Premature ejaculation in OSAS: does it improve with CPAP treatment?

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Abstract

Aim: We aimed to evaluate the association of premature ejaculation with OSAS and to assess the effects of continuous positive airway pressure (CPAP) therapy on premature ejaculation. Methods: Sexually active men between the ages of 20-50 who were newly diagnosed with PE, and diagnosed with OSAS were included in the study. Arabic Premature Ejaculation Index (AIPE) and Intravaginal Ejection Delay Time (IELT) were questioned for the diagnosis of PE. Patients with OSAS who accepted to participate in the study were given one year CPAP treatment, and AIPE and IELT were questioned again, after the treatment. Results: Epworth score was significantly lower in the control group compared with the OSAS groups. In the beginning, IELT and AIPE scores were significantly higher in the control group compared with the OSAS groups. At the end of the treatment, in both OSAS groups, both sores improved. Conclusion: For the first time in literature we determined that the presence of OSAS was associated with significantly worse IELT and AIPE scores in males with PE, and the treatment of OSAS was related to the significant improvement in both scores, in the absence of any specific treatments for PE. -What's already known? -The pathology of OSAS depends on repeated episodes of hypoxia during sleep that may result in cyclic changes in arterial oxygen saturation and increased production of reactive oxygen species. Higher prevalence of sexual dysfunction and erectile dysfunction was reported in OSAS patients. -What does this article add? -To the best of our knowledge first time in the literature we determined that the presence of OSAS was associated with significantly worse IELT and AIPE scores in males with PE, and the treatment of OSAS was related to the significant improvement in both scores, in the absence of any specific treatments for PE

INTRODUCTION

Premature ejaculation (PE) is a common problem in male sexual health that significantly affects quality of life. According to the definition of the International Society for Sexual Medicine revised by the American Psychiatric Association, PE is the inability to delay or control ejaculation, which consistently occurs before or within 1 minute of penetration (1). The situation is accompanied by feelings of disappointment, sadness, avoidance of sexual intimacy, and psychological distress for the individual and also causes problems in their personal relationships (2). In epidemiological studies, the worldwide prevalence of PE was found to be as high as 25–30% (3). Although it is one of the most common sexual disorders in men, its pathophysiology is not fully understood, resulting in a lack of adequate treatment options.

Obstructive sleep apnea syndrome (OSAS) is characterized by upper airway obstruction that causes repetitive pauses in breathing during sleep and leads to metabolic abnormalities. Patients with OSAS experience excessive daytime sleepiness that impairs cognitive functions, social activity, and quality of life. During episodes of OSAS, intermittent hypoxia is associated with an increase in oxidative stress and systemic inflammatory response (4,5). OSAS has been associated with some sexual disturbances in both genders in previous studies (6-8). However, literature data regarding the association between PE and OSAS are limited.

In this study, we aimed to evaluate the relationship between PE and moderate to severe OSAS and assess the effects of continuous positive airway pressure (CPAP) therapy on PE.

MATERIALS and METHODS

Sexually active men between the ages of 20 and 50 years who were diagnosed with PE within the last 3 months but not treated, presented to the sleep laboratory of Esrefpasa Metropolitan Municipality Hospital between January 2018 and June 2020, and were diagnosed as having moderate or severe OSAS were included in the study. Patients diagnosed as having mild OSAS were excluded. The control group consisted of men with PE who did not have OSAS (apnea-hypopnea index [AHI] < 5).

Patients with a history of urogenital system tumors, urogenital system surgery, neurogenic bladder, hypogonadism, kidney and liver failure, urethral stricture, bladder stones, overactive bladder, or chronic prostatitis were excluded from the study. In addition, patients with malnutrition and those using drugs that adversely affect libido and erectile function, such as antidepressants, were also excluded.

The study was approved by the local ethics committee and performed in accordance with the ethical standards set forth in the 1964 Declaration of Helsinki and later amendments. Informed consent was obtained from all participants.

For sleep analysis, we used standard 14-channel polysomnography, including electroencephalogram (C3-A2, C4-A1, O1-A2, O2-A1), electro-oculograms, electromyograms (EMG) of the left/right extremity, electrocardiogram (ECG), heart rate, nasal and oral air flow, thoracic and abdominal movements, registration of snoring, body position, oxygen saturation (SaO_2) monitored by pulse oximetry, and polysomnography with video monitoring. Apnea was defined as the cessation of airflow for at least 10 s. Hypopnea was defined as any reduction of airflow lasting at least 10 s and resulting in arousal or oxygen desaturation (>4% decrease in SaO_2).

