

A Missing Out Case In Advanced Aged Males With Problem Of Urination And Erection: Obstructive Sleep Apnea

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Abstract

Background: To evaluate the relationship between obstructive sleep apnea (OSA) and IPSS, erectile dysfunction and body mass index in men over 50 years with sleep disorder.

Methods: 198 males over 50 years of age with OSA were included to the study. These men had also lower urinary system symptoms and erection complaints. Polysomnographic test was applied for patients with a doubt of OSA. According to the results of Apnea-Hypopnea index (AHI) in the polysomnographic test, patients were evaluated as mild ($AHI \leq 15$), moderate ($AHI = 15-30$) and serious ($AHI > 30$). International Index of Erectile Function (IIEF), International Prostate Symptom Score (IPSS) and quality of life score were documented for all of the patients. The association between AHI index and IPSS, erectile dysfunction, body mass index was shown by gamma coefficient. A value of $p < 0.05$ was considered statistically significant. **Results:** There was no statistically significant association between the stage of sleep apnea and IPSS ($p = 0.545$). There was a statistically significant relationship between the stage of sleep apnea and IIEF ($p < 0.001$). Finally, there was a statistically significant relationship again between the stage of sleep apnea and body mass index ($p < 0.001$).

Conclusions: As long as the severity of the AHI index increases in overweight advanced aged males with sleep problem at night, complaints of erectile dysfunction come into prominence. No relationship was observed between the severity of the AHI index and IPSS.

ABBREVIATIONS

(LUTS): Lower Urinary Tract Symptoms

(OSA) : Obstructive sleep apnea

(AHI) :Apnea-Hypopnea index

(IPSS) :International Prostate Symptom Score

(IIEF) :International Index of Erectile Function

(BPH) : Benign prostate hyperplasia

(ANP) : Atrial natriuretic peptide

(BMI) : Body mass index

INTRODUCTION

Moderate or severe Lower Urinary Tract Symptoms (LUTS) was revealed to be with evidence-based studies in one of each 3 or 4 males aged 50 and older. The prevalence of nocturia increases along with the age. It is 3.4% in males aged under 20 while it elevates up to 32.4% in males over 60 years of age (1, 2). Erectile dysfunction is associated with the age, and encountered particularly between 50-75 years of age (3). OSA is a disorder which occurs during sleep, cruises with sleep interruption and decrease in oxygen saturation at the end of recurrent constriction episodes of the upper airway, and therefore, is characterized by sleeplessness all

day long. This disorder affects approximately 2-4% of the male population (4). In the literature, accompaniment of obstructive sleep apnea was also indicated in males with the lower urinary tract symptoms, nocturia, and decreased strength of erection (5). On the other hand, The most relevant result of these study, performed by a polysomnographic evaluation, is that more than half of a population mainly represented by subjects with severe obesity are affected by moderate or severe sleep apnea (6). Our first starting point in our study was the presence of men aged over 50 years with obstructive sleep apnea. Our other starting point was to show whether there is erectile dysfunction, the presence of overweight, and complaints of urination more than one at night because of complaints of the lower urinary tract on the ground of this sleep problem.

MATERIALS AND METHODS

All patients were evaluated by sleep laboratory in terms of obstructive sleep apnea. Apnea problem was classified according to the AHI (4) index. The patients with the LUTS and nocturia more than one at night were evaluated under more objective criteria with IPSS. The quality of erection

was assessed with responses given to the questions testing the quality of erection with IIEF. Body mass index of all patients accepted into the sleep laboratory was calculated and graded (7). Ethical consent of the study was received and patient informed consent form was prepared. Patients with problem of OSA were evaluated with polysomnography in sleep laboratory, and AHIs of all patients were calculated. Patients who used alpha blocker or 5-alpha reductase inhibitor previously, was operated because of diabetes mellitus, chronic obstructive lung disease, BPH (benign prostate hyperplasia), experienced a surgery for the lower urinary tract, was diagnosed by prostate cancer were excluded from the study. Patients who have neurologic disease (cerebrovascular disease, multiple sclerosis, spinal trauma) that may cause LUTSs, congestive heart insufficiency, edema in legs, urinary incontinence, and urinary tract infections, uses diuretic medication and alcohol were also left out of the study. Prostate volumes in all patients were measured by suprapubic ultrasound. Prostate specific antigen (PSA), complete urine analysis, and creatinine were measured. IPSS form and IIEF form validated by Turkish Association of Urology was filled by patients in both groups, and their LUTS and quality of erection were evaluated.

