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Original Article

Metabolic syndrome in drug naïve patients with substance use disorder

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ABSTRACT

Introduction and objective of the study: Metabolic syndrome is a combination of insulin resistance, impaired glucose regulation, dyslipidemia, hypertension, microalbuminuria and obesity and this increases the risk for diabetes, myocardial infarction and thus increases the risk of mortality. Substance dependence is considered as a prominent risk factor for metabolic syndrome, but not much work has been done in this field. Thus this study is aimed to know the prevalence of metabolic syndrome in drug naïve substance users.

Materials and methods: A total of 50 consecutive indoor drug naive patients with substance dependence (as per ICD 10) were included. Metabolic syndrome was assessed as per WHO criteria for metabolic syndrome. Statistical analysis was done using SPSS version 17.0 software and Chi square test was applied.

Results: Of the 50 subjects (46% used alcohol; 26% used opioid and 28% were multiple substance users), a total of 20% of the subjects met the WHO criteria for metabolic syndrome and all of them were only alcoholics. Commonest abnormalities were low HDL (48%), raised SBP/DBP (26%/22%) and TG's (18%). Age, weight, height, DBP and BMI were significant predictors of metabolic syndrome.

Conclusion: Metabolic syndrome is a common entity seen in patients with substance abuse, especially in patients with alcohol use disorder, as seen in our study.

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1. Introduction

Metabolic Syndrome (MS) is a combination of various clinical abnormalities ranging from insulin resistance, impaired glucose regulation, dyslipidaemia's, hypertension, microalbuminuria and obesit [1,2]. It contributes to an increased risk of diabetes and myocardial infarction [3,4]. Metabolic syndrome is a prominent cause of increased mortality amongst substance abusers [5,6]. The increased risk of metabolic syndrome is due to the nutritional deficiencies, cell damage, decreased energy production and lower antioxidant potential of cell [7]. High body mass index has also been said to cause metabolic syndrome [8].

World Health Organization criteria for metabolic syndrome [9] include insulin resistance and/or impaired fasting glucose and/or impaired glucose tolerance and two ormore of the following:

- Increase in waist circumference (≥80 cm for females and ≥90 cm for males of Asian origin)
- Two of the following:
  - ◯ Systolic BP ≥130 mm of Hg and/or diastolic BP ≥85 mm of Hg (or on treatment for hypertension)
- TG levels ≥150 mg/dl (or on specific treatment for this abnormality)
- HDL levels ≤40 mg/dl for males and ≤50 mg/dl for females (or on specific treatment for this abnormality)
- FBS ≥100 mg/dl (or on specific treatment for diabetes mellitus)

Many epidemiologic studies have reported a J-shaped or U-shaped curve formation about the relation between alcohol consumption and cardiovascular disease risk [10]. Substance use particularly that of alcohol and tobacco is associated with higher risk of developing diabetes, cardiovascular anomalies and in development of metabolic syndrome. Thus, these cause an increased risk for cardiovascular diseases and increase risk of mortality [11,12]. The relation between alcohol use and MS is very

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complex. Alcohol is detrimental towards plasma triglycerides (TG) levels whereas favourable towards plasma high density lipoprotein (HDL) levels and insulin sensitivity. And it may add to the increase in blood pressure [13–16]. The risk of MS in patients of low to moderate alcohol use is found to be lesser as compared to that of high alcohol users [12,17–22]. Whereas, the relationship between obesity and alcohol use is reportedly inconsistent [23]. MS is prevalent in the range of 5–31% amongst the substance dependent population [18–22].

This higher prevalence in the developing countries is owing to the urban lifestyle and factors such as increase in middle class population, digitalisation dietary changes and sedentary habits.

2. Aims & objective

To study the prevalence of metabolic syndrome in patients of substance dependence.

3. Materials and methodology

The study was done at a teaching medical college (M.M. Institute of Medical Sciences & Research, Mullana). The study was approved by the institutional ethical committee. Patients attending psychiatry department diagnosed as substance use disorder were screened for the following inclusion and exclusion criteria's by MS – the principal investigator or MB – the co-investigator.

