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# 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[1]. 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[2, 3] 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: $S_3$, during the last 5 minutes of sleep prior to the awakening preceding the nocturic event; $S_2$, during the last 5 minutes of sleep prior to the last non-micturition-related awakening preceding $S_3$; and $S_1$, during the first 5 minutes of sleep following either the prior void or sleep onset. Differences in LF/HF between $S_3$-$S_2$ and between $S_3$-$S_1$ 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 $S_2$ and $S_3$ 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 $S_3$ and $S_1$ 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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| ***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** |