AHI, IPSS, IIEF, BMI variables in men with OSAS were searched. Gamma coefficient was used in examination of the two-row categorical relationship between variables. Gamma coefficient for dual categorical variables was expressed numerically. According to these results, when the relationship between two variables was found statistically significant, it was expressed as $P < 0.05$.

RESULTS

198 male patients with OSAS were included into the study. The mean age of them was: 46 (26-76), the mean body mass index: 30.3 (17.9-68.3), the mean AHI index: 36.3 (0.2-136), the mean prostate symptom score: 8.91 (0-35), the mean IIEF: 20.19 (6-30). AHI was low in 52 of them, moderate in 56, and high in 90. Prostatism symptoms were not present in 10 of them and were mild in 97, moderate in 63, and severe in 28. According to IIEF, while the majority of the patients had mild or not erection problem, the patients with moderate – severe erection problem were following this order (Table 1-2). The relationship between AHI and IPSS was statistically assessed with gamma coefficient and gamma coefficient was found as 0.061. According to these results, the relationship between these two variables was not found statistically significant ($p = 0.545$). However, gamma

coefficient of the relationship between AHI and IIEF severity was found as 0.520 and related to this, p value was < 0.001 . In other words, the relationship between these two variables was found statistically significant. Identically, gamma coefficient for the relationship between AHI and body mass index was found as 0.384 and related to this, p value was < 0.001 . In other words, the relationship between these two variables was found statistically significant (Table 3).

Table 1

The demographic distribution of OSA the patients

	Min	Max	Median
Age	26	76	46
BMI	17,9	68,3	30,33
AHI	0,2	136	36,33
IPSS	0	35	8,91
IIEF	6	30	20,19

Table 2

The AHI degree, IPSS degree and IIEF degree distribution of OSA the patients

	AHI Degree	LUTS	Erectile Dysfunction
Never		10	49
Mild	52	97	88
Medium	56	63	45
High	90	28	16
Total	198	198	198

Table 3

The relationship between AHI and BMI, IIEF, IPSS in OSA patients

	Gamma coefficient	P value
AHI-IPSS	0,061	0,545
AHI-IIEF	0,520	$< 0,001$
AHI-BMI	0,384	$< 0,001$

DISCUSSION

LUTS was evaluated as synonymous with benign prostate hyperplasia (BPH) for years. In clinical observations, however, the presence of similar symptoms in cases without obstruction and the continuation of complaints in majority of patients whose obstructions were removed by surgery made consider that another factors may exist in pathophysiology of LUTS. OSA may be one of these factors too (8). Regression of nocturia of patients with OSA and without obstructive symptoms but with predominant complaints of nocturia after CPAP treatment is such as to support this opinion. Nocturia is to urinate more than 1 a day by an adult person. While normally nighttime urine production is less than 20% of daily urination in young males, this rate is $< 30\%$ in adults (9). A performed study demonstrated that the most frequent

reason for sleep interruption in advanced aged males is nocturia (10). Cardiovascular diseases, diabetes mellitus, diabetes insipidus, lower urinary tract obstructions, sleep disorders, behavioral and environmental factors, medications, alcohol, use of caffeine, water over-consumption are among pathological states causing nocturia (11). Nocturnal urine production partly depends upon fluid received before bed and hormones such as vasopressin and ANP (atrial natriuretic peptide) (12).

In a study performed on 73 patients with suspicion of OSA by Yoji Moriyama et al., they have noted that the prevalence of nocturia is high among patients with OSA and that the frequency of nocturia of those whose AHI is high is more in males without other urination symptoms under 50 years of age (13). Again, in a study including 88 people with OSA, the frequency of nocturia which is 3.8 before CPAP treatment was reported to regress to 0.7 four months after the treatment (14). Thereby, CPAP treatment was shown to explicitly decrease nocturia in patients with OSA. In contrast to this work in our study, in men aged over 50 years with sleep apnea and the lower urinary tract symptom, the relationship between AHI degree -the severity of sleep apnea- and IPSS was examined with Gamma coefficient (Gamma coefficient=0.061). According to these results, the relationship between these two variables was not found statistically significant ($p=0.545$). In other saying, frequencies of LUTS, the presence of nocturia in men with OSAS were not found significant. We don't explain the reason for this result. In conclusion, patients whose complaint of nocturia is prominent are suggested to be research in terms of OSA.

