

THE RELATIONSHIP OF NOCTURNAL POLYURIA IN OLDER MEN TO OBSTRUCTIVE SLEEP APNEA

Hypothesis / aims of study:

The aim of this study is to examine the relationship between Obstructive Sleep Apnea (OSA), a common affliction associated with aging, and Nocturnal Polyuria (NP), one of the most bothersome ailments of older men. The study is based on two groups of men of similar ages, one group of OSA sufferers and another group which is free of the affliction.

Study design, materials and methods:

A total of 83 male patients 60 years old or older suffering from Nocturnal Polyuria were hospitalized and enrolled in this study. Two groups were identified: one group of patients with Obstructive Sleep Apnea and another free of OSA. At the first examination, blood pressure, blood count, standard chemistry panel, brain natriuretic peptide (BNP) and urinalysis were routinely assessed. All patients were requested to void urine at 22.00 and 06.00 hours. A single urine sample voided at 06.00 hours was obtained from all patients to measure urinary Arginine vasopressin (AVP) (U-AVP), urinary sodium (U-Na), urinary creatinine (u-Cre) and urinary osmolality. OSA patients were so diagnosed by apnea-hypopnea index (AHI) obtained from polysomnography (PSG). Frequency volume chart (FVC) was recorded at the same time that PSG was performed. Nocturnal Polyuria was defined and associated with a patient if his nocturnal voided volume was greater than 35% of his 24-hour production (Nocturnal Polyuria index $\geq 35\%$).

Results:

49 patients were diagnosed with OSA and 34 were not. Based on these findings two groups of patients were established. Among the 83 patients there was no significant difference in the average age, diastolic blood pressure and electrolytes in their blood. However, body mass index, systolic blood pressure, AHI and BNP in patients with OSA were significantly higher than those without OSA (Table 1.). Regarding urinary analysis, there was no difference in u-AVP/ u-Cre but u-Na/ u-Cre and urinary osmolality in patients with OSA were significantly higher. On the FVC, there was no significant difference in nocturnal urine volume, 24 hour production or nocturnal polyuria index between the two groups.

Interpretation of results:

BNP, U-Na/U-Cre and urinary osmolality in patients with OSA were higher than those without OSA. U-AVP/U-Cre in patients both with and without OSA was low. These findings suggest that both sodium diuretics due to BNP and water diuretics due to the decrease in AVP secretion might be involved in Nocturnal Polyuria in older patients with OSA.

Concluding message:

This study suggests that Obstructive Sleep Apnea influences nocturnal urine production with high osmolality in older men. Therefore, when we treat older men suffering from Nocturnal Polyuria and high urine osmolality, we should not rule out OSA as one of the cause of NP.

Table 1. Baseline of each parameter in two groups divided according to with or without OSAS

Baseline Parameters	OSAS		P Value
	With (n=49)	Without (n=34)	
Age (y)	69.4 ± 6.8	69.4 ± 4.4	0.4046
BMI (kg/m ²)	26.4 ± 3.2	23.2 ± 3.3	<0.0001
Blood pressure (mmHg)			
Systolic	142.1 ± 20.6	132.9 ± 16.4	0.0396
Diastolic	82.4 ± 12.8	76.8 ± 13.3	0.0804
AHI	36.3 ± 14.3	3.6 ± 0.9	<0.0001
Na (mEq/L)	140.9 ± 2.4	140.7 ± 2.6	0.434
K (mEq/L)	4.3 ± 0.5	4.0 ± 0.4	0.1189
Cl (mEq/L)	105.0 ± 3.5	103.8 ± 2.2	0.1424
Ca (mEq/L)	9.3 ± 0.4	9.2 ± 0.5	0.4257
Creatinine (mg/dL)	0.9 ± 0.2	0.8 ± 0.1	0.0624
Blood sugar (mg/dL)	96.1 ± 7.2	96.2 ± 4.8	0.4874
BNP (pg/mL)	48.6 ± 41.4	30.7 ± 31.5	0.0006
urinary analysis			
uNa/uCre (mEq/L/Cr)	24.7 ± 11.3	16.2 ± 5.1	<0.0001
uK/uCre (mEq/L/Cr)	4.0 ± 3.3	3.9 ± 3.6	0.3544
uAVP/uCre (pg/mL/Cr)	6.7 ± 10.4	6.8 ± 7.8	0.3617
Urinary Osmolarity (mOsm/L)	616 ± 172	516 ± 174	0.0285
Frequency volume chart			
Nocturnal voided volume (mL)	712 ± 271	688 ± 213	0.7249
Nocturia	2.2 ± 2.1	2.5 ± 1.0	0.0115
24-hr Voided volume (mL)	1500 ± 491	1470 ± 328	0.7284
24-hr Frequency	8.2 ± 2.7	11.4 ± 2.5	<0.0001
Nocturnal polyuria index (%)	0.49 ± 0.11	0.47 ± 0.11	0.7042
Maximum voided volume(ml)	372 ± 137	289 ± 61	0.0048

References

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Disclosures

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