

## REDUCTION OF NOCTURIA IN PATIENTS TREATED WITH C-PAP FOR OBSTRUCTIVE SLEEP APNEA SYNDROME

### Hypothesis / aims of study

Continuous Positive Airway Pressure (C-PAP) is a well-established therapy of Obstructive Sleep Apnea Syndrome (OSAS) which is characterized by repetitive complete or partial cessation of airflow during sleep, owing to collapse of the upper airways. C-PAP treatment has been suggested to decrease night-time urinary frequency, by reducing nocturnal urine production and improving patients quality of life[1]. However, all studies are limited by the low number of included patients [2]. As nocturia is underreported, the true incidence of nocturia in the general population and in patients with OSAS is probably much higher. In this study, we aimed to assess the incidence of nocturia in patients with OSAS who received C-PAP treatment. Moreover, we analysed the effect of C-PAP treatment on nocturia episodes.

### Study design, materials and methods

All patients who received a C-PAP mask for OSAS in 2015 at the pulmonology department of our hospital (N= 358), were interviewed and invited to take part in our study. After informed consent, all patients were asked by one of our two interviewers to answer the same set of standardized questions about their nocturia episodes prior and after C-PAP treatment. Moreover, their concomitant disease and medication use, as well as medical history were scored.

### Results

A total of 256 patients (206 male and 50 female), gave consent and took part in the study. The mean age of the patients was 60 years (range 28-92 years). From these 256 patients, 80 patients (31%) reported no nocturia episodes prior or after C-PAP treatment.

The prevalence of nocturia (N ≥ 1 voids per night) was 69 % (176 patients). All patients with nocturia were stratified in groups with nocturia episodes of: 1 times per night in 55 patients (21%), 2 times in 77 patients (30%), 3 times in 19 patients (7%), 4 times in 17 patients (7%), 5 times in 6 patients (2%) and 7 times in 2 patients (1%). Treatment with C-PAP reduces nocturia in 65% with 1 or more episodes per night. Figure 1, illustrates the reduction of nocturia episodes for each subgroup.

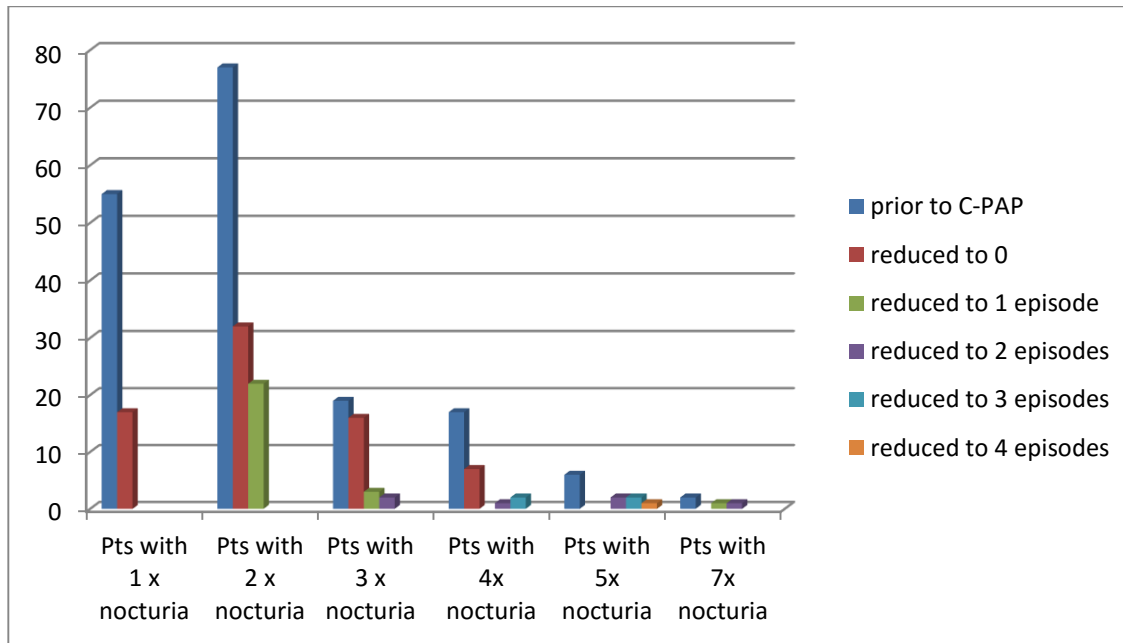
### Interpretation of results

After C-PAP treatment, 17 patients out of the 55 patients(31%) with a single nocturia episode, reported zero episodes of nocturia ( 21% ). From the 77 patients with two episodes of nocturia, an overall improvement was seen in 70% of the patients, i.e. 32 has a reduction to zero (42%) and 22 had a reduction to a single episode of voiding per night (29%). Three episodes of nocturia was reported by 19 patients, with a 94% overall improvement of nocturia, from whom 16 patients had zero episodes after C-PAP treatment (84%) and two patients reported two episodes (10%). In the group of 17 patients who had four nocturia episodes, an overall improvement of 64% was detected: two patients had three (11%), one had two episodes (6%) and 7 had 0 episodes (41%) after C-PAP treatment. Six patients had reported five episodes of nocturia prior to C-PAP treatment and 83% of these patients had an overall improvement of their complaints, from whom one patients had four (17%) and two patients had two episodes of nocturia (33%). Furthermore, two patients in this group reported one episode of nocturia after C-PAP treatment (33%). Both patients that reported seven nocturia episodes had a marked improvement of their nocturia (100%). one patient reported one episode and the other two episodes of nocturia after C-PAP treatment. There were no patients in our study who reported an increase in nocturia episodes after C-PAP treatment. All results are summarized in table 1. The limitation of our study is the retrospective nature of the design which could lead to recall bias. A prospective study, using frequency volume charts would be the next step to pinpoint the exact amount of successful treatment of nocturia with C-PAP in patients with OSAS.

**Table 1. Summary of the results**

Nocturia Episodes before C-PAP	No patients N=256 50 ♀ & 206 ♂	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	80 (31%)	-	-	-	-	-
1	55 (21%)	17 (31%)	-	-	-	-
2	77 (30%)	32 (42%)	22 (29%).	-	-	-
3	19 (7%)	16 (84%)	2(10%)	-	-	-
4	17 (7%)	7 (41%)	-	1(6%)	2 (11%)	-
5	6 (2%)	-	2(33%)	2(33%)	-	1(17%)
7	2 (1%)	-	1(50%)	1(50%)	-	-

Figure 1. The reduction of nocturia episodes for each subgroup.



### Concluding message

The prevalence of nocturia with ( $N \geq 1$  voids per night) among patients with OSAS is 69%. Treatment with C-PAP, reduces nocturia in 65% of patients with 1 or more voiding episodes per night, in patients with OSAS. This study is the first large study to show a clear relationship between OSAS treatment and the reduction of nocturia episodes, stratified by the number of voiding episodes per night.

### References

1. Miyazato M, et al. Effect of continuous positive airway pressure on nocturnal urine production in patients with obstructive sleep apnea syndrome. *Neurourol Urodyn*. 2015 Dec 3. doi: 10.1002/nau.22936.
2. Wang T, et al The Efficacy of Continuous Positive Airway Pressure Therapy on Nocturia in Patients With Obstructive Sleep Apnea: A Systematic Review and Meta-Analysis. *Int Neurourol J*. 2015 Sep;19(3):178-84. doi: 10.5213/inj.2015.19.3.178.

### Disclosures

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