ORIGINAL ARTICLE

Overweight, obesity and cardiometabolic risk in middle-aged women

Juan Antonio Suárez González[1]*, Mario Gutiérrez Machado[1]

[1]"Mariana Grajales" University Gynecological and Obstetric Provincial Hospital, Santa Clara, Villa Clara, Cuba.

***Juan Antonio Suárez González.** juansuarezg@infomed.sld.cu

Received: 03/11/2022 - Approved: 06/27/2022

ABSTRACT

Introduction: obesity is defined as the presence of an excessive quantity of corporal fat.
Objective: to characterize middle-aged women according to nutritional assessment and cardiometabolic risk factors.
Methods: descriptive, retrospective study in 180 middle-aged women from Santa Clara City from 2018 to 2021. Statistical analysis was performed in two stages: descriptive analysis (mean, median, and standard deviation) and inferential analysis (Chi-square [qualitative]).
Results: overweight and obesity predominate, 43.89% have a body mass index corresponding to the overweight category and when classifying obesity 31.67% have class I obesity. As the body mass index increases, the frequency of risk factors increases: hypertension, smoking and ischemic heart disease. All the patients with overweight and obesity had an abdominal waist greater than 88 centimeters.
Conclusions: Cardiometabolic risk markers were found in middle-aged women with overweight and obesity.
Key words: middle age; climacteric; cardiometabolic risk

RESUMEN

Introducción: la obesidad se define como la presencia de una cantidad excesiva de grasa corporal.
Objetivo: caracterizar mujeres de edad mediana según la evaluación nutricional y los factores de riesgo cardiometabólicos.
Métodos: estudio descriptivo, retrospectivo en 180 mujeres de edad mediana de la Ciudad de Santa Clara desde 2018 hasta 2021. El análisis estadístico se realizó en dos etapas: análisis descriptivo (media, mediana, y desviación estándar) y análisis inferencial (Chi cuadrado [cualitativos]).
Resultados: predomina el sobrepeso y la obesidad, el 43,89% tiene un índice de masa corporal correspondiente a la categoría sobrepeso y al clasificar la obesidad el 31,67% tiene una obesidad clase I. Según aumenta el índice de masa corporal aumenta la frecuencia de factores de riesgo: hipertensión, tabaquismo y cardiopatía isquémica. Todas las pacientes con sobrepeso y obesidad tienen una cintura abdominal mayor de 88 centímetros.
Conclusiones: se encontraron marcadores de riesgo cardiometabólicos en mujeres

de edad mediana con sobrepeso y obesidad.
Palabras clave: edad mediana; climaterio; riesgo cardiometabólico

INTRODUCTION

Obesity is defined as the presence of an excessive amount of body fat.[1,2,3,4] According to the World Health Organization (WHO) 75% of the female population over 30 years of age is overweight or obese globally.[5] Data from Cuba suggest that the prevalence of overweight and obesity is higher than in some European and Latin American countries.[6] According to a study by the National Institute of Hygiene, Epidemiology and Microbiology, 15.44% of the Cuban female population was obese and 31.5% were overweight.[7] Data collected by the III National Survey on risk factors and preventive activities for non-communicable diseases show that in 2010, 18.4% of females were obese and 29.9% were overweight.[8]

Obesity affects subjects of all ages and all sexes and has a high trend prevalence. Its frequency increases with age until around 60 years of age in both sexes and is consistently higher in women of all ages, regardless of socioeconomic status.[1] It is associated with a higher frequency of occurrence of chronic noncommunicable diseases such as arterial hypertension, diabetes mellitus, gallstones, elevated blood cholesterol and triglycerides, coronary heart disease, some types of cancer, and respiratory, psychiatric and osteoarticular diseases, which limit life expectancy, with a higher health cost for the population, representing a serious problem for global public health.[2]

It has been documented that the body mass index (BMI) increases with age[9] and that the stage of life in which women tend to gain more weight is from 40 to 50 years of age, which corresponds to the peri-menopausal stage, when, due to hormonal changes, they retain more water, accumulate more fat and become more sedentary.[10]

Waist circumference is also used as a marker of obesity. Women with waist circumference greater than 88 cm are considered to be at substantially increased metabolic risk.[5]

This study aims to characterize middle-aged women aged 45-59 years according to nutritional assessment and the presence of cardiometabolic risk factors (CMRF).

METHODS

A descriptive, retrospective study was carried out in the Municipality of Santa Clara, Villa Clara Province, in the period from January 2018 to December 2021. The sample was constituted by 180 women belonging to the municipality and who assisted to follow-up in their health area in the Consultation of climacteric and menopause. These women are included in a follow-up since ten years ago, when they started a pregnancy with risk of pre-eclampsia-eclampsia.

A simple random sampling was performed.

