Arrhythmia and sleep apnea syndrome: state of the art

Hoang Anh Tien

Introduction: Obstructive sleep apnea syndrome (OSAS) leads to cardiovascular complications such as arrhythmia, coronary artery disease, left/right ventricular hypertrophy and dysfunction, heart failure, systemic and pulmonary hypertension and stroke; and these all cardiovascular complications increase morbidity and mortality of OSAS. Cardiac arrhythmias are common problems in OSA patients.

Methods: Systemic review

Result: The presence and complexity of atrial fibrillation, sick sinus syndrome, sudden cardiac death... definitely influence morbidity, mortality and quality of life for patients with OSA. The mechanisms underlying the link between OSA and cardiac arrhythmias could be the mechanisms that relate a variety of autonomic, hemodynamic, humoral and neuroendocrine responses that evoke acute and chronic changes in cardiovascular function. Increased sympathetic activity by hypoxemia and endothelial dysfunction play a role in cardiovascular complications. Plasma renin receptor (RR), heart-type fatty acid binding protein (h-FABP) and B-type natriuretic peptide (BNP) are the new biomarkers for predicting the arrhythmia complication. Obstructive sleep apnea exaggerates intrathoracic pressure changes, which in itself and via vagal activation can provoke shortening of the atrial action potential and induce AF (atrial fibrillation). Risk factor reduction and continuous positive airway pressure ventilation can reduce AF recurrence. Obstructive sleep apnea screening is suitable for AF patients with risk factors. Obstructive sleep apnea treatment should be optimized to improve AF treatment results in appropriate patients. Servo-controlled pressure support therapy should not be used in heart failure with reduced ejection fraction patients with predominantly central sleep apnea (of which 25% had concomitant AF). (European Society of Cardiology 2016 guideline) Treatments for OSA aimed at reducing cardiac events. The treatment has two main categories, by Continuous positive airway pressure (CPAP) or by an Atrial overdrive pacing (AOP). Some study emphasizes the benefits associated with CPAP in decreasing the arrhythmia events compare to AOP.

Conclusion: The link between sleep apnea and arrhythmias such as sick sinus syndrome and sudden cardiac death has been well-documented. The biomarker of oxidative stress, inflammation, endothelial dysfunction, change in circulation factors especially plasma renin receptor level (RR) play an important role in predicting the arrhythmia complication of sleep apnea syndrome. Obstructive sleep apnea treatment should be optimized to improve AF treatment results in appropriate patients (ESC guideline 2016). Continuous positive airway pressure (CPAP) appears to reduce the arrhythmia and cardiovascular diseases consequences of OSA.