Accuracy and Utility of a Pacemaker Respiratory Monitoring Algorithm for the Detection of Obstructive Sleep Apnea in Patients With Atrial Fibrillation

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Abstract

Introduction: The usefulness and diagnostic value of new-generation pacemakers (PM) with enhanced monitoring capabilities are not yet clearly established. The aim of this study was to evaluate the diagnostic utility and accuracy of a PM-incorporated respiratory monitoring algorithm and its interaction with atrial fibrillation (AF).

Methods: A single-center prospective study was performed in consecutive patients who underwent PM implantation featuring a respiratory monitoring algorithm. All patients had polysomnography recording. The respiratory disturbance index of the polysomnography and pacemaker (RDI-PM) were recorded on the same night. Occurrence and burden of AF were also recorded. The diagnostic utility of RDI-PM and its interaction with AF were evaluated.

Results: A total of 81 patients were included (age 73 ± 11 years). Obstructive sleep apnea syndrome (OSAS) was diagnosed in 62%. RDI-PM had good diagnostic accuracy for OSAS (area under the curve: 0.767 [95% CI: 0.65-0.88]; p < 0.001), with an ideal diagnostic cut-off of 13.3 (sensitivity 78%; specificity 78%) and 90% sensitivity for the diagnosis of moderate-to-severe OSAS. Time to AF first episode and total AF burden were not significantly different between patients with and without OSAS. However, in those whose OSAS diagnosis was based on RDI-PM, there was a significantly greater AF burden in patients with vs without OSAS (cut-off ≥13, 488 vs 83 min, p = 0.05). In patients with AF, the RDI-PM cut-off of 13.3 decreased specificity (57%) vs the general population, but in patients without AF the specificity was 100% and sensitivity 77%.

Conclusion: OSAS was prevalent in PM patients. RDI-PM diagnosed OSAS accurately, with high sensitivity for the detection of moderate-to-severe OSAS, making it a suitable screening method. AF, however, significantly decreased the specificity of RDI-PM for OSAS diagnosis.

Keywords: Atrial fibrillation; Obstructive sleep apnea syndrome; Pacemaker; Sleep apnea monitoring.