



Association between Metabolic Syndrome, Central Obesity and Depression: A Cross-Sectional Study at Tertiary Care Hospital Katihar, BIHAR

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Abstract

Introduction: *The current epidemiological data and meta-analyses indicate a bidirectional association between depression and metabolic syndrome (MetS).*

Aims: *To assess the prevalence of metabolic syndrome and obesity in drug naïve patients (in current episode) having Recurrent Major Depressive Disorder and Bipolar Depression.*

Method: *This was a single point cross sectional observational study that involved administration of diagnostic and assessment tools and blood investigations. Recruitment for the study was done from a period of august 2017 to July 2018.*

Results: *The prevalence of MetS was significantly more in the depression group when compared to healthy controls. The Bipolar depression group had 24% prevalence and recurrent depression group had 26% prevalence as opposed to none in the control group. The prevalence of MetS did not differ significantly amongst the both depression groups. Presence of central obesity was significantly more in the recurrent depression (30%) and Bipolar depression (24%) as compared to controls (8%). There was no statistically significant difference between the two depression subgroups.*

Conclusions: *This study demonstrated significantly more incidence of metabolic syndrome and central obesity in patients of depression than age and sex matched controls.*

Keywords: *Central obesity, depression, metabolic syndrome, obesity.*

Introduction

- Metabolic syndrome (MetS) is defined by a combination of abdominal obesity (also known as central obesity), high blood pressure, low high-density lipoprotein cholesterol (HDL-C), elevated triglycerides, and hyperglycemia.
- MetS is a set of metabolic, anthropometric, and hemodynamic abnormalities including abdominal obesity, impaired lipid profile (lowered high density lipoprotein [HDL] and

elevated triglycerides), hypertension and impaired fasting glucose or insulin resistance.^[1]

- The current epidemiological data and meta-analyses indicate a bidirectional association between depression and MetS.^[2] It should also be noticed that a majority of the studies in this area focus on MetS as a whole, using a dichotomous outcome variable,^[3] which strongly varies among different treatment centers and settings.

- It has also been found that the severity of depression is positively associated with the metabolic outcomes in outpatients and also the use of Anti-depressant medications.^[3,4] At the same time, multiple studies have shown poorer outcomes in depressive illnesses in patients with concomitant MetS or obesity.^[5,6,7]
- The most consistent evidence exists between depression and obesity-related components (abdominal obesity, low HDL-C, hypertriglyceridemia), whereas associations with hyperglycemia and hypertension are confirmed less frequently.^[8]
- Three longitudinal studies among depressed patients found that a combination of multiple metabolic dysregulations contributes to the sustained chronicity of depression.^[9,10] Once both are present, MetS abnormalities may contribute to patients maintaining a depressed state.
- In the approximately 3000 subjects in the Netherlands Study of Depression and Anxiety conducted among psychiatric patients, we confirmed an association between major depression and MetS and showed evidence for a dose-response association between the two.^[11]
- To the best of our knowledge, however, we could not find a study where MetS or its parameters were compared among the two major diagnoses of depression, namely the recurrent and the bipolar depression along with healthy controls.

Aims & Objective

To assess the prevalence of metabolic syndrome and obesity in drug naïve patients (in current episode) having Recurrent Major Depressive Disorder and Bipolar Depression.

Study Details

Site: This study was conducted in Department of psychiatry at KMCH, Katihar, BIHAR.

- The study comprised three groups, two groups comprised of age and sex matched patients of

bipolar depression and recurrent depression. The third group comprised of age and sex matched healthy controls.

-The subjects were evaluated for the MetS based on the National Cholesterol Education Program Adult Treatment Panel III (NCEP/ATP III)^[12] criteria.

Inclusion Criteria

- Men and women aged between 18 and 50 years
- Provided written informed consent
- A drug-free period of 3 months to return to premedication levels.

Exclusion Criteria

- Patients above 50 years of age to exclude the effects of age on the metabolic parameters (such as blood glucose, lipid profile, and blood pressure)
- Pregnant or currently lactating women
- Patients with co-morbid physical illnesses (such as coronary artery disease, hypothyroidism, liver or kidney disorders) or receiving medications (including contraceptive pills) that may alter the MetS parameters
- Patients with any other co-morbid axis-I disorder.

Methodology

This was a single-point cross-sectional observational study that involved administration of diagnostic and assessment tools and blood investigations. Recruitment for the study was done from August 2017 to Jul 2018 from the adult opdpsychiatry at Katihar Medical College & hospital, katihar [BIHAR].

The study comprised three groups, two groups comprised of age and sex matched patients of bipolar depression and recurrent depression. The third group comprised of age and sex matched healthy controls. The subjects were evaluated for the MetS based on the National Cholesterol Education Program Adult Treatment Panel III (NCEP/ATP III)^[12] criteria.