Inclusion criteria:

- Age between 45 and 59 years and willingness to participate in the study.
- Be included in the study conducted ten years ago when they began a pregnancy with risk factors for pre-eclampsia-eclampsia

Exclusion criteria: Patients who are not currently in the area and in whom it was not possible to perform the clinical study and the anthropometric and analytical assessments.
The patients were questioned and examined. The data collected were recorded in a data collection form.
The overweight and obesity indicators were obtained from the BMI and anthropometric measurements, using a weight with a measuring rod and tape measure. Hemochemistry studies were carried out in the polyclinics corresponding to the health areas of the municipality.
The descriptive and inferential statistical analysis was performed with the SPSS 20.0 statistical package and were represented in frequency tables. For each variable recorded, it was verified that there were no extreme, inconsistent or missing values.
The principle of confidentiality of the information in the database and in the medical records reviewed was respected. The research was approved by the Scientific Council and the Research Ethics Committee.

RESULTS

In Table 1, the nutritional evaluation of the patients investigated is shown. 43.89% have a body mass index corresponding to the overweight category and, when classifying obesity, 31.67% have class I obesity, 5% have class II obesity and 1.67% have morbid class III obesity.

Table 1. Distribution according to nutritional assessment

Nutritional assessment (IMC (kg/m^2))	No.	%
Underweight (< 18.6)	1	0.56
Normal weight (18.6 - 25.0)	31	17.22
Overweight (25.1 - 29.9)	79	43.89
Obese class I (30.0 – 34.9)	57	31.67
Obese class II (35.0 – 39.9)	9	5.00
Obese class III (≥ 40)	3	1.67
Total	**180**	**100.0**

There is a predominance of middle-aged women with overweight and obesity (148, 82%) in relation to women with normal weight and underweight (32, 18%).
The relationship of personal pathological history and nutritional assessment is described in Table 2. Hypertension, diabetes and dyslipidemia have a higher frequency in women with overweight and class I obesity, ischemic heart disease have a different behavior, although the frequency is too small to reach any conclusion, with only four cases distributed in three normal weight and one underweight.
The rest of the personal pathological antecedents in obese and overweight women predominate as nutritional status varies. This evidently has an impact on cardiometabolic risk due to the association of several risk factors.
Abdominal obesity is a real health problem and the calculated indicator of abdominal circumference greater than 88 cm as cardiometabolic risk in women was related to the nutritional evaluation in this sample. The five middle-aged

women who have an abdominal circumference less than 88 cm, without risk, are included in the evaluation of normopeso four and one is underweight; however, in patients with overweight and obesity all have an abdominal circumference greater than 88 cm, marker of abdominal obesity and cardiometabolic risk. All patients with overweight and obesity have an abdominal waist greater than 88 cm.

Table 2. Personal pathologic history in middle-aged women according to nutritional assessment

Personal pathologic history	Nutritional assessment											
	Underweight (n=1)		Normal weight (n=31)		Overweight (n=79)		Obesity class I (n=57)		Obesity class II (n=9)		Obesity class III (n=3)	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
High blood pressure[a] (n=91)	1	1.1	8	8.79	29	31.87	42	46.15	8	8.79	3	3.3
Diabetes[b] (n=64)	0	0.00	9	14.06	27	42.19	21	32.81	5	7.81	2	3.13
Dyslipidemia[c] (n=35)	0	0.00	6	17.14	15	42.86	10	28.57	3	8.57	1	2.86
Ischemic heart disease[d] (n=4)	1	25.0	3	75.0	0	0.00	0	0.00	0	0.00	0	0.00
Smoking[e] (n=95)	0	0.00	7	7.37	43	45.26	39	41.05	4	4.21	2	2.11

Percent of row based on n for each risk factor
[a] $x^2=35.056$ (px^2)=0.0001
[b] $x^2=4.072$ (px^2)=0.539
[c] $x^2=1.861$ (px^2)=0.868
[d] $x^2=5.5293$ (px^2)=0.0001
[e] $x^2=18.626$ (px^2)=0.002

DISCUSSION

Pregestational BMI is directly related to maternal and fetal health, independently of weight gain during pregnancy. The mean values of both variables in the patients studied were associated with cardiometabolic risk figures.[11,12,13]

Obesity is recognized as one of the major public health problems in the world. The WHO estimated that, worldwide, 52% of adults and 30% of children suffer from excess weight.[14,15] This disease is characterized by excessive body fat associated with the development of multiple metabolic disorders and these, in turn, cause other health problems.[16]

