

CONSIDER A DIAGNOSIS OF OBSTRUCTIVE SLEEP APNEA IN PATIENTS WITH NOCTURIA, EVEN WHEN DAYTIME OVERACTIVE BLADDER SYNDROME IS PRESENT.

Hypothesis / aims of study

Nocturia is a bothersome and common complaint, known to be associated with several chronic medical conditions including obstructive sleep apnea (OSA). Nocturia is also a major feature of overactive bladder syndrome (OAB). The clinical algorithm promoted by the International Continence Society for investigation of nocturia suggests that OSA be considered in patients with nocturnal polyuria, and that OAB be considered as an underlying cause in patients with small voided volumes during both day and night. Since home-based sleep studies are less expensive and more convenient than hospital-based studies, many centers in the USA have moved to home-based testing. Our objectives were (1) to determine whether home-based sleep studies are acceptable to patients with nocturia and whether the data would be interpretable, (2) to obtain pilot data concerning the prevalence of OSA in clinical patients with nocturia, including those with OAB, (3) to explore associations between the quality of sleep and the severity of nocturia, and (4) to determine whether patients with OSA differed from those without OSA with respect to urinary concentration during the night. We hypothesized that patients with OSA would have nocturnal polyuria and produce relatively dilute urine during the night.

Study design, materials and methods

Following approval by our institutional review board, we recruited subjects to two study groups. Participants in the Nocturia group reported at least one nightly awakening to void. Non-nocturic controls reported no nocturia and no symptoms of urgency or frequency. Women with diabetes mellitus or insipidus, finger anomaly, urinary retention or who were taking hypnotics were excluded. Participants completed validated urinary symptom questionnaires concerning nocturia (ICI-N, ICI-NqoL) and urinary incontinence (Medical, Epidemiological and Social aspects of Aging, MESA). Demographic data, including age, race and medical history was recorded from patients' charts.

Sleep studies were performed using the ambulatory sleep apnea monitor (Watch PAT-100, Itamar Medical, Cesaria, Israel), which measures sympathetic activation levels and oxygen saturation using two sensors mounted on the fingers of one hand. Participants slept with the device for one night at home, and returned the device on the following morning along with two urine samples; one from the last void before bedtime and one from the first void in the morning. Urine samples were analysed for osmolarity using micro osmometer 3MO (Baxter, USA). Statistical analyses consisted of Fischer exact test for proportions and Spearman's correlations. All tests considered significant at the 5% level.

Results:

Twenty five patients, eighteen with nocturia and 7 non-nocturics, were included in the study. Fifteen (83%) of the 18 patients with nocturia had a clinical diagnosis of OAB i.e. they also had daytime urgency and frequency, with or without urge incontinence. Median nocturic frequency was 3 (range 1-4) in the nocturia group and was 0 in the control group. Mean age was 62 years (range 39-81) and mean BMI was 27.5 (20-39). Fifteen (83%) women with nocturia had OSA, compared to 2 (29%) of the control group ($p < .02$). Thirteen (72%) nocturic patients had a decrease in urine osmolarity overnight compared with 2 (33%) patients of the control group ($p = .19$).

Neither apnoea hypopnoea index (AHI) nor the respiratory distress index (RDI) correlated with the total scoring of the ICIQ-N or MESA. Nocturic patients had lower median pREM compared to controls (18 ± 6 vs. 23 ± 6 , $p = .025$), and a moderate inverse correlation was found between the percentage of REM sleep time (pREM) and nocturic frequency ($\rho = -.594$, $p < .006$). Patients' reported bother from nocturia and its interference with daily activities were also negatively correlated with pREM ($\rho = -.503$, $p < .024$, $\rho = -.446$, $p < .05$ figure 1). A trend towards a significant negative correlation was also found between the pREM sleep and total score on QOL-NqoL ($\rho = -.402$, $p < .08$). Finally, a moderate inverse correlation was found between oxygen desaturation index and total MESA urge subscale scoring ($\rho = -.43$, $p < .04$).

Interpretation of results

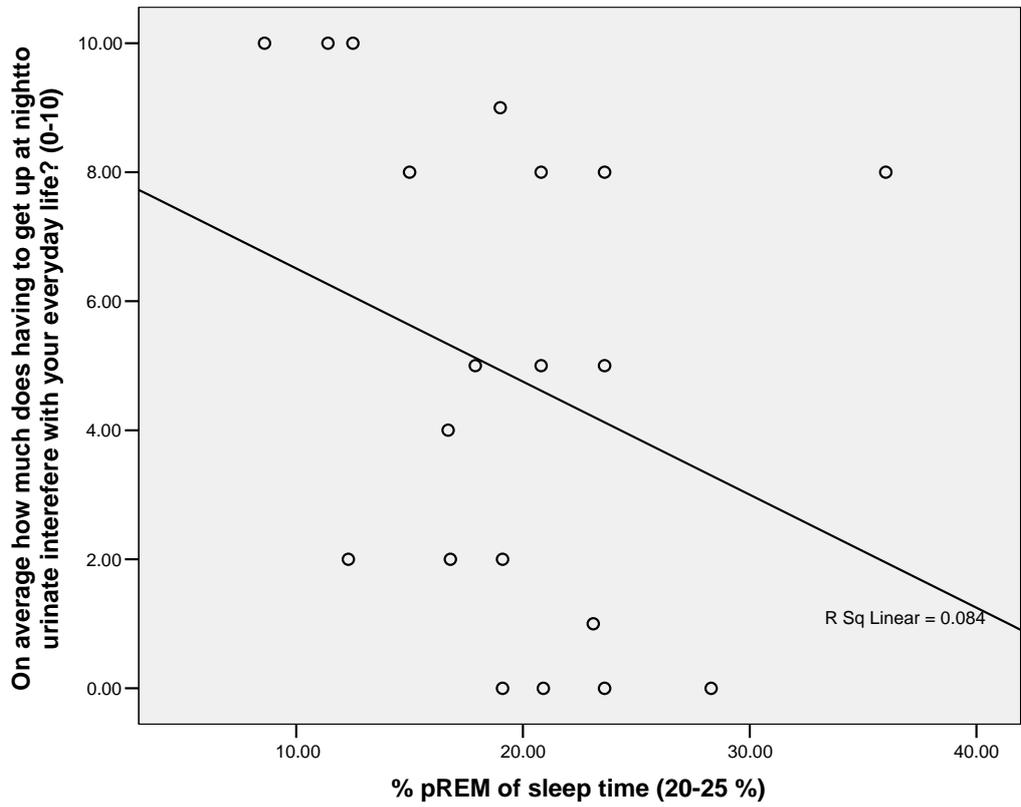
Our results suggest that OSA is highly prevalent among patients with nocturia, even when OAB is clinically diagnosed, and that we should not confine our suspicion of OSA to patients with a pure clinical picture of nocturnal polyuria. We also confirm that nocturia is associated with decreased sleep quality. We also raise the possibility that diminished nocturnal urine concentration may signal the presence of OSA.

Concluding message

Clinical suspicion of OSA should not be confined to nocturic patients with nocturnal polyuria.

Figure1.

Inverse correlation between pREM and the bother from inference from sleep.



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CLINICAL TRIAL REGISTRATION: This clinical trial has not yet been registered in a public clinical trials registry.
HUMAN SUBJECTS: This study was approved by the IRB - Loyola University, Chicago, Illinois and followed the Declaration of Helsinki Informed consent was obtained from the patients.