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METABOLIC SYNDROME AND CARDIOVASCULAR RISK BIOMARKERS IN PEOPLE WITH OBSTRUCTIVE SLEEP APNEA

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Background

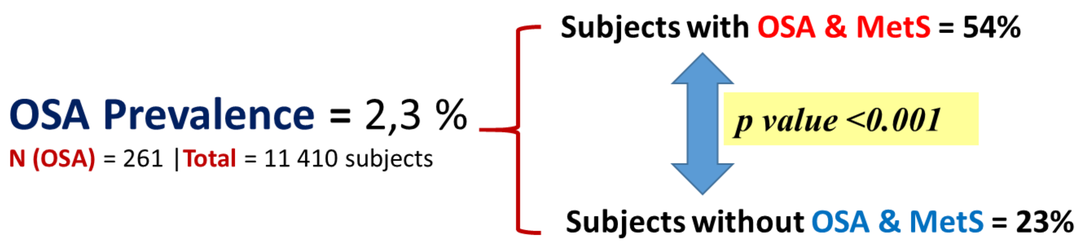
Metabolic syndrome (MS) and cardiovascular risk factors are associated with increased frequency and severity of obstructive sleep apnea (OSA). The aim was to examine, in a representative sample of the Spanish population, the association of OSA with MS, inflammatory and cardiovascular risk biomarkers, as well as their combined effect on health status and cardiovascular disease (CVD).

Methods

A cross-sectional study of 11602 adults participating in the Spanish Nutrition and Cardiovascular Risk Study (ENRICA) was performed. Biomarkers were obtained using standardized laboratory techniques, OSA was defined as having a diagnosis of obstructive sleep apnea, MS according to International Diabetes Federation criteria, and CVD as a diagnosis of myocardial infarction and/or cerebral thrombosis and/or heart failure (*composite variable*). The association was evaluated with linear and logistic regression models, adjusted for age, sex, educational level, tobacco use, alcohol consumption, physical activity, and caloric and monounsaturated and polyunsaturated fat intake.

