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Hang Yang

Department of Respiratory and Critical Care Medicine, The 958th Hospital of the Chinese People's Liberation Army Ground Force, 400020, Chongqing, China

Association between Obstructive Sleep Apnea and Cardiovascular Event Risk: A 5-Year Prospective Cohort Study Based on a Single-Center Health Examination Population

Background

Obstructive sleep apnea (OSA) is a potential risk factor for cardiovascular disease, but prospective evidence from the Chinese population remains limited. This study aimed to investigate the association between OSA-related indicators and the 5-year risk of cardiovascular events using a single-center health examination cohort.

Methods

This single-center, prospective cohort study enrolled 312 middle-aged and elderly residents (aged 55–75 years) who underwent health examinations at the Health Examination Center of XX Hospital between January 2018 and December 2023. None had a history of cardiovascular disease at baseline. All participants underwent portable sleep monitoring. Based on the apnea-hypopnea index (AHI), participants were divided into two groups: no/mild OSA (AHI <15) and moderate-to-severe OSA (AHI $\geqslant$15). The primary endpoint was the occurrence of composite cardiovascular events (including myocardial infarction, stroke, cardiovascular death, hospitalization for cardiovascular events, and coronary revascularization) during 5-year follow-up. Multivariable Cox proportional hazards regression models were used to analyze the associations of moderate-to-severe OSA and nocturnal lowest oxygen saturation ($LSpO_2$) with the endpoint events.

Results

After a median follow-up of 4.8 years, 68 composite cardiovascular events were documented (incidence rate 21.8%). After multivariable adjustment, compared with the no/mild OSA group, the moderate-to-severe OSA group had a hazard ratio (HR) for cardiovascular events of 2.38 (95% CI: 1.42–3.99). Additionally, nocturnal $LSpO_2$ <85% was an independent predictor of events independent of AHI (HR 1.88, 95% CI: 1.12–3.15). Subgroup analysis showed that the cardiovascular risk associated with OSA was higher in patients with hypertension (HR 2.76, 95% CI: 1.58–4.82).

Conclusions

In a single-center health examination population, moderate-to-severe OSA was significantly associated with a 5-year risk of cardiovascular events, with an HR of 2.38. This study had a moderate sample size (312 participants) and a feasible 5-year follow-up period, providing evidence-based support for OSA screening in health examination settings.

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