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Original Research Article

Prevalence of metabolic syndrome among adults in sub-district hospital Akhnoor: a cross sectional study

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ABSTRACT

Background: Metabolic syndrome (MetS) is an aggregation of conditions that together increase the risk of cardiovascular disease in individuals, which would not otherwise be recognized. World-wide, its prevalence has been documented as 11-41%. It has become a major public health challenge globally due to rapid urbanization, sedentary lifestyle, and surplus energy intake.
Methods: The present hospital-based-study was aimed at finding the prevalence of MetS in people attending OPD of medicine in sub-district hospital Akhnoor, Jammu: from November 2019 to April 2020. Study subjects included both males and females between the age group of 20-60 years attending the medicine OPD. Among the 400 participants, 185 were females and 215 were males. Patients were diagnosed as MetS according to national cholesterol education program adult treatment panel-III (ATP) criteria.
Results: About 41.25% of the participants were below 40 years and 58.75% of the participants were above 40 years of age. A very high prevalence of 68.75% MetS was reported among patients, hinting at the changing lifestyle of the people. People of older age and with general obesity are under increased MetS risk. Prevalence among males (67.44%) and females (70.27%) differed only slightly. But our present study tends to suggest an increased risk among females, which is quite significant.
Conclusions: Various researchers have associated MetS with depression and chronic diseases, which shows that the population is under graver risk with increased prevalence among masses. The prevalence in >40 years age group is showing rapid and alarming increase. Lifestyle modifications are crucial to the management of MetS.

Keywords: MetS, Hypertension, Diabetes mellitus

INTRODUCTION

MetS is a complex asymptomatic, pathophysiological state and is constellation of interconnected physiological, clinical, and metabolic abnormalities that directly increase the risk of cardiovascular disease and related mortality.[1] The most common bio-physiological abnormalities are: increased blood pressure, insulin resistance, visceral adiposity, and dyslipidemia. Metabolic syndrome is a major public health challenge globally due to rapid urbanization, sedentary lifestyle, and surplus energy intake.[2]

During the past several decades, the prevalence of metabolic syndrome has markedly increased worldwide.[3] It is estimated that 25% of the world population has metabolic syndrome. Although this estimate varies widely due to the age, ethnicity and gender of the population studied.[4] Behavioral and environmental changes, such as adoption of westernized diet and sedentary lifestyle following the socioeconomic rise, are

thought to be the main reasons for metabolic syndrome in developing countries.[5]

Currently there are many criteria for defining metabolic syndrome. Most accepted ones are international diabetes federation (IDF) criteria, world health organization (WHO) criteria European group for the study of insulin resistance (EGIR), American association of clinical endocrinologists (AACE), and NCETP:ATP-III criteria.

Aim of study was to find the prevalence of MetS in people attending OPD of medicine in sub-district hospital Akhnoor.

METHODS

A hospital-based study was conducted in sub district hospital Akhnoor, district Jammu, for a period of 6 months: from November 2019 to April 2020. Study subjects included both males and females between the age group of 20-60 years attending the medicine OPD. Among the 400 participants, 185 were females and 215 were males. Each subject was thoroughly interviewed and data was computed using a standardized questionnaire containing information on demographics, anthropometric profile, individual characteristics associated with major risk factor for CVD, past medical history and biochemical parameters. Hypertension was identified from self-reports or doctor's measurement on the baseline and follow up measures or attending questionnaires, meeting at-least one of three JNC8 criteria: systolic blood pressure >140 mmHg, Diastolic blood pressure >90 mmHg or use of antihypertensive medicines. Incident hypertension was defined as newly developed hypertension among those free of baseline hypertension. Prevalence of diabetes and hypertension was ascertained based on self-report of the physician's diagnosis and/use of prescription medications along with medical records. Written and informed consent was obtained from all participants before the conduct of the study. Approval from the institutional ethical committee was attained before conduction of the study. The data were summarized as frequencies and percentages.

Inclusion criteria

All patients who attended OPD were considered eligible for inclusion. Only age group between 20-60 years was considered. Patients of both genders were included. People with known/diagnosed for first time, with hypertension, diabetes mellitus, and dyslipidemia were included.

Exclusion criteria

People belonging to age group below 20 years or greater than 60 years were excluded. People with chronic renal hepatic, cardiac, gastrointestinal, skeletal, endocrine diseases (except diabetes), acute critical illness and pregnancy, were excluded. People on calcium or vitamin D supplementation were also excluded.

Biochemical analysis was conducted on peripheral blood samples 4 ml, collected from all the participants after an overnight fast of 12-14 hour. Serum was separated by centrifugation at 3000 rpm for 5 minutes. Blood glucose was estimated by hexokinase method on autoquant 200 excelsus.[6] Blood urea was estimated by enzymatic urease method and serum creatinine was estimated by Jaffes method.[7,8] Liver function tests like: HDL, LDL, VLDL and triglycerides were estimated by enzymatic method on autoquant 200 excelsus fully auto-analyzer.[9]

Patients were diagnosed as MetS according to NCEP ATP III criteria (Table 1). According to the NCEP ATP III criteria, the diagnosis of MetS was made when three or more of the following were present: waist circumference >102 cm in male and >88 cm in female, fasting blood glucose >110 mg/dl, systolic blood pressure >130 mmHg or diastolic blood pressure >85 mmHg, fasting triglyceride levels (TG)>150 mg/dl, high density lipoprotein cholesterol (HDL-C)<40 mg/dl in men and <50 mg/dl in women.

