Respiratory effort during sleep and prevalent hypertension in obstructive sleep apnoea

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The proportion of sleep time spent with increased respiratory effort automatically derived from mandibular jaw movements was a better predictor of prevalent hypertension in patients with OSA than traditional PSG metrics (*e.g.* AHI) http://bit.ly/3TWE08j

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Abstract

Background Mechanisms underlying blood pressure changes in obstructive sleep apnoea (OSA) are incompletely understood. Increased respiratory effort is one of the main features of OSA and is associated with sympathetic overactivity, leading to increased vascular wall stiffness and remodelling. This study investigated associations between a new measure of respiratory effort (percentage of total sleep time spent with increased respiratory effort based on measurement of mandibular jaw movements (MJM): REMOV, %TST) and prevalent hypertension in adults referred for evaluation of suspected OSA.

Methods A machine learning model was built to predict hypertension from clinical data, conventional polysomnography (PSG) indices and MJM-derived parameters (including REMOV). The model was evaluated in a training subset and a test subset.

Results The analysis included 1127 patients: 901 (80%) in the training subset and 226 (20%) in the test subset. The prevalence of hypertension was 31% and 30%, respectively, in the training and test subsets. A risk stratification model based on 18 input features including REMOV had good accuracy for predicting prevalent hypertension (sensitivity 0.75 and specificity 0.83). Using the Shapley additive explanation method, REMOV was the best predictor of hypertension after clinical risk factors (age, sex, body mass index and neck circumference) and time with oxygen saturation <90%, ahead of standard PSG metrics (including the apnoea–hypopnoea index and oxygen desaturation index).

Conclusion The proportion of sleep time spent with increased respiratory effort automatically derived from MJM was identified as a potential new reliable metric to predict prevalent hypertension in patients with OSA.