The development of erectile dysfunction in OSA depends basically on nocturnal hypoxia and interrupted sleep. Vasculogenic, hormonal, neurogenic, and psychogenic factors were held responsible for development of erectile dysfunction. Erectile dysfunction was reported previously in the literature to be a symptom of OSA. Although this relationship between OSA and erectile dysfunction is controversial, sexual problems among males with sleep apnea/hypopnea are common. The incidence of sexual problems among males between 25-65 years of age with sleep apnea was obtained at the rate of 48%. Erectile dysfunction may be a result of co-morbid diseases seen frequently such as vascular diseases and obesity rather than being secondary to OSA in this population (15). In our study, the relationship between IIEF and AHI index in men with sleep apnea and erection problem was shown with gamma coefficient and gamma coefficient was found as

0.520 and related to this, p value was found as <0.001 . In other words, a significant relationship was seen between the severity of AHI and degree of IIEF in men with OSAS. As long as the severity of AHI increases, erection problem was seen to be experienced more severe.

Perimenus et al. have reported for the first time in 1977 that erectile dysfunction is a complication of OSA (16). In a study of our previously published on total 23 patients, 4 of them have mild OSA, 5 have moderate OSA, and 16 have severe OSA, we have found statistically a significant recovery in IIEF scores of patients after CPAP treatment for 3 months in proportion to pre-treatment (17). In the study performed by Perimenus et al., the group receiving only CPAP treatment and the group receiving a combination of CPAP+sildenafil were compared, and the combined treatment was reported to be more effective (18). Use alone of phosphodiesterase type 5 inhibitors (sildenafil) in the treatment of erectile dysfunction seen in patients with OSA is emphasized to exacerbate present sleep apnea even more by increasing predisposition to stenosis in the upper airways by elevating NO (19). Identically, it is also told that the treatment of testosterone may impair sleep pattern through a change in serotonin neurotransmission and may additionally trigger stenosis in the upper airways by demonstrating a hormone effect on oropharynx, and that this effect may be explicit even more in sleep of non-REM (20). Under the light of these information, treatments that will be applied alone without correcting nocturnal hypoxia in OSA patients with erectile dysfunction may remain incapable, may aggravate the present pathology even more. Therefore, the underlying nocturnal hypoxia should primarily be recovered with CPAP treatment.

The most relevant result of these study, performed by a polysomnographic evaluation, is that more than half of a population mainly represented by subjects with severe obesity are affected by moderate or severe sleep apnea. In particular, 24.8% of obese patients were affected by severe OSA, and this alteration was present in 42.1% of men and in 15.4% of women. These results are particularly important if it is taken into account that OSA is a risk factor for hypertension, cardiovascular diseases, pulmonary hypertension, asthma, and impairment of carbohydrate metabolism and endocrine function. It is also possible that the effect of weight loss in reducing the cardiovascular risk associated with severe obesity might be due, at least in part, to a simultaneous reduction of sleep breathing disorders in these patients (6).

Another study shows that OSA is present in more than 50%

of patients with a mean BMI higher than 40.0, and that neck circumference in men and BMI and age in women are the strongest predictors of sleep apnea severity. It also suggests that morbid obesity may well be responsible for daytime sleepiness, even in the absence of sleep apnea (21). In our study, men with sleep apnea and whose the mean body mass index is over 30 were evaluated. We have seen a significant relationship between AHI index and body mass index. In other words, gamma coefficient between BMI and AHI variables was found as 0.384 and related to this, p value was found <0.001. That is to say, the relationship between these two variables was found statistically significant. In other saying, a relationship was seen between the severity of sleep apnea and overweight in men with weight problem.

CONCLUSION

While there is a significant relationship between AHI index and IIEF and BMI in men with OSAS, we have not observed a relationship between AHI index and IPSS. In other words, we have seen that the majority of men with OSAS are suffering from both overweight problem and erection failure.

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