- Evaluation for psychiatric and physical disorders
- The diagnosis of depression was made as per the criteria of Diagnostic and Statistical Manual of Mental Disorders 5TH Edition, (DSM-V).^[13]
 - The included participants were rated on the 17-item Hamilton Depression Rating Scale (HAM-D)^[14] and Clinical Global Impression Scale^[15] (only Severity scale was used as it was a single point study)
 - The Global Assessment of Functioning Scale^[16] was used to assess the participants' psychological, social, and occupational functioning.

-Blood pressure was measured using a mercury sphygmomanometer in a well-rested subject in the left arm in the sitting position at two occasions.

-The body measurements for height, waist and hip circumference, weight and body mass index were done by the investigator (AB) using standard procedures.

-The diagnostic criteria that were used for the MetS were the updated NCEP ATP III criteria,^[17] which include cut-offs for waist circumference (males ≥ 90 cm, females ≥ 80 cm), fasting blood glucose (≥ 100 mg/dl), triglycerides (≥ 150 mg/dl), blood pressure ($\geq 135/\geq 80$ mm Hg), and low HDL (males < 40 mg/dl and females < 50 mg/dl).

Results

Crude demographic and clinical variables of the three groups are shown in Table 1. No statistically significant difference exists between the groups. Majority of the patients were males, between ages 31 and 40 years, married, and from rural background and lower socioeconomic class.

Table 1: Sociodemographic details of the sample

Variables	Recurrent major depressive disorder (A) (n=50) (%)	Bipolar depression (B) (n=50) (%)	Controls (C) (n=50)	df, χ^2 , P
Age (in years)				
18-20	7 (14)	8 (16)	8 (16)	6, 5.189,
21-30	12 (24)	12 (24)	20 (40)	0.52
31-40	16 (32)	18 (36)	14 (28)	
41-50	15 (30)	12 (24)	8 (16)	
Gender				
Male	23 (46)	30 (60)	27 (54)	2, 1.982,
Female	27 (54)	20 (40)	23 (46)	0.37
Marital status				
Married	39 (78)	37 (64)	33 (66)	2, 1.88,
Unmarried	11 (22)	13 (26)	17 (14)	0.39
Domicile				
Rural	32 (64)	28 (56)	23 (46)	2, 3.29,
Urban	18 (36)	22 (44)	27 (54)	0.19
Religion				
Hindu	39 (78)	30 (60)	35 (70)	2, 3.82,
Muslim	11 (22)	20 (40)	15 (30)	0.15
Socio-economic status (family income in rupees per month)				
<5000	28 (56)	29 (58)	19 (38)	4, 6.14,
5000-10,000	12 (24)	15 (30)	18 (36)	0.19
>10,000	10 (20)	6 (12)	13 (26)	

The presence of MetS is shown in Tabel 2. The prevalence of MetS was significantly more in the depression group when compared to healthy controls. The bipolar depression group had 24% prevalence and recurrent depression group had 26% prevalence as opposed to none in the control group. The prevalence of MetS did not differ significantly among both the depression groups.

Table 2- Presence of metabolic syndrome

Metabolic syndrome	Present (%)	Absent (%)	df, χ^2 , P
Recurrent depression	13 (26)	37 (74)	2, 15.072, <0.01
Bipolar depression	12 (24)	38 (76)	
Controls	0 (0)	50 (100)	

Presence of central obesity was significantly more in the recurrent depression (30%) and bipolar depression (24%) as compared to controls (8%). There was no statistically significant difference between the two depression subgroups. [tab.3]

Table 3: Presence of central obesity

Central obesity	Present (%)	Absent (%)	df, χ^2 , P
Recurrent depression	15 (30)	35 (70)	2, 7.89, 0.019
Bipolar depression	12 (24)	38 (76)	
Controls	4 (8)	46 (92)	

The waist circumference was also positively correlated with the severity of depressive symptoms as measured on the HAM-D scale ($r = 0.291$; $P = 0.003$).

Discussion

- In crude demographic and clinical variables of the three groups no statistically significant difference exists. Majority of the patients were males, between ages 31 and 40 years, married, and from rural background and lower socioeconomic class.
- The prevalence of MetS was significantly more in the depression group when compared to healthy controls.
- The bipolar depression group had 24% prevalence and recurrent depression group had 26% prevalence as opposed to none in the control group.
- The prevalence of MetS did not differ significantly among both the depression groups.
- Presence of central obesity was significantly more in the recurrent depression (30%) and bipolar depression (24%) as compared to controls (8%). There was no statistically significant difference between the two depression subgroups [Table 3].
- The waist circumference was also positively correlated with the severity of depressive symptoms as measured on the HAM-D scale ($r = 0.291$; $P = 0.003$).

Conclusion

In the current study, the overall prevalence of MetS was found to be 25% in the patients group (24% in recurrent depression and 26% in bipolar depression), which was significantly more than the healthy age- and sex-matched controls. Central obesity was also present in significantly higher proportion of the patient groups, and the waist circumference was found to be positively associated with the severity of depressive symptoms.

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Conflicts of interest- There are no conflicts of interest.

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