



PREVALENCE AND CLINICAL PROFILE OF METABOLIC SYNDROME IN HYPERTENSIVE SUBJECTS IN TERTIARY CARE HOSPITAL

General Medicine

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ABSTRACT

Background: Nationally comprehensive studies for the prevalence of the Metabolic syndrome is usually not available from the countries of South Asia. Current studies suggest that one-third of the urban population residing in major cities of India have Metabolic syndrome. In this study prevalence of metabolic syndrome in hypertensive patients and their clinical profile is studied.

Methodology: The present cross-sectional study was conducted on 100 non-pregnant hypertensive subjects of more than 18 years of age in tertiary care hospital between October 2016 to September 2018. 100 hypertensive subjects were evaluated according to International Diabetes Federation Criteria (IDF) for MS with waist circumference for South Asians ethnic group and prevalence of MS in these hypertensive subjects were observed.

Results: Total 100 non-pregnant hypertensive subjects out of which 57 were female and 43 were male. 46 patients diagnosed as MS. 49 patients were Diabetic or on treatment. 34 were overweight as per WHO classification of BMI and maximum subjects 50 were obese as per Asian classification of BMI. Out of 57 females 33 and out of 43 males 13 were having MS.

Conclusion: High prevalence of MS among hypertensive patients establishes MS has emerged as a significant health concern and indicates the need for metabolic screening and preventive measure in all hypertensive patients at the first diagnosis.

KEYWORDS

Metabolic Syndrome, Coronary Artery Disease, Congestive heart failure, Body mass index, Waist circumference

INTRODUCTION

Metabolic syndrome is a "constellation of numerous interrelated cardiometabolic risk factors that promote the development of atherosclerotic cardiovascular disease (CVD) and Type 2 diabetes mellitus (T2DM)".¹

According to IDF criteria^{2,3} central obesity (defined as waist circumference with ethnicity specific values) Increased waist circumference (males: ≥ 90 cm and for females: ≥ 80 cm)(South Indian Ethnicity)

plus any two of the following four factors is essential to be present, to label MS i.e.,

1. Hypertriglyceridemia ≥ 150 mg/dl (1.7 mmol/l),
2. Low HDL (males < 40 mg/dl (1 mmol/l) and for females < 50 mg/dl (1.3 mmol/l),
3. Elevated blood pressure (systolic blood pressure ≥ 130 mmHg and/or diastolic blood pressure ≥ 85 mmHg or drug treatment for hypertension), and
4. Elevated blood sugar (fasting blood sugar ≥ 100 mg/dl (5.6 mmol/l) or drug treatment for diabetes mellitus).

The key factors associated with rapid socioeconomic transitions and nutritional and lifestyle changes are as a result of increasing mechanization, urbanization, affluence, and rural-to-urban migration.^{4,5} Hypertension is an independent as well as one of the components of MS is the most common modifiable risk factor for CAD, CHF, peripheral vascular disease, end-stage renal disease, and stroke. An elevated arterial pressure (Hypertension) is an imperative public health concern in developed countries, as well as in India.^{6,7}

MATERIALS AND METHODS

The present cross-sectional study was conducted 100 nonpregnant hypertensive patients in Dr. D.Y. Patil Medical College, Hospital and Research centre, October 2016 to September 2018. According to WHO STEPS manual Anthropometric data (waist circumference, height and weight) were collected. Blood pressure was measured using a standard adult arm cuff of sphygmomanometer after 10 min rest. From each patient, venous blood was collected and serum was extracted and sent

for investigations. Subjects were categorized as MS according to IDF criteria with waist circumference for South Asian ethnicity.

RESULTS

Table 1: Age wise distribution of subjects

Age group	Frequency	Percent
35-50yrs	38	38.0
51-65 yrs	42	42.0
66-80yrs	20	20.0
Total	100	100.0

Maximum (42) were in age group of 51-65yrs

Table 2: Gender wise distribution of subjects

Gender	Frequency	Percent
Female	57	57.0
Male	43	43.0
Total	100	100.0

Female:Male ratio was 1.32:1, where 57% were female and 43% were male

Table 3: BMI wise distribution of subjects (WHO classification)

Category	Frequency	Percent
Normal	30	30.0
Overweight	34	34.0
Obese	36	36.0
Total	100	100.0

Table 4: BMI wise distribution of subjects (Asian classification)

Category	Frequency	Percent
Normal	16	16.0
Overweight	34	34.0
Obese	50	50.0
Total	100	100.0

Maximum subjects were obese (36) as per WHO classification of BMI and obese (50) according to Asian classification

Table 5: IDF Metabolic Syndrome Component among study subjects

Variable	Frequency	Percentage
Abdominal obesity -WC >90 cm for men and >80 cm for female	46	46.0
Blood pressure of >130/85 mmHg	100	100.0
Serum TG >150 mg/dL (1.7 mmol/L)	34	34.0
HDL-C <40 mg/dl in men (1.03 mmol/L) and <50 mg/dl (1.29mmol/L) in women	24	24.0
Fasting blood glucose level of >100 mg/dL	49	49.0

Maximum subjects (49) were diabetics apart from hypertension

Table 6: Metabolic Syndrome as per IDF criteria

Metabolic syndrome	Frequency	Percent
No	54	54.0
Yes	46	46.0
Total	100	100.0

Out of 100 hypertensive subjects 46 were diagnosed as Metabolic syndrome, 75 were on treatment for hypertension and 25 were newly diagnosed and or taking treatment previously. Out of 100 subjects 49 were known diabetic and/or on treatment.