Measurement of abdominal circumference alone cannot determine whether the relationship with risk is associated with intra-abdominal adipose tissue, subcutaneous adipose tissue, or both. The mechanism is not yet well elucidated, but there are several hypotheses. One of the oldest involves intra-abdominal adipose tissue as a metabolic risk factor by stimulating the central nervous system-adrenal axis through environmental triggers, causing preferential deposition of adipose tissue in the trunk and the metabolic alterations associated with these deposits. More recently it was postulated that

subcutaneous fat can store a limited amount of energy and the excess would go to ectopic deposits in the liver and skeletal muscle. Excess of this ectopic accumulation would be the cause of metabolic disorders in these organs. Increased intrahepatic fat is strongly associated with dyslipidemia and hepatic insulin resistance, and increased intramyocellular fat is associated with skeletal muscle insulin resistance. These hypotheses are not mutually exclusive and it is possible that both pathways are involved in the association between abdominal fat and the occurrence of adverse metabolic consequences. Abdominal circumference constitutes a specific marker of body fat distribution that can identify patients with obesity-related increased CMR better than BMI determination, which does not provide information about regional fat distribution. This is an aspect of relevance because it has been established that the site of deposition and distribution of fat in the body represents a different risk because abdominal adipose tissue-specifically perivisceral adipose tissue (mesentery, omentum)-has the highest risk of cardiovascular disease, type 2 diabetes mellitus, and cancer, among other consequences. For a long time adipose tissue was considered a rather passive organ, with the sole function of storing energy in the form of triacylglycerides to be delivered in times of energy debt; but far from being a set of inert cells, it is capable of producing a high number of inflammatory markers such as C-reactive protein and the so-called adipocytokines. The most important are: leptin, adiponectin, resistin, interleukins and tumor necrosis factor alpha (TNF-α), among others.[17,18,19,20]

CONCLUSIONS

Cardiometabolic risk markers were found in overweight and obese middle-aged women.

BIBLIOGRAPHIC REFERENCES

1. Malo Serrano M, Castillo N, Pajita D. La obesidad en el mundo. An Fac med [Internet]. 2017 [cited 02/07/2022];78(2):173-178. Available at: http://www.scielo.org.pe/scielo.php?script=sci_arttext&pid=S1025-55832017000200011. http://dx.doi.org/10.15381/anales.v78i2.13213
2. Cabrerizo L, Rubio MA, Ballesteros MD, Moreno Lopera C. Complicaciones asociadas a la obesidad. Rev Esp Nutr Comunitaria [Internet]. 2008 [cited 02/07/2022];14(3):156-162. Available at: http://www.fesnad.org/resources/files/Publicaciones/RevNutCom/4.pdf
3. Kyrgiou M, Kalliala I, Markozannes G, Gunter MJ, Paraskevaidis E, Gabra H, et al. Adiposity and cancer at major anatomical sites: umbrella review of the literature. BMJ [Internet]. 2017 [cited 02/07/2022];356:j477. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5421437/. https://doi.org/10.1136/bmj.j477
4. Aranceta Bartrina J, Pérez Rodrigo C, Alberdi Aresti G, Ramos Carrera N, Lázaro Masedo S. Prevalencia de obesidad general y obesidad abdominal en la población adulta española (25-64 años) 2014-2015: estudio ENPE. Rev Esp Cardiol [Internet]. 2016 [cited 02/07/2022];69(6):579-587. Available at: https://www.sciencedirect.com/science/article/abs/pii/S0300893216001068. https://doi.org/10.1016/j.recesp.2016.02.010