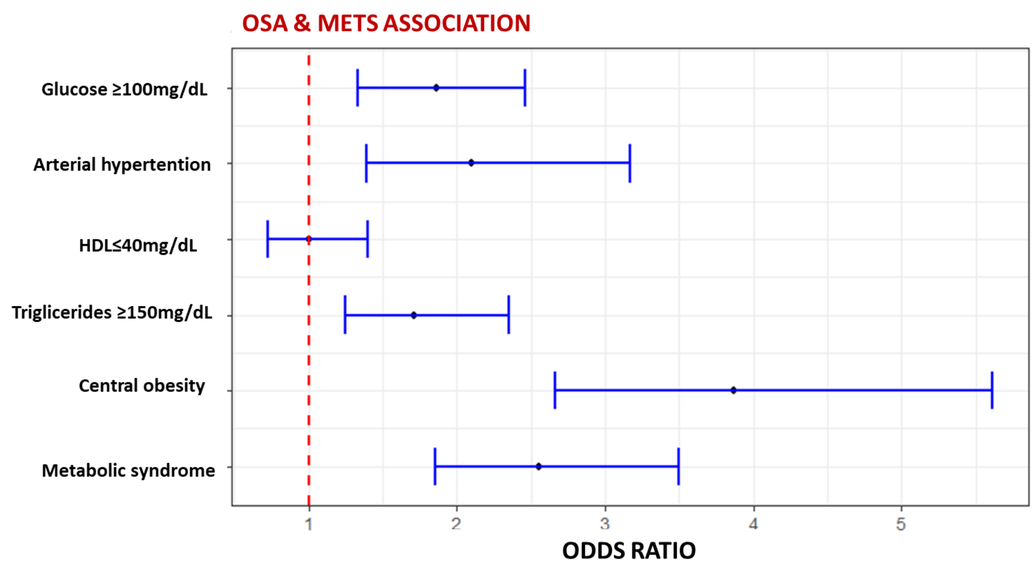
Results

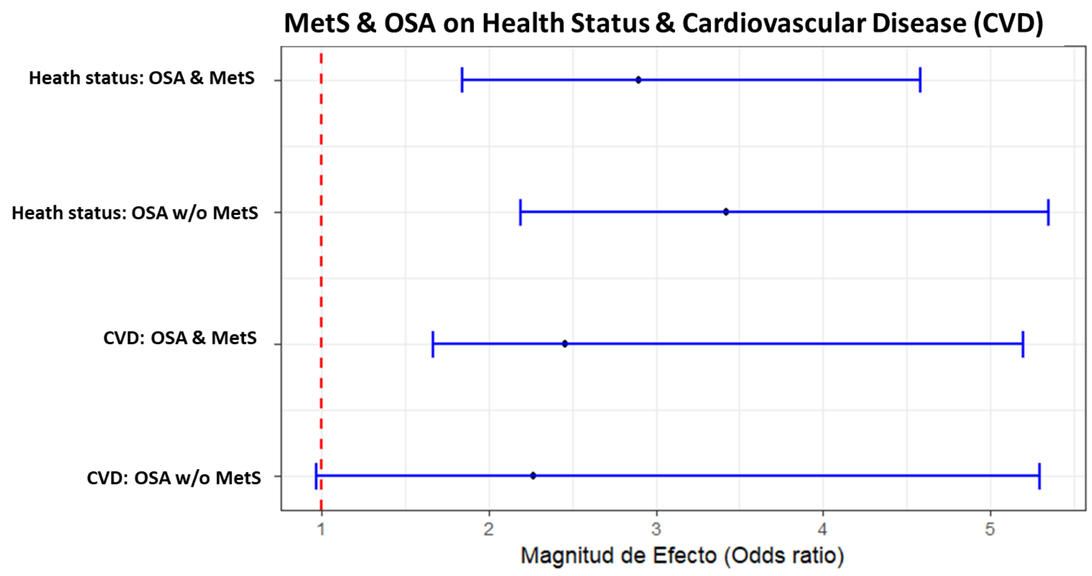
The prevalence of OSA was 2.3% and subjects with OSA had a higher frequency of MS than those without OSA (54% vs. 23%). OSA was associated with an elevated risk of MS (OR=2.54; 95%CI:1.85;3.50) and some of its components (central obesity, elevated blood pressure, triglycerides and glucose). Likewise, OSA was associated with high values of glucose, insulin, HOMA index, triglycerides, leptin and CRP, as well as with low values of HDL, a worse health status and, when coexisting with MS, an increased risk of CVD (OR=2.46; 95%CI:1.17;5.2). Models adjusted for central obesity attenuated their association but without a loss of statistical significance.



Biomarkers of cardiovascular risk and OSA	% [a, b]	95 IC%	p-value	p for interaction [c]
Basal Glucose	6,38	3,02; 9,84	<0,001	0,181
Insulin	39,4	-28,5; 51,2	<0,001	0,912
HOMA index	48,3	35,2; 62,3	<0,001	0,874
HbA1c	2,3	-1,00; 5,00	0,076	0,299
Total Cholesterol	-1,50	-4,70; 1,80	0,364	**<0,001**
HDL-c	-6,60	-9,40; 4,70	<0,001	0,174
LDL-c	-2,20	-6,50; 2,30	0,330	**<0,001**
LDL-c/HDL-c	-4,70	1,00; 9,00	0.015	**<0,001**
Triglicerides	13,00	6,00; 21,00	<0,001	0,051
Leptin	59,00	42,00; 79,00	<0,001	0,641
Fibrinogen	3,00	-1,00; 6,00	0,071	0,259
C reactive protein	35,00	12,00; 62,00	0.020	0,412

IC: confidence interval.
[a] Reference: without OSA.
[b] Porcentual change of geometrics means calculated with generalized linear models with gaussian distribution and logartmic link function, controled by age, sex, educative level, tobacco use, alcohol drinking, physical activity, caloric intake and fat intake.
[c] p for interacción: <40 years & ≥40 years.





Conclusion

In a large sample, representative of the Spanish population, OSA was associated with alterations in biomarkers of cardiovascular risk, greater frequency of MS and its components, poorer health status and, when coexisting with MS, an increased risk of CVD.

Reference

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