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Abstract

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Obstructive sleep apnea (OSA) is characterized by snoring, apneas and excessive daytime sleepiness (EDS). Although commonly present in OSA, factors relating to daytime sleepiness are not fully elucidated. OSA is associated with obesity and with cardiovascular disease, type 2 diabetes mellitus and the metabolic syndrome.

In this population-based study 7,051 women answered a questionnaire on sleep and health. Psychological distress, insomnia and somatic disease were the factors most strongly related to both EDS and fatigue independent of other factors. Snoring was independently associated with both EDS and fatigue, but the associations were relatively weak.

In addition, 400 of the women underwent polysomnography and an oral glucose tolerance test. OSA was associated with changes in glucose metabolism independently of confounders such as central obesity. Moreover, low minimal saturation was independently associated with reduced insulin sensitivity.

In women sleeping <6-7 hours there was a substantial increase in waist circumference and short sleep duration remained associated with central obesity, even after adjusting for body mass index (BMI). The most pronounced negative influence of short sleep duration and also reduced duration of slow-wave sleep (SWS) or rapid eye movement (REM) sleep was seen in women <50 years.

All measures of OSA were related to the metabolic syndrome after adjustments. In addition, the relationship remained after adjusting for central or general obesity. Hypoxia was independently associated with hypertriglyceridemia, even after adjusting for BMI.

In conclusion, OSA may have significant impact on insulin sensitivity and metabolism in women, and the relationship could, to some extent, be mediated through hypoxia. Moreover, reduced sleep duration and loss of SWS and REM sleep may influence central obesity; a strong risk factor for OSA. Daytime sleepiness was most strongly related to psychological distress, insomnia and somatic disease although snoring was also a risk factor. This finding indicates that sleep apnea is only one factor contributing to daytime sleepiness in women.

Keywords: sleep apnea, sleep duration, daytime sleepiness, central obesity, insulin sensitivity, metabolic syndrome, women, population-based

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