

Simple diagnostic tools for the screening of sleep apnea in subjects with high risk of cardiovascular disease

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Cardiovascular (CV) disease is a leading cause of global disease burden. Accumulating evidence indicates that obstructive sleep apnea (OSA) is an important modifiable risk factor for CV disease. Economic development in China has driven changes in diet and lifestyle. The prevalence of OSA is likely to increase as rates of obesity continue to rise. It is important to note that, high CV risk subjects with moderate-severe OSA may be minimally symptomatic. Simple diagnostic tools could facilitate the detection of OSA and the early application of treatments to reduce associated morbidity and risks of future disease. We performed a cooperative validation study which is a non-randomised, prospective study to test the reliability of a two-stage diagnostic procedure (sleep questionnaire followed by overnight pulse oximetry or nasal pressure, in the home) for identifying cases of moderate-severe OSA, defined by the number of apneas/hypopneas per hour of sleep (apnea-hypopnea index [AHI] ≥ 30).

The study conducted in a high CV risk, community-dwelling population from a District of the inner metropolitan area of Shanghai, China. Potential subjects who consent to participate completed the Berlin Questionnaire to differentiate those at 'high' and 'low' risk of OSA according to published cut-off scores. All those identified as high risk and a selection of low risk subjects will then undergo a brief physical examination, ECG, followed by overnight home polysomnography (PSG) together with pulse oximetry and nasal pressure to diagnose cases of moderate-severe OSA. The study showed that amongst community dwelling high CV risk subjects identified with moderate-severe OSA (ie AHI > 30), approximately 75% were asymptomatic or minimally symptomatic (ESS < 10), 15% were moderately symptomatic (ESS 11-15) and only 10% were markedly symptomatic. Of 257 eligible high CV risk subjects enrolled, 190 completed home sleep studies and 143 subjects' studies were of sufficient quality to be included in the final analyses. Moderate-severe OSA was confirmed in 43% of subjects. The Berlin Questionnaire had a high sensitivity (91.9%) but low specificity (25.9%). ROC curves for oximetry and nasal pressure were not significantly different in any of area under the curve (AUC: 0.933 vs 0.933, respectively), sensitivity (83.9% vs 85.5%), and specificity (84.0% vs 85.2%). But oximetry had fewer study failures. The study supported that portable limited-channel monitoring devices could play a role in early detection and morbidity reduction in detecting obstructive sleep apnea in subjects with high risk of cardiovascular disease.