Table 1: Diagnostic criteria proposed for the clinical diagnosis of the MetS.

Clinical measures	ATPIII (2001)
Insulin resistance	None, but any 3 of the following 4 features
waist circumference (cm)	WC≥102 (men) or ≥88 (women)
Lipids (mg/dl)	TG≥150, HDL-C<40 (men) <50 (women)
Blood pressure (mmHg)	≥130/85
Glucose (mg/dl)	>110 (includes diabetes)

RESULTS

A total of 400 subjects, out of which 215 were males and 185 females, participated in the study (Table 2). Average age of the participants was 47.36 years. About 41.25% of the participants were below 40 years and 58.75% of the participants were above 40 years of age. Prevalence of MetS among females was: 135 out of 185 (i.e. 70.27%), while prevalence of MetS among males was less at 67.44%. Net prevalence stood at: 68.75% (Figure 1).

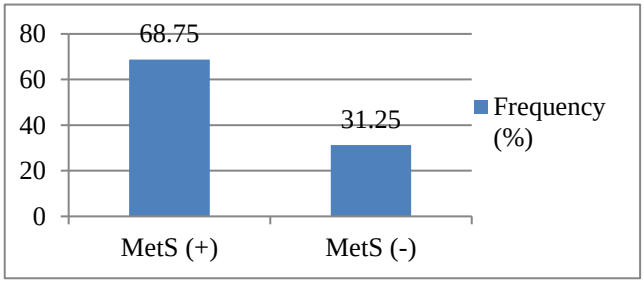

Figure 1: Net prevalence of MetS.

Table 2: Distribution of study population according to gender and age.

Variables	<40 years (%)	>40 years (%)	Total
Study population	165 (41.25)	235 (58.75)	400
Males	95 (44.19)	120 (55.81)	215
	57.58	51.06	53.75
Females	70 (37.84)	115 (62.16)	185
	42.42	48.94	46.25

MetS showed significant presence in people ageing >40 years, in both genders (Figure 2).

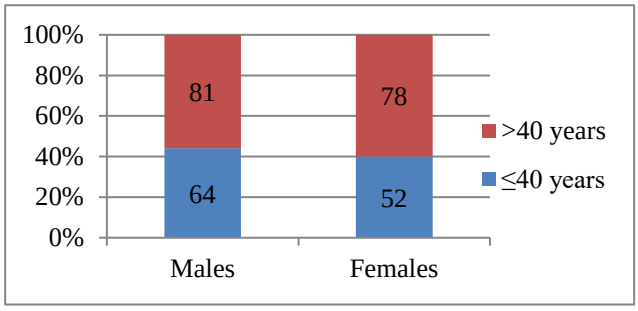

Figure 2: Patients with MetS according to age and gender.

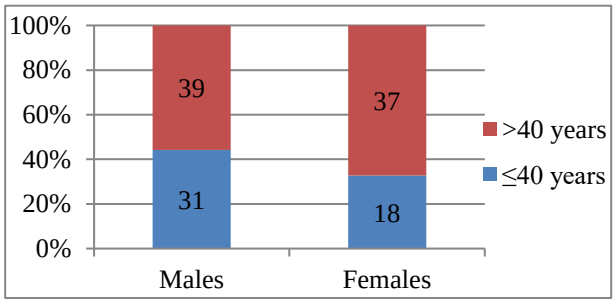

Figure 3: Patients without MetS according to age and gender.

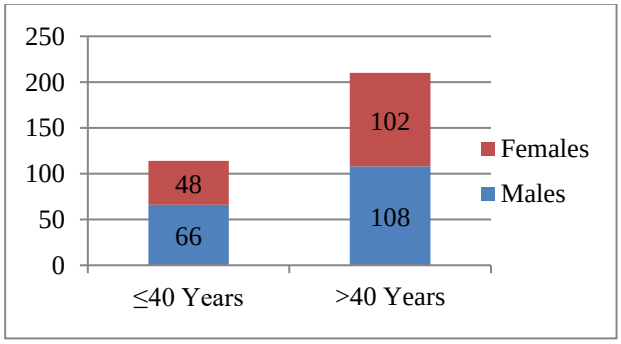

Figure 4: Prevalence of MetS according to age and gender.

In the age group of ≤40 years, male patients showed lower presence of MetS as compared to females (Figure 3). In the age group of ≥40 years, females showed declining health and increased MetS as compared to males (Figure 4).