5. World Health Organization. Waist Circumference and Waist-Hip Ratio. Report of a WHO Expert Consultation. Geneva: OMS; 2008 [cited 02/07/2022]. Available at: https://apps.who.int/iris/bitstream/handle/10665/44583/9789241501491_eng.pdf
6. De la Osa JA. ¿Nacemos o nos hacemos obesos? [Internet]. La Habana: Diario Granma; 30/03/2012 [cited 02/07/2022]. Available at: http://www.granma.cu/granmad/2012/03/30/nacional/artic05.html
7. Landrove Rodríguez O, Morejón Giraldoni A, Venero Fernández S, Suárez Medina R, Almaguer López M, Pallarols Mariño E, et al. Enfermedades no transmisibles: factores de riesgo y acciones para su prevención y control en Cuba. Rev Panam Salud Pública [Internet]. 2018 [cited 02/07/2022];42:e23. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6386105/. https://doi.org/10.26633/RPSP.2018.23
8. Bonet Gorbea M, Varona Pérez P. III Encuesta Nacional de factores de riesgo y actividades preventivas de enfermedades no transmisibles. Cuba 2010-2011 [Internet]. La Habana: Editorial Ciencias Médicas; 2015 [cited 02/07/2022]. Available at: http://www.ecimed.sld.cu/2014/08/07/1897/
9. Belaunde Clausell A, Arada Collado A. Sobrepeso y obesidad en mujeres laboralmente activas de un área de salud. Rev Cubana Med Gen Integr [Internet]. 2020 [cited 01/12/2022];36(4):e1234. Available at: http://scielo.sld.cu/pdf/mgi/v36n4/1561-3038-mgi-36-04-e1234.pdf
10. Shah SM, Nanan D, Rahbar MH, Rahim M, Nowshad G. Assessing obesity and overweight in high mountain Pakistani population. Trop Med Int Health [Internet]. 2004 [cited 01/12/2022];9(4):526-32. Available at: https://www.ncbi.nlm.nih.gov/pubmed/15078272. https://doi.org/10.1111/j.1365-3156.2004.01220.x
11. Marchi J, Berg M, Dencker A, Olander EK, Begley C. Risks associated with obesity in pregnancy, for the mother and baby: a systematic review of reviews. Obes Rev [Internet]. 2015 [cited 02/07/2022];16(8):621-38. Available at: https://pubmed.ncbi.nlm.nih.gov/26016557/. https://doi.org/10.1111/obr.12288
12. Fernández Alba JJ, Paublete Herrera MC, González Macías MC, Carral San Laureano F, Carnicer Fuentes C, Vilar Sánchez Á, et al. Sobrepeso y obesidad maternos como factores de riesgo independientes para que el parto finalice en cesárea. Nutr Hosp [Internet]. 2016 [cited 02/07/2022];33(6):1324-1329. Available at: https://scielo.isciii.es/scielo.php?script=sci_arttext&pid=S0212-16112016000600011. https://dx.doi.org/10.20960/nh.778
13. Li X, Tan H, Huang X, Zhou S, Hu S, Wang X, et al. Similarities and differences between the risk factors for gestational hypertension and preeclampsia: A population based cohort study in south China. Pregnancy Hypertens [Internet]. 2016 [cited 02/07/2022];6(1):66-71. Available at: https://pubmed.ncbi.nlm.nih.gov/26955775/. https://doi.org/10.1016/j.preghy.2015.11.004
14. Huo X, Gao L, Guo L, Xu W, Wang W, Zhi X, et al. Risk of non-fatal cardiovascular diseases in early-onset versus late-onset type 2 diabetes in China: a cross-sectional study. Lancet Diabetes Endocrinol [Internet]. 2016 [cited 02/07/2022];4(2):115-24. Available at: https://pubmed.ncbi.nlm.nih.gov/26704379/. https://doi.org/10.1016/s2213-8587(15)00508-2
15. Navarro Despaigne D, León Sánchez A, Roca Soler I. Calidad de vida en mujeres de edad mediana de La Habana. Rev Cubana Obstet Ginecol [Internet]. 2017 [cited 01/12/2022];43(2):[aprox. 13 p.]. Available at: http://revginecobstetricia.sld.cu/index.php/gin/article/view/137/145
16. Irecta Najera CA, Álvarez Gordillo GC. Mecanismos moleculares de la obesidad y el rol de las adipocinas en las enfermedades metabólicas. Rev Cubana Invest Bioméd

[Internet]. 2016 [cited 01/12/2022];35(2):174-83. Available at: http://scielo.sld.cu/pdf/ibi/v35n2/ibi06216.pdf
17. von Bibra H, Saha S, Hapfelmeier A, Müller G, Schwarz PEH. Impact of the Triglyceride/High-Density Lipoprotein Cholesterol Ratio and the Hypertriglyceremic-Waist Phenotype to Predict the Metabolic Syndrome and Insulin Resistance. Horm Metab Res [Internet]. 2017 [cited 02/07/2022];49(7):542-549. Available at: https://pubmed.ncbi.nlm.nih.gov/28597452/. https://doi.org/10.1055/s-0043-107782
18. Suarez González JA, Gutiérrez Machado M. Caracterización del riesgo cardiometabólico en mujeres de edad mediana con antecedentes de preeclampsia en la última década. CorSalud [Internet]. 2019 [cited 02/07/2022];11(1):30-36. Available at: http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S2078-71702019000100030
19. Armaza Céspedes AX, Chambi Cayo TT, Mamani Ortiz Y, Abasto González S, Luizaga López JM. Factores de riesgo nutricionales asociados al Síndrome Metabólico en personal militar de la Fuerza Aérea de Cochabamba, Bolivia. Gac Med Bol [Internet]. 2016 [cited 02/07/2022];39(1):20-5. Available at: http://www.scielo.org.bo/scielo.php?script=sci_arttext&pid=S1012-29662016000100005
20. Miguel Soca PE. Predictores de riesgo cardiometabólico. Rev Finlay [Internet]. 2015 [cited 01/12/2022];5(2):80-1. Available at: http://www.revfinlay.sld.cu/index.php/finlay/article/view/357/1400

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

CONTRIBUTION OF THE AUTHORS

JASG, MGM: conceptualization, research, formal analysis, methodology, visualization, data curation, validation, supervision, writing the original draft, writing (review and editing).