Millán, S.; Samaniego-Sánchez, C.; Romero, A.; Quesada-Granados, J. J.; López-García de la Serrana, H.

METABOLIC SYNDROME AND NUTRITION IN A GRANADA’S TROPICAL COAST POPULATION

Nutrición Hospitalaria, vol. 28, núm. 4, julio-agosto, 2013, pp. 1190-1194

Grupo Aula Médica
Madrid, España

Available in: http://www.redalyc.org/articulo.oa?id=309227544032
Original / Síndrome metabólico

Metabolic syndrome and nutrition in a Granada’s tropical coast population


Abstract

Background: The metabolic syndrome (MS) is described as an association of health problems that a given person may simultaneously or successively develop, and it is considered a serious condition because it is related to a significantly increased risk of suffering diabetes, coronary disease and brain damage. Nutrition, along with other factors such as physical activity and genetic inheritance, has an influence on preventing MS.

Objective: The aim of this research is to demonstrate important aspects concerning the diagnosis, the prevalence, and the prevention of metabolic syndrome among the population of the tropical coast of Granada.

Methods: 119 individuals from the tropical coast of Granada were studied to collect personal data such as their body mass index, body fat percentage, glycaemia, total cholesterol, HDL cholesterol, LDL cholesterol, and food intake (through nutritional survey). Results: As a result of this research, a metabolic syndrome prevalence of 20.2% was obtained, 58.3% of which was related to women. The results obtained show significant statistical differences between individuals having metabolic syndrome and the control group. Particularly, these differences can be noted in parameters such as the BMI or the % of body fat. Nevertheless, there are no significant differences between the two groups concerning parameters related to nutrition such as % of fat, carbohydrates, proteins and kcal/day.

Conclusion: As a conclusion from the research, we can state that the metabolic syndrome prevalence among the population of the tropical coast of Granada is similar to the figure obtained for the population in the US and in other areas of Spain. In addition, this research shows that metabolic syndrome is more frequent among individuals whose BMI and % of body fat is higher than 30.

DOI:10.3305/nh.2013.28.4.6033

Key words: Metabolic syndrome. Diet. Obesity. Body Mass Index.

SÍNDROME METABÓLICO Y NUTRICIÓN EN UNA POBLACIÓN DE LA COSTA TROPICAL DE GRANADA

Resumen

Antecedentes: El síndrome metabólico (SM) es una asociación de problemas de salud que pueden aparecer de forma simultánea o secuencial en un mismo individuo, y es importante porque se relaciona con un incremento significativo de riesgo de diabetes, enfermedad coronaria y enfermedad cerebrovascular. La nutrición junto a otros factores como es el ejercicio físico y la genética del individuo, influyen en la prevención del SM.

Objetivo: Conocer aspectos importantes como el diagnóstico, prevalencia y prevención del síndrome metabólico en población de la Costa Tropical Granadina.

Métodos: Se estudiaron en 119 individuos de la Costa Granadina parámetros como el índice de masa corporal, el porcentaje de grasa corporal, análisis clínicos de glucosa, colesterol total, colesterol HDL, colesterol LDL y se estudiaron valores nutricionales mediante encuesta.

Resultados: En el estudio se obtuvo una prevalencia el Síndrome metabólico del 20,2%, del que el 58,3% correspondía a mujeres. Los resultados obtenidos reflejan diferencias estadísticas significativas entre los individuos con síndrome metabólico y el grupo control, observándose dichas diferencias en parámetros tales como el IMC o el % de grasa corporal. Sin embargo en parámetros como porcentaje de lípidos, porcentaje de hidratos de carbono, porcentaje de proteínas y kcal/día no hay diferencias significativas entre los individuos con SM y los individuos control.

Conclusión: De esta manera podemos deducir del estudio que la prevalencia de síndrome metabólico en la población de la Costa Tropical Granadina se asemeja a la obtenida en EE.UU y a la obtenida en algunas zonas estudiadas en España. Igualmente, se puede apreciar en este estudio como el síndrome metabólico es más frecuente en personas con IMC y % de grasa corporal superior a 30.

DOI:10.3305/nh.2013.28.4.6033

Palabras clave: Síndrome metabólico. Dieta. Obesidad. Índice de masa corporal.

