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Original article

Metabolic syndrome and its components in postmenopausal women living in southern Italy, Apulia region

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ABSTRACT

Objectives: The goal of our study was to determine the prevalence of metabolic syndrome (MetS) and all its components, in a population of postmenopausal women aged over 45 years, consecutively accessed to our Heart Station, during 2014, for their first cardiac examination,furthermore to estimate their cardiovascular risk and the achievement of target blood values of main risk factors, according to current Guidelines.
Methods: We screened 1257 postmenopausal women. MetS was assessed according to the National-Cholesterol-Education-Program-Adult-Treatment-Panel III definition. Cardiovascular risk was calculated by the Systematic Coronary Risk Evaluation (<65 years).
Results: MetS was assessed on 834 women (66.4%). Prevalence of each component was: hypertension on 767 women (91.9%), central obesity 758 women (90.9%), low high-density lipoproteins cholesterol (HDLc) increased levels 612 women (73.3%), high triglyceride levels 428 women (51.3%), glucose levels higher than 110 mg/dl or diabetes 404 women (48.5%). Cardiovascular risk was moderate until 65 years, but it increases after. Metabolic control in postmenopausal women was poor for glucose, only 82 women (9.8%) presented glucose levels lower than 110 mg/dl, it was better for systolic blood pressure, that was normal in 564 women (67.6%) and worse for lipid levels.
Conclusion: The prevalence of metabolic syndrome in our population of postmenopausal women is high. Hypertension and central obesity are the more common components. The cardiovascular risk is moderate-high, the achievement of target values for glycemic and lipid levels is unsatisfactory, while systolic blood pressure is enough well controlled but however it is mandatory to improve this goal. An early MetS diagnosis and an early educational intervention are useful to decrease cardiovascular risk of postmenopausal women affected by metabolic syndrome.

1. Introduction

Metabolic syndrome [MetS] is a cluster of the most dangerous heart attack risk factors. They are: central obesity, hypertension, hyperglycemia or glucose intolerance, hypertriglyceridemia and low levels of high density lipoprotein cholesterol. According to National Cholesterol Education Program Adult Treatment Panel III (NCEP ATPIII), the presence of at least three of these criteria is diagnostic for MetS assessment [1]. The risk of acute cardiovascular diseases due to MetS seems to be particularly high in postmenopausal women [2]. Indeed, during post menopause there is a reduction of estrogen level that causes an increase in abdominal fat, resulting in obesity and other features of MetS [3–5]. The real impact of MetS on postmenopausal women, according to previous studies, in different populations, is unclear. [6–13]. The goal of our study was to determine the prevalence of MetS and all its components, in a population of postmenopausal women aged over 45 years, consecutively accessed to our Heart Station, during 2014, for their first cardiological examination, send by their general practitioners, evaluate their cardiovascular risk and the achievement of target blood values of main risk factors.

Abbreviations: MetS, metabolic syndrome; CVD, cardiovascular diseases; BMI, body mass index; WC, waist circumference; WTR, waist-to-thigh ratio; WHtR, waist-to-height ratio; SBP, systolic blood pressure; DBP, Diastolic blood pressure; TC, Total cholesterol; TG, Triglyceride; HDL-C, high density lipoprotein cholesterol; LDL-C, low density lipoprotein cholesterol; VLDLC, very low density lipoprotein cholesterol; HDL-C/TC, high density lipoprotein cholesterol-total cholesterol ratio; TG/HDL-C, triglyceride-high density lipoprotein cholesterol ratio.

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2. Materials and methods

2.1. Study population

Our cross-sectional study was conducted in Apulia region, Southern Italy, between January 2014 and January 2015. We screened 1257 postmenopausal women over 45aged. All participants gave informed consent to undertake analysis, and replied to a questionnaire concerning: demographic characteristics, menopause status, smoking status, physical activity, education, family history of medical diseases, residential area and drug history. Exclusion criteria were: the presence of chronic disease, such as heart failure, coronary artery diseases and cardiac valvular diseases. Postmenopause was defined as no menstrual period for at least 12 consecutive months.

We obtained consent to publish from the participant to report individual patient data.

2.2. Measurement of anthropometric variables

The height and weight of subjects were obtained, when wearing light clothing and without shoes. Waist circumference (WC) was also measured. Body mass index (BMI) was calculated as weight (kg) divided by the square of the height (m2).

2.3. Blood pressure measurement

Blood pressure was taken by trained personnel with participants in sitting position and having rested for at least 10 min using sphygmomanometer with appropriate cuff sizes and stethoscope in accordance with the recommendation of the American Heart Association [14]. Three consecutive measurement were performed on every patients, every two minutes intervals and the mean value was recorded to the nearest 2.0 mmHg. Systolic blood pressure (SBP) and diastolic blood pressure (DBP) were taken at the 1 st and 5th Korotkoff sounds respectively.