Inclusion criteria:

- Patients in the age group of 25–80 years (Both males and females).
- Patients with a diagnosis of Mental and behavioural disorder due to psychoactive substance use (F10–F19) according to International classification of diseases – 10 (ICD-10).
- Patients who gave written informed consent.
- Drug naive patients (i.e. patients who never received any psychotropic agents continuously for more than two weeks and not so in last three months; ascertained by information obtained from patients and the caregiver and wherever available, the review of treatment records).

Exclusion criteria:

- Patients with a co-morbid psychiatric illness (except substance use disorder).
- Patients with a co-morbid mental retardation.
- Patients with a co-morbid physical illness that can influence the metabolic profile (including diabetes mellitus).

3.1. Anthropometric assessment

Weight (in Kg); height (in cm) and waist circumference (in cm) were measured. Waist circumference was measured in standing position, at the end of normal expiration; it was taken midway between inferior coastal margin and the iliac crest superior border.

3.2. Blood pressure assessment

Blood pressure (in mm of Hg) was recorded using a standard sphygmomanometer in supine position with minimum of two readings at five-minute interval. In case the BP reading was more than 140/90 mm of Hg, then an another reading was taken after 30 min. Out of these three lowest two were considered.

Anthropometric assessment, blood pressure monitoring and intravenous sample collection for metabolic assessment was done by SA – the co-investigator.

3.3. Metabolic assessment

Overnight fasting venous blood sample was collected under aseptic conditions to measure the fasting blood sugar (FBS), triglycerides (TG), high density lipoprotein (HDL), low density lipoprotein (LDL), Cholesterol and very low density lipoprotein (VLDL). Metabolic syndrome was diagnosed by using the International Diabetes Federation (IDF) criteria [9]. An intravenous sample of 10 ml was drawn under aseptic conditions it the indoor ward.

3.4. Sampling

A total of 50 consecutive indoor patients with substance dependence patients that fulfilled the inclusion and exclusion criteria were included in the study sample.

It was an observational, cross-sectional study and a written informed consent was obtained prior to being included in the study.

3.5. Statistical analysis

The data was analysed using the SPSS version 17.0 software. The frequency with percentage, mean and standard deviation were calculated. Pearson Chi-Square was used to calculate the *p*-value and the level of significance. A value $\leq$0.005 was considered statistically significant.

4. Results

Table 1 shows that all the subjects were males. A total of 65.2% of alcohol user's; 69.2% of opioid user's and 68% of multiple drug abusers hailed from rural area. Most of alcohol and opioid users

Table 1
Socio-demographic profile of the sample.

		Alcohol		Opioid		Multiple		Total		Pearson Chi-Square	p-Value
Sex	Male	23	100.0%	13	100.0%	14	100.0%	50	100.0%	–	–
Locality	Rural	15	65.2%	9	69.2%	10	71.4%	34	68.0%	0.167	0.920
	Urban	8	34.8%	4	30.8%	4	28.6%	16	32.0%		
Occupation	Unskilled	16	69.6%	9	69.2%	3	21.4%	28	56.0%	9.432	**0.009**
	Skilled	7	30.4%	4	30.8%	11	78.6%	22	44.0%		
Education	Below fifth	11	55.0%	9	45.0%	0	.0%	20	40.0%	14.548	0.001
	Above fifth	12	40.0%	4	13.3%	14	46.7%	30	60.0%		
Marital Status	Married	16	69.6%	9	69.2%	7	50.0%	32	64.0%	1.655	0.437
	Single	7	30.4%	4	30.8%	7	50.0%	18	36.0%		
Religion	Hindu	15	51.7%	4	13.8%	10	34.5%	29	58.0%	5.485	0.064
	Non hindu	8	38.1%	9	42.9%	4	19.0%	21	42.0%		

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