8.90	56.7	21.12	-5.29	118	0.000
LDL mg/dl	113.8	34.80	87.9	25.48	4.63	118	0.000
TRI GLYCERIDES	291.6	146.04	113.0	58.45	9.55	118	0.000

mg/dl							
TOTAL CHOLESTEROL mg/dl	249.9	38.95	161.4	45.63	10.50	118	0.000
FASTING BLOOD GLUCOSE mg/dl	142.5	34.52	107.7	88.89	2.38	118	0.019
WAIST CIRCUM FERENCE IN CMS	96.9	7.37	76.0	6.96	15.21	118	0.000
TOTAL BILIRUBIN mg/dl	2.3	2.60	1.0	0.41	4.22	118	0.000
DIRECT BILIRUBIN mg/dl	1.6	2.01	0.4	0.31	5.18	118	0.000
IN DIRECT BILIRUBIN mg/dl	0.7	0.57	0.7	0.38	0.34	118	0.731
SGOT IU/L	133.9	74.47	118.7	221.96	0.42	118	0.675
SGPT IU/L	96.5	62.77	63.8	54.14	2.96	118	0.004
WEIGHT IN KGS	72.3	12.41	55.1	7.73	9.34	118	0.000
HEIGHT IN MTS	1.7	0.11	1.6	0.06	1.97	118	0.051
BMI (KGS/M2)	25.6	3.40	20.2	2.62	9.56	118	0.000

Discussion:

This is across- sectional descriptive study of the relationship of Metabolic syndrome in Alcohol dependent patients. In various studies the prevalence of Metabolic syndrome varied from 5-31%^{10,11,12}. Prevalence of Metabolic syndrome is 33.3%. The higher prevalence of Metabolic syndrome can be attributed to the lower cut- off of the waist circumference using the International Diabetes Federation Global Consensus Definition as compared to other criteria.

Studies have reported an increased prevalence of Metabolic syndrome in those consuming >40 g/day of alcohol¹³. In our study in patients having Metabolic syndrome 90% of them consumed >4 drinks /day. In

particular heavy drinking was strongly associated with Metabolic syndrome.

In our subjects all the 5 components of MS (waist circumference, Triglycerides levels, HDL, elevated blood pressure, fasting glucose) significantly differentiated those with Metabolic syndrome from those without. This is inconsistent with another study done in India with alcohol and opioid-dependent subjects where 4 out of 5 components of Metabolic Syndrome (waist circumference, Triglycerides levels, HDL, elevated blood pressure, significantly differentiated those with Metabolic Syndrome from those without.¹⁴

Limitations and Conclusion:

Our study had the following limitations. Sample size was small, study comprised of males only, no control group, results cannot be generalized to the community as the study was conducted in a tertiary hospital. Despite the limitations there is paucity of studies in Indian population on the relationship of Metabolic syndrome and alcohol consumption. Further research in India is warranted using prospective design and larger sample.

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