

# Gender Differences in Prevalence of Nocturia in Patients with Obstructive Sleep Apnea Syndrome (OSAS)

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## Hypothesis / aims of study

Obstructive sleep apnea syndrome (OSAS) causes sleep deprivation-induced symptoms like daytime sleepiness and indirectly induces systemic symptoms, such as hypertension and impaired glucose tolerance. Many studies have demonstrated that OSAS should be diagnosed and treated at an early stage. As OSAS generally induces vague and non-quantitative symptoms, it is difficult for patients and their doctors to determine that OSAS might be the cause of their symptoms. Therefore, it is likely that many people with OSAS remain undiagnosed. Nocturia is a multifactorial disorder and OSAS has been suggested as a possible underlying cause of nocturia which is frequently not recognized, even in the field of urology. Continuous Positive Airway Pressure (C-PAP) is a well-established therapy for OSAS. Previous studies are limited by the low number of included patients and have not studied gender differences. In this study, we aimed to assess the incidence of nocturia in patients with OSAS who received C-PAP treatment. We analysed the effect of C-PAP on nocturia episodes.

## Study design, materials and methods

All patients who received a C-PAP mask for OSAS in 2014 and 2015 at the pulmonology department of our hospital (N= 727), were invited for a telephone interview. After informed consent, all patients were questioned about their nocturia episodes prior and after C-PAP. Their concomitant diseases, medication and medical history were scored.

## Results

539 patients (399 male and 140 female), took part in our study. The mean age was 62 years (Range 28-93). From these 539 patients, 143 reported to have had no nocturia episodes prior to C-PAP. The results are summarized in table 1.

**Table 1. Summary of the results for all Patients**

Nocturia Episodes before C-PAP	No patients N=539 140 ♀ & 399 ♂	Patients with reduction to 0x Nocturia	Patients with reduction to 1x Nocturia	Patients with reduction to 2x Nocturia	Patients with reduction to 3x Nocturia	Patients with reduction to 4x Nocturia
0	143	-	-	-	-	-
1	126	44 (35%)	-	-	-	-
2	153	62 (40%)	36 (24%)	-	-	-
3	55	22 (40%)	28 (51%)	4 (1%)	-	-
4	40	17 (43%)	4 (10%)	2 (5%)	4 (10%)	-
5	15	-	3	6	-	3
6	3	-	3	-	-	-
7	4	-	1	3	-	-
<b>MALE patients</b>						
0	116	-	-	-	-	-
1	95	30 (32%)	-	-	-	-
2	115	42 (37%)	32 (28%)	-	-	-
3	34	20 (59%)	14 (41%)	-	-	-
4	29	14 (54%)	4 (14%)	-	3 (10%)	-
5	6	-	1	2	-	3
6	1	-	1	-	-	-
7	3	-	1	2	-	-
<b>FEMALE patients</b>						
0	27	-	-	-	-	-
1	31	14 (45%)	-	-	-	-
2	38	20 (53%)	4 (10%)	-	-	-
3	21	2 (10%)	14 (67%)	4 (19%)	-	-
4	11	3 (27%)	-	2 (18%)	1 (1%)	-
5	9	-	2 (20%)	4 (40%)	-	-
6	2	-	2 (100%)	-	-	-
7	1	-	-	1 (100%)	-	-

## Interpretation of results

The patients were stratified in groups according to the number of nocturia episodes prior to CPAP. The prevalence of nocturia in patients with OSAS was 71 % in men and 81 % in women. C-PAP reduces nocturia with 1 or more episodes per night in 63% of the affected females and 60% of the affected males.

## Concluding message

The prevalence of nocturia with (N ≥ 1 voids per night) is higher among females (81%) compared to males (71%). The use of frequency volume charts would be the next step to pinpoint the exact amount of successful treatment of nocturia with C-PAP in OSAS. This study is the first large study to show a clear relationship between treatment with C-PAP in patients with primary OSAS complaints and the reduction of their nocturia episodes, stratified by the number of voiding episodes per night.