Table 7: Metabolic syndrome criteria variable according to IDF among male and female

Variable	Male(43)	Female(57)	P value
Abdominal obesity -WC >90 cm for men and >80 cm for female	13(28.3%)	33(71.6%)	0.006
Blood pressure of >130/85 mmHg	43(43%)	57(57%)	
Serum TG >150 mg/dL (1.7 mmol/L)	13(38.2%)	21(61.8%)	0.490
HDL-C <40 mg/dl in men (1.03 mmol/L) and <50 mg/dl (1.29mmol/L) in women	10(58.3%)	14(41.7%)	0.880
Fasting blood glucose level of >100 mg/dL	20(40.9%)	29(59.1%)	0.665

Among components of IDF criteria to define metabolic syndrome there was no significant difference ($p>0.05$) for all component except abdominal girth ($p<0.05$) among male and female.

Table 8: Anthropometric and blood pressure variation as per metabolic syndrome

Variable	Metabolic Syndrome		P value
	Present (46)	Absent(54)	
Age	57.83±8.04	53.33±11.72	0.030
Wt (kg)	82.89±9.8	68.17±10.8	0.001
Ht(m)	1.64±0.06	1.64±0.06	0.967
BMI(kg/m ²)	30.7±2.6	25.3±3.7	0.001
WC (CM)	89.83±6.5	80.3±7.04	0.001
SBP	142.96±14.36	143.67±11.71	0.786
DBP	89.65±6.6	90.09±5.53	0.719

There was significant difference in mean value of age, weight, BMI and waist circumference for presence and absence of metabolic syndrome ($p<0.05$)

There was no significant variation in gender distribution for presence of metabolic syndrome ($p>0.05$). There was significant difference in mean value of weight, height, BMI and waist circumference for male and female ($p<0.05$). There was no significant variation in mean sugar level and lipid profile among male and female ($p>0.05$). There was significant variation in mean sugar level and lipid profile with presence or absence of metabolic syndrome ($p<0.05$) except for Sr. HDL ($p>0.05$)

DISCUSSION

Present study was carried out among 100 hypertensive subjects in a tertiary care hospital to find out prevalence of MS in these patients as per IDF criteria. In our study, 46% of patients had MS according to IDF criteria. Prevalence was more among male compared to female. Findings of our study revealed the impact of diet, lifestyle, improvement in socioeconomic status, and urbanization of community which are modifiable risk factor for occurrence of MS. Being cross sectional observational nature of study we didn't observe the effect of modification in modifiable risk factors and reduction in any component or overall reduction in metabolic syndrome. Older age was

an independent risk factor associated with MS which is consistent with other studies.^{8,9,10,11} Seventy out of 100 of the subjects in our study had an increased BMI (≥ 25 kg/m²). It is also noteworthy that the MS group showed a significantly higher BMI and WC as compared to the hypertensive subjects without MS suggestive with $p<0.05$. Study by Salagre et al¹² found similar results. Findings of the study proved increased abdominal obesity leads to MS. In present study most common co-morbidity amongst the MS group was diabetes mellitus (49%). Reduced HDL was the least common lipid abnormality recorded among the hypertensive patients (27%), followed by increased triglycerides (33%), increased total cholesterol (41%), increased low-density lipoprotein (LDL; 85%). These results are somehow similar with the different studies from India and other parts of the world.^{8,9,10,14,15,16,17} Mean blood pressure in patients with MS has been documented to be higher; however, it was not always the case.^{8,14,18} Poor control of blood pressure has been established in hypertensive patients with the components of MS present. In our study mean blood pressure among MS was higher than non-MS but it was not statistically significant.

CONCLUSION

High prevalence of MS among hypertensive patients establishes MS has emerged as a significant health concern and indicates the need for metabolic screening and preventive measure in all hypertensive patients at the first diagnosis. The synergistic effect of hypertension and other components of MS calls for the need for screening for the MS in hypertensive patients at initial diagnosis. India has become the diabetes capital of the world and the rising risk of diabetes due to MS prompts the need for aggressive measures to curtail the occurrence of associated metabolic disturbances. An estimated 32 million people in India are suffering from diabetes, and the figure is expected to rise to 69.8 million by 2025.¹³

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