Apnea-hypopnea index (AHI) was calculated as the number of apnea and hypopnea events per hour of total sleep time (9). OSAS was graded as mild (AHI=5–14), moderate (AHI=15–29), or severe (AHI[?]30). Only patients diagnosed with moderate or severe OSAS were included in the study; those with mild OSAS were excluded. Men with AHI below 5 were included in the control group.

At the start of the study, all participants' demographic features, height, weight, body mass index (BMI), chronic comorbid diseases, history of smoking and alcohol use, serum thyroid function test results, and total testosterone levels were determined. BMI was calculate as weight (kg) / height $(m)^2$.

The Arabic Index of Premature Ejaculation (AIPE) and intravaginal ejaculation latency time (IELT) were evaluated for the diagnosis of PE. An AIPE value less than 30 supports the diagnosis of PE (10). IELT was defined as the time from first penetration to ejaculation in seconds (11).

Indications for CPAP usage according to the American Academy of Sleep Medicine 2008 report were AHI [?]15 or AHI [?]5 plus the presence of major/obvious symptoms, cardiovascular or cerebrovascular risk factors (hypertension, stroke, excessive daytime sleepiness, ischemic heart disease, insomnia), and the existence of mental disorders (12). CPAP titration was done on another day for the patients in whom treatment was planned according to AHI score.

Patients with OSAS who agreed to participate in the study underwent 1 year of CPAP therapy, after which their AIPE and IELT were reevaluated. Similarly, AIPE and IELT were evaluated in the patients in the control group at 1-year follow-up. None of the patients in the control or study groups received additional treatment for PE during the study period.

Statistical Analyses

Data were analyzed using IBM SPSS Statistics version 21.0 (IBM Corp., Armonk, NY, USA) software. The data were tested for normal distribution using the Kolmogorov–Smirnov test. Comparison of two independent groups was performed with the independent samples t-test and Mann–Whitney U test. Categorical variables

were compared using chi-square tests. Categorical variables were expressed as number and percentage; quantitative variables were expressed as either mean ± standard deviation or median and interquartile range (IQR, 25^{th}–75^{th} percentile values). A statistical difference was taken as P <0.05.

RESULTS

In total, 80 control subjects without OSAS, 85 patients with moderate OSAS, and 82 patients with severe OSAS were included in the study. There were no significant differences between the groups in terms of age, BMI, or thyroid function test results (Table 1). Total testosterone level was significantly higher in the control group compared to both OSAS groups. This was not statistically significant for the moderate OSAS group, it was statistically significant for the severe OSAS group (p: 0.08, p: 0.001, respectively).

Table 1. General demographic features and laboratory data of study participants

	Control (n=80)	Moderate OSAS (n=85)	Severe OSAS (n=82)	p1	p2	p3
Age (years)	39.17±6.68	39.44±6.51	40.20±5.44	0.79	0.34	0.42
BMI (kg/m^2)	31.30±3.53	31.21±3.49	32.27±3.33	0.87	0.27	0.25
TSH (μIU/mL)	1.29±.39	1.27±0.36	1.37±0.41	0.71	0.24	0.11
FT4 (ng/dL)	1.13±0.14	1.09±.10	1.07±.09	0.46	0.22	0.64
FT3 (ng/dL)	3.68±0.31	3.65±0.25	3.71±0.39	0.78	0.54	0.42
Total Testosterone (pmol/L)	325.00±53.58	311.18±46.62	297.03±41.86	0.08	**0.001**	**0.04**

OSAS: Obstructive sleep apnea syndrome, BMI: Body mass index, TSH: Thyroid stimulating hormone, FT3: Free T3, FT4: Free T4

p1: Control vs. moderate OSAS; p2: Control vs. severe OSAS; p3: Moderate vs. severe OSAS. Statistically significant results shown in bold (p<0.05).

There was no difference between the groups in terms of smoking or alcohol use or the presence of hypertension, diabetes, or coronary artery disease; however, unemployment was more common in the OSAS groups compared to the control group (Table 2).

Table 2. General characteristics and comorbidities of the study participants

	Control (n=80)	Moderate OSAS (n=85)	Severe OSAS (n=82)	p
Smoking history	23 (28.7) 12 (15) 45 (56.25)	25 (29.4) 15 (17.6) 45 (52.9)	28 (34.1) 15 (18.3) 39 (4.5)	0.85
Never-smoker Ex-smoker Current smoker				
Alcohol use	8 (10)	7 (8.2)	12 (14.6)	0.43
Unemployed	2 (2.5)	10 (11.7)	9 (10.9)	**0.001**
Hypertension	18 (22.5)	21 (24.7)	18 (21.9)	0.90
Diabetes mellitus	9 (11.2)	10 (11.7)	11 (13.4)	0.91
Coronary artery disease	5 (6.2)	5 (5.8)	7 (8.5)	0.78

OSAS: Obstructive sleep apnea syndrome. Statistically significant results shown in bold (p<0.05)

Comparisons of initial and 1-year IELT and AIPE scores within and between the groups are shown in Table 3. Initial IELT and AIPE scores were significantly higher in the control group compared with the OSAS groups. Compared to initial (pre-treatment) values, both scores improved significantly in both OSAS groups

after 1 year of CPAP therapy.