2.4. Definition of metabolic syndrome

MetS was diagnosed if three of the following factors were present, according to National Cholesterol Education Program Adult Treatment Panel III (NCEP ATPIII) criteria: [15] (a) Central obesity: WC >80 cm (b) High triglyceride: triglyceride >150 mg/dl (c) Low HDL-C: HDL-C <40 mg/dl. (d) Hypertension: SBP >130 mmHg and/or DBP >85 mmHg (e) Hyperglycaemia = fasting blood sugar ≥100 mg/dl, Impaired Fasting Glucose = fasting blood sugar between 100 e 124 mg/dl. Obesity a body mass index ≥30 kg/mq.

2.5. Blood sampling, processing and analyses

The levels of total cholesterol, triglyceride, high-density lipoprotein cholesterol (HDL-C) and fasting plasma glucose (FPG) were measured by standardized enzymatic technique. The current Guidelines standards of medical care in diabetes [16], hypertension [17] and dyslipidemia [18] were used to assess the achievement of target values. Low density lipoprotein cholesterol (LDL-C) was calculated using the Friedewald formula [19].

2.6. Cardiovascular risk

The cardiovascular risk was estimated using the Framingham Risk Score [20,21]. This score was developed to predict the absolute 10-year risk for fatal cardiovascular disease (CVD) based on sex, age, smoking status, total and HDL cholesterol levels, diabetes status, SBP and left ventricular hypertrophy presence.

2.7. Statistical analysis

Demographic characteristics were expressed using descriptive statistics. Results were expressed as mean and standard deviation (SD). All data were analyzed using SPSS (SPSS Inc., Chicago, IL; Version 19).

3. Results

We screened 1257 postmenopausal women aged over 45. MetS according to the above mentioned criteria was assessed on 834 women (66.4%). Prevalence of each component was: hypertension in 767 women (91.9%), central obesity in 758 women (90.9%), low levels of high-density lipoproteins cholesterol (HDLc) were in 612 women (73.3%), high triglyceride levels in 428 women(51.3%), glucose levels higher than 110 mg/dl or diabetes in 404 women (48.5%), (Fig. 1) none of them woman was currently smoking and none was engaged in regular physical activity. It is remarkable that only 67 women were normotensive (8,1%) and only 76 had a normal weight (9,1%). Cardiovascular risk was moderate until 65 years, but it increases after this age. Metabolic control in postmenopausal women was poor for glucose, only 82 women (9.8%) presented glucose levels lower than 100 mg/dl, it was better for systolic blood pressure, that was normal in 564 women (67.6%) and worse for lipid levels.

4. Discussion

MetS is a public health problem because leads CVD [22] We found that postmenopausal women affected by MetS have an increased aortic stiffness, an important marker of early atherosclerosis and high risk of CVD [23–25]. The differences in genetic profile, lifestyle factors such as diet and physical activity, age, menopausal status and gender contribute to the prevalence of MetS and its components. [26]. Our study assess the prevalence of MetS and its components among postmenopausal Apulian women at 66.4%. Our results need to be compared with studies carried out among Brazilian, Chinese, German and Korean women which estimated the prevalence of MetS, to range from 10.7% to 36.1% [27–31]. Piche and colleagues [32] found prevalence of 41.1% among Canadian postmenopausal women using the NCEP ATP III criteria. This observation is similar to studies carried out among premenopausal Korean and postmenopausal Ecuadorian women respectively which estimated the prevalence of MetS to range from 13.8% to 41.5% using the NCEP ATP III criteria [33,34]. Pandey and colleagues [35] found prevalence of MetS among Indian women to be 56% using NCEP ATP III criterion whereas 33.7% prevalence rate of MetS was observed by Ruan et al. [31] among Chinese women. We know that lifestyle and genetic characteristics of Apulian women are quite different than Chinese

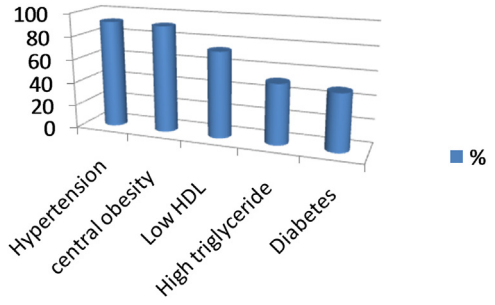

Fig. 1. Metabolic syndrome components in Apulian postmenopausal women aged over 45.

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