

Association of Nocturnal Arrhythmias with Sleep-disordered Breathing

The Sleep Heart Health Study

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Abstract

Rationale: Sleep-disordered breathing recurrent intermittent hypoxia and sympathetic nervous system activity surges provide the milieu for cardiac arrhythmia development.

Objective: We postulate that the prevalence of nocturnal cardiac arrhythmias is higher among subjects with than without sleep-disordered breathing.

Methods: The prevalence of arrhythmias was compared in two samples of participants from the Sleep Heart Health Study frequency-matched on age, sex, race/ethnicity, and body mass index: (1) 228 subjects with sleep-disordered breathing (respiratory disturbance index ≥ 30) and (2) 338 subjects without sleep-disordered breathing (respiratory disturbance index < 5).

Results: Atrial fibrillation, nonsustained ventricular tachycardia, and complex ventricular ectopy (nonsustained ventricular tachycardia or bigeminy or trigeminy or quadrigeminy) were more common in subjects with sleep-disordered breathing compared with those without sleep-disordered breathing: 4.8 versus 0.9% ($p = 0.003$) for atrial fibrillation; 5.3 versus 1.2% ($p = 0.004$) for nonsustained ventricular tachycardia; 25.0 versus 14.5% ($p = 0.002$) for complex ventricular ectopy. Compared with those without sleep-disordered breathing and adjusting for age, sex, body mass index, and prevalent coronary heart disease, individuals with sleep-disordered breathing had four times the odds of atrial fibrillation (odds ratio [OR], 4.02; 95% confidence interval [CI], 1.03–15.74), three times the odds of nonsustained ventricular tachycardia (OR, 3.40; 95% CI, 1.03–11.20), and almost twice the odds of complex ventricular ectopy (OR, 1.74; 95% CI, 1.11–2.74). A significant relation was also observed between sleep-disordered breathing and ventricular ectopic beats/h ($p < 0.0003$) considered as a continuous outcome.

Conclusions: Individuals with severe sleep-disordered breathing have two- to fourfold higher odds of complex arrhythmias than those without sleep-disordered breathing even after adjustment for potential confounders.