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Metabolic syndrome in women

Síndrome metabólico en la mujer

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INTRODUCTION

Metabolic syndrome (MS) comprises a set of risk factors for cardiovascular disease (CVRFs) and diabetes, such as abdominal obesity, atherogenic dyslipidemia, hypertension, and increased fasting glucose. The MS is associated with a five-fold increase in the prevalence of type 2 diabetes (DM2) and a two- to three-fold increase in that of CVD.[1]

Obesity, especially the abdominal type, is associated with resistance to the effect of insulin on peripheral glucose and fatty acid utilization, a fact that can lead to the development of MS and DM2. In addition, insulin resistance, hyperinsulinemia, associated hyperglycemia, and increased adipokines can yield vascular endothelial dysfunction, abnormal lipid profile, hypertension, and vascular inflammation. All these conditions promote the development of atherosclerotic CVD. This association has been named syndrome x, death quartet, or insulin resistance syndrome.[2]

MS increases with age and is influenced significantly by gender. In people under 50 years of age, it is slightly more prevalent in men, and this situation reverses after that age. The most frequent component of MS in Mexico is abdominal obesity (76.6%), followed by low levels (60.5%) of HDL cholesterol.

In a study by Quesada et al. in which 899 women were followed up for eight years, it was observed that 34.9% were overweight, 40.5% obese, and 42.4% had MS. It was documented a 38.5% obstructive coronary disease in women with suspicion of myocardial ischemia. MS was a predictor of all-cause mortality, while overweight and obesity were protective against death, with an association between MS and BMI with death ($p < 0.0001$) and worse survival in MS with normal BMI.[3] These data are consistent with the «obesity paradox» in mortality described in ischemic heart disease and emphasize the evaluation of MS independently of BMI.

Metabolic syndrome and gender differences

The differences in the prevalence of MS and its components are determined by the distribution and characteristics of adipose tissue. An analysis of the Third National Health and Nutrition Examination Survey (NHANES III, NCEP criteria) in the US showed that abdominal obesity was the predominant feature of MS in women. In addition, the most common group (16.7%) in younger women was increased triglycerides (TG) and low HDL cholesterol. For younger men, the combination of increased TG, low HDL cholesterol, and hypertension was the most common (18.0%). Notably, this cohort essentially eliminated the gender difference in subtype distribution in older adults (> 65 years). The most common subtype, the presence of all five features, was equally prevalent in older men and women.[4]

Another differentiating point is the frequency of impaired fasting glucose (IFG) and impaired glucose tolerance (IGT). Based on analyzes of the DECODE/DECODA (Diabetes Epidemiology: Collaborative Analysis of Diagnostic Criteria in Europe/Asia) study groups, which included data from 13 European and 10 Asian studies, IFG is more common in

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men than in women in almost all countries, being up to 7 to 8 times higher in men aged 50 to 70 years.

Other factors for the appearance of MS are the climacteric, the use of hormonal contraceptives, polycystic ovary syndrome, which affect insulin sensitivity, glucose, and lipid metabolism, as well as those of pregnancy (gestational diabetes and hypertensive disorders of pregnancy).

Menopause and metabolic syndrome

The results of several studies indicate that postmenopausal status is associated with an increased risk of MS, regardless of aging.

During post-menopause, hormonal changes can promote metabolic changes that increase body weight and abdominal adipose tissue. Hypoestrogenism, at this stage, is associated with metabolic and vascular alterations, endothelial dysfunction, and increased oxidative stress. In Mexico, derived from the CARMELA study, the prevalence of MS of 27.4% in women of reproductive age vs. 35.5% in postmenopausal women.[5]

It has been observed that the risk of CVD increases significantly after menopause, which may be a consequence of changes in sex hormones, cardio-metabolic parameters, and chronological aging. In turn, hypoestrogenism is directly related to an increase in total cholesterol (TC), LDL-C, and apolipoprotein B, as well as an increase in the ratio of TC/HDL-C, being associated with a more atherogenic lipid profile.

This estrogen deficiency, in turn, leads to an imbalance between the factors that affect vasodilation and vasoconstriction, resulting in increased vascular resistance and high blood pressure. Furthermore, in post-menopause, coagulation factors increase (VII, VIII, fibrinogen, and antithrombin). Also, plasminogen activator inhibitor type 1 (PAI-1), the principal deterrence of fibrinolysis, is elevated in postmenopausal women compared to premenopausal ones, determining a procoagulant state.[6]

Hormonal contraceptives

The administration of combined contraceptives has been associated with increased insulin resistance, glucose intolerance, and lipid metabolism. Thus, in women with obesity and or PCOS, the risk of metabolic alterations that lead to MS[7] increases.

POLYCYSTIC OVARY SYNDROME (PCOS)

This condition has been observed in a third of women with MS. Obesity and insulin resistance are two conditions common to PCOS and MS. Therefore, it is recommended to perform tests to detect early glucose intolerance and dyslipidemia in women with PCOS, including adolescent women.[8]

MANAGEMENT RECOMMENDATIONS

The management strategy should focus on preventive measures. Therefore, it is necessary to recommend modifying the lifestyle, increasing physical activity, eating a balanced diet, avoiding smoking, reducing the consumption of alcoholic beverages, and promoting intellectual activity. However, concomitant treatment may be necessary.[9]

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