DISCUSSION

This being a first kind of study conducted on the largely rural population of Jammu Region of Jammu and Kashmir UT, where people generally manage minor health problems without ever reporting before a doctor for advice. The given population is understood to follow such a lifestyle where males are basically the bread-earners and are quite actively involved in outdoor activities while females are confined to their homes. A very high prevalence MetS was reported in the population which clearly hints at the changing lifestyle of the people. People of older age and with general obesity significantly contribute to the increased MetS risk. This increasing trend is similar to the prevalence of MetS in urban and rural populations of India as a whole. [10]

Similar to NHANES II data, the prevalence among males (67.44%) and females (70.27%) differed slightly, but at the same time, our present study tends to suggest an increased risk among females, which in itself is quite significant and in relation to other studies conducted in India like that of Prasad et al.[11,12] Annani-Akollor et al in 2018 also showed increased prevalence of MetS among rural population in Ghana.[13] However various other researchers like Agarwal et al and Acharyya have associated MetS with depression and chronic diseases, which shows that the population is under graver risk with increased prevalence among masses.[14,15]

Although the prevalence of metabolic syndrome was found very high at 68.75% in the studied population, the prevalence was even significantly higher in females (70.27%). Although metabolic syndrome was more relevant in >40 years age group (64.81% or 210 of total 324 MetS cases), the prevalence in >40 years age group is showing an unexpected and rapid increase. Together the two findings do not augur well for the society and hint at the kind of health-related problems that at in store for us in future. With this, the role of primary-care physicians suddenly becomes highlighted. Physicians should be able to access patient's knowledge about the relationship of their lifestyle to their health in order to deliver a clear message about the importance of diet and exercise for them.

However, the present study being first of its kind, conducted in the rural belt of Jammu division in recent times, with the outcome (prevalence) showing increase among study subjects, is limited to patients attending sub district hospital Akhnoor, district Jammu. More such studies or studies involving healthy controls will be required to be undertaken, under more defined set of populaces, to conclusively establish this data and explore the associated problems as well.

CONCLUSION

The prevalence of MetS in >40 years age group, showing rapid and alarming increase, further advances our understanding of this subject, with the realization of gravity of the situation as well. Lifestyle modifications are thus crucial to the management of MetS. Programs should be launched to make public more aware and responsible about their health-status. Primary-care physicians should be now, guiding and helping patients, of all age groups, to adopt healthy lifestyle habits.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Nolan PB, Carrickranson G, Stinear JW, Reading SA, Dalleck LC. Prevalence of metabolic syndrome and metabolic syndrome components in young adults: A pooled analysis. Prev Med Rep. 2017;7:211-5.
2. Huang PL. A comprehensive definition for metabolic syndrome. Dis model Mech. 2009;2(5-6):231-7.
3. Borch-Johnsen K. The metabolic syndrome in a global perspective. The public health impact–secondary publication. Dan Med Bull. 2007;54:157-9.
4. Neill S, O Driscoll L. Metabolic syndrome a closer look at the growing epidemic and its associated pathologies. Obes Rev. 2015;16:1-12.
5. Kaur J. A comprehensive review on metabolic syndrome. Cardiol Res Pract. 2014;2014:1-21.
6. Basak A. Development of rapid and inexpensive plasma glucose estimation by two point kinetics method based on glucose-oxidase-peroidase enzymes. Indian J Clin Biochem. 2007;22(1):156-66.
7. Talke H, Schubert GE. Enymatische Harnstoff best immung in blut und serum in optichen test nach Warburg. klin wschr. 1965;41:174.
8. Knapp M, Mayne PD. Development of an automated kinetic jaffe method designed to minimize bilirubin interference in plasma creatinine assays. Clin Chim Acta. 1987;168:239-46.
9. National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III). Third Report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III) final report. 2002;106(25):3143-421.
10. Misra A, Khurana L. Obesity and the metabolic syndrome in developing countries. J Clin Endocrinol Metab. 2008;93(1):s9-30.
11. Park YW, Zhu S, Palaniappan L, Heshka S, Carnethon MR, Heymsfield SB. The metabolic syndrome: Prevalence and associated risk factor findings in the US population from the third national health and nutrition examination survey, 1988-1994. Arch Intern Med. 2003;163:36-42.
12. Prasad DS, Kabir Z, Dash AK, Das BC. Prevalence and risk factors for metabolic syndrome in Asian Indians: A community study from urban Eastern India. J Cardiovasc Dis Res. 2012;3:204-11.
13. Annani-Akollor ME, Laing EF, Osei H, Mehsah E. Prevalene of metabolic syndrome and the comparison of fasting plasma glucose and HbA1c as the glycemic criterion for MetS definition in non-diabetic population in Ghana. Diabetol Metab Sundr. 2019;11:26.
14. Agarwal A, Agarwal M. Metabolic Syndrome and central obesity in depression: A cross sectional study. Indian J Psychiatry. 2016;5821-6.
15. Acharyya A. Association of metabolic syndrome with chronic obstructive pulmonary disease in an Indian Population. Lung India. 2016;33:385-90.

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