Table 3. IELT and AIPE scores of OSAS patients before and after treatment compared to the control group

	Control (n=80)	Moderate OSAS (n=85)	Severe OSAS (n=82)	p1	p2	p3
Initial IELT (s)	155.63±98.78	96.23±60.60	62.86±40.49	**0.001**	**0.001**	**0.001**
1-year IELT (s)	161.88±98.88	134.17±83.43	112.25±71.58	0.06	**0.001**	0.07
p	0.46	**0.001**	**0.001**			
Initial AIPE	26.18±3.88	18.71±3.43	17.85±3.83	**0.001**	**0.001**	0.127
1-year AIPE	26.45±3.83	23.25±3.43	24.18±3.53	**0.001**	**0.001**	0.09
p	0.68	**0.001**	**0.001**			

IELT: Intravaginal ejaculation latency time, AIPE: Arabic Index of Premature Ejaculation, OSAS: Obstructive sleep apnea syndrome

p: Initial vs. 1-year results; p1: Control vs. moderate OSAS; p2: Control vs. severe OSAS; p3: Moderate vs. severe OSAS. Statistically significant results shown in bold ($p<0.05$)

DISCUSSION

In this study, we determined that in patients with PE, the presence of OSAS was associated with significantly worse IELT and AIPE scores, while the treatment of OSAS was associated with significant improvement in both scores, without any specific treatments for PE.

Though it is not a rare condition, the exact pathophysiological mechanisms underlying PE remain unclear. Several potential factors have been proposed, including anxiety and depression, 5-HT receptor dysfunction, genetic factors, thyroid diseases, and prostate inflammation (13-16).

To the best of our knowledge, this is the first study in the literature to demonstrate that OSAS was associated with more severe PE. The pathology of OSAS depends on repeated episodes of hypoxia during sleep that may result in cyclic changes in arterial oxygen saturation and increased production of reactive oxygen species (17,18). OSAS has been linked to sexual disturbances in previous studies. Higher prevalence of sexual dysfunction and erectile dysfunction was reported in OSAS patients (7,19). Matos et al. (20) reported increased serum concentration of tumor necrosis factor-alpha, which is an inflammatory marker, in association with erectile dysfunction in men with OSAS. Similarly, oxidative stress and systemic inflammation may play a role in the development of PE in OSAS patients. However, since we did not evaluate inflammatory or oxidative stress markers before or after treatment, we cannot draw any conclusions regarding the pathophysiological role of inflammation in PE among patients with OSAS.

Another important finding in this study was the improvement of IELT and AIPE scores in patients with moderate or severe OSAS after 1 year of CPAP therapy. Husnu et al. (22) reported a significant improvement in erectile dysfunction complaints in patients with OSAS after 3 months of regular CPAP usage. Similarly, Taskin et al. (23) also reported an improvement in erection function in OSAS patients with CPAP treatment. The significant improvement in IELT and AIPE scores after 1 year of CPAP therapy in our study support these findings and demonstrate the association between PE and OSAS. Although CPAP is not a direct treatment method for PE, our study showed that PE also improved with treatment of OSAS.

Some psychological factors and hormonal and inflammatory diseases were suggested to have important roles in the pathophysiological mechanisms of PE (13-16). In this study, unemployment was more common in OSAS groups, which may aggravate the psychological factors involved in PE. Moreover, we also determined that serum total testosterone levels were significantly lower in the OSAS groups, which may also play a role in shorter IELT and poorer AIPE scores. We did not observe any significant differences between the groups in terms of thyroid function tests.

There are some limitations to this study that should be mentioned. The data related to PE in this study were based on patient reports. Secondly, we did not evaluate the participants' Epworth sleepiness scale scores or serum testosterone levels at 1 year. Therefore, we could not assess the role of these factors in PE.

In conclusion, we determined that the presence of moderate or severe OSAS was associated with significantly worse IELT and AIPE scores in men with PE, and the treatment of OSAS was associated with significant improvement in both scores in the absence of any specific treatments for PE. Larger studies evaluating the pathophysiological mechanisms of PE in OSAS patients are warranted.

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