Correspondence: José Javier Quesada Granados.
Department of Nutrition and Bromatology.
Faculty of Pharmacy. University of Granada.
18071 Granada. Spain.
E-mail: quesadag@ugr.es

Recibido: 8-VII-2012.
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Methods

The equipment used for the anthropometric measurements was: electronic scales model OMRN HN283, stadiometer BAME, fiberglass tape GULICK to measure waist circumference, caliper HOLTAIN. The BMI was calculated following the World Health Organization (WHO) criterion: BMI = Weight (kg)/Height (m). The percentage of body fat was calculated using the Siri Equation. Blood pressure was measured with a sphygmomanometer model OMRON wrist R6/HEM 6001-E.

The blood samples for the measurement of glucose, total cholesterol, LDL cholesterol, HDL cholesterol, and triglycerides were taken in fasting conditions between 8:30 and 9:30 in the morning. Venojet® tubes were used for the biochemical analysis, where 6 ml of blood with EDTA were introduced for the collect of blood serum or plasma. All the determinations were performed at 37º C by the biochemical analyser Technicon RA-1000. The reagents used were make QCA (Química Clínica Aplicada S.A.), and they were:

liquid glucose GOD-POD method for the measurement of glucose, liquid cholesterol colorimetric CHOD-PAP method for total cholesterol, direct HDL cholesterol calorimetric method for HDL cholesterol, and liquid triglycerides GPO method for triglycerides.

Statistical analysis

The statistical analysis was performed with Microsoft Excel 2000 and Statistical Analysis System, SAS® version 9.1 for Windows. The statistical techniques used were the Wilcoxon Test, descriptive analysis, and ANOVA.

Results

This research shows that 20.2% of the sample was diagnosed with MS. Significant statistical differences were found between the individuals with MS and the control group. When analyzing table I, it is possible to...
appreciate the figures for each parameter that was measured as well as its level of statistical significance.

According to the data, the prevalence of MS in the sample is 20.2%, 58.3% of which were women. Comparing our figure for prevalence (20.2%) with that of other researchers in the United States (22%) it is noticeable how similar they are. If also compared the sample of this research with the Spanish population as a whole (MESYAS) in terms of prevalence, it can be noticed that our figure is higher, but it has to be taken into consideration that the prevalence of MS in the Spanish population is not homogeneous, on the contrary the prevalence in the south of Spain is higher than in the north, in agreement with our results. In the developed countries there is an estimated prevalence of 24% in adults, whereas the figure exceeds 40% in the elderly.21

Obesity is a condition characterised by the excess of body fat. According to the quantity of body fat, a person could be defined as obese when his or her percentage of body fat exceeds the figures considered as normal: 12 to 20% in men and 20 to 30% in women.22

The BMI, in spite of not being an excellent indicator of adiposity in muscular or elderly people, is the parameter most used in the majority of epidemiologic studies and is the most recommended one by medical societies and international health organizations for medical use, due to its reproducibility, easy use, and capability to show the adiposity of the majority of the population.

When we talk about obesity in our research, it is referred to BMI and body fat percentage. In our study there are differences between the individuals with MS and the control ones (table II). The individuals with MS of our sample have an average BMI of 32.5 kg/m² (falling into the “Obese grade I” category according to the WHO) and an average body fat percentage of 34.8% (falling into the “Obese” category according to scientists and doctors).23

Diet is the main exogenetic factor that influences the concentration and composition of blood lipids. The total calorie content in the diet has an effect on the blood lipids. Diets with excess calories (hypercaloric) stimulate the production of triglycerides by the liver and increase the level of LDL cholesterol. When studying the diet13 of the individuals in our sample (data obtained through dietetic survey) no significant differences can appreciated in terms of percentage of lipids, carbohydrates and proteins, and kcal/day between the subjects with MS and the control ones (table III).

### Discussion

The prevalence of MS in the tropical coast of Granada is similar to that of other national (MESYAS) and international studies. This prevalence is high, but it is important to know that corrective and preventive measures can be taken involving diet and physical activity. The BMI and the body fat percentage are relevant factors to consider when talking about MS since significant differences have been found between individuals with and without MS. Regarding diet, our results (obtained through dietetic survey) don t agree with those of other studies related to MS, reaching the conclusion that this method may not be the most suitable to obtain this kind of information. More controled conditions should be applied to obtain the data related to the individuals food intake. We would suggest conducting the research among guests of some kind of canteen, where the menu is perfectly known. MS is related to variables, apart from diet, such as physical activity and genotype that were not taken into account in this research and therefore may have altered the results in one direction or the other.

### References


