AUTONOMIC NERVOUS SYSTEM ACTIVITY PRECEDING NOCTURIA IN OLDER ADULTS

Hypothesis / aims of study
Pathological nocturia is a frequent cause of morbidity and is the leading cause of sleep disruption in older adults. Yet, the mechanisms of sleep disruption remain poorly understood. The proposed study aims to improve our understanding of these mechanisms by examining the autonomic nervous system during sleep preceding nocturia.

Study design, materials and methods
Heart rate variability was measured over 5-minute segments of artifact-free ECG data in order to compute post-hoc the ratio of low-frequency to high-frequency spectral power (LF/HF), where greater LF/HF indicates sympathovagal activation. We analyzed data from the first void of the night where the following 3 segments of ECG data were available: S3, during the last 5 minutes of sleep prior to the awakening preceding the nocturic event; S2, during the last 5 minutes of sleep prior to the last non-micturition-related awakening preceding S3; and S1, during the first 5 minutes of sleep following either the prior void or sleep onset. Differences in LF/HF between S3-S2 and between S3-S1 were compared between 6 overactive bladder (OAB) subjects and 4 primary insomniacs.

Results
There were no notable differences between OAB and insomnia groups for age (65.2 ± 4.8 vs. 58.8 ± 11.0 years), BMI (25.7 ± 5.5 vs. 23.4 ± 3.6), and gender distribution (4:2 vs. 3:1 F:M ratio). In OAB subjects, the relative change in LF/HF between S2 and S3 was greater than in insomniacs (165.1 ± 134.9% vs. -17.7 ± 118.0%; p<0.03). Similarly, the relative change in LF/HF between S3 and S1 was greater in OAB subjects than in insomniacs (147.6 ± 259.8 vs. 76.8 ± 118.0%).

Interpretation of results
Evidence of sympathovagal activation prior to nocturia in OAB subjects contrasting with the lack thereof amongst insomniacs strongly suggest that sympathovagal activation may be specific to micturition-related awakenings in older OAB subjects.

Concluding message
Autonomic nervous system during sleep prior to micturition-related awakenings is specifically characterized by sympathovagal activation in older OAB subjects compared to older insomniacs as well as compared to sleep prior to non-micturition-related awakenings.

References

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Is this a clinical trial? No
What were the subjects in the study? HUMAN
Was this study approved by an ethics committee? Yes
Specify Name of Ethics Committee Duke University Health System IRB
Was the Declaration of Helsinki followed? Yes
Was informed consent obtained from the patients? Yes