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INTRODUCTION

Background: Decreased levels of serum 25(OH)D, i.e., the best indicator of vitamin D supply to the body, have been reported both in OSA and COPD patients^{1,2}, while continuous positive airway pressure (CPAP) therapy has been shown to improve hypovitaminosis D³.

Aim: To evaluate the effect of CPAP treatment on serum 25(OH)D levels in patients with coexistent COPD-OSA overlap syndrome (OS).

METHODS

In consecutive OS patients (diagnosed with pulmonary function testing and polysomnography), serum 25(OH)D levels, Epworth sleepiness scale (ESS) score and COPD assessment test (CAT) score were measured at baseline and 12 months after CPAP treatment.

COPD diagnosis was based on symptoms and a post-bronchodilator FEV₁/FVC<0.7; while OSA was based on apnea-hypopnea index (AHI)≥5/h along with symptoms.

Compliance to treatment was assessed from the data retrieved from the CPAP device.

RESULTS

Overall, 46 patients (43 males, mean age 60.9 years, mean BMI 37.8±5.5 Kg/m², GOLD stage B 43.5%) were included and evaluated over a 12-month period (Table 1). Most of the patients (82.6%) had severe OSA (Table 2). After 12 months, most patients shifted from COPD GOLD stage B to stage A (Table 3).

After 12 months of treatment, an improvement was observed in apnea-hypopnea index (AHI) (from 41.1/h to 3.1/h, p<0.001), ESS score (from 9 to 3, p<0.001) and CAT score (from 9 to 5, p<0.001). In all patients, serum 25(OH)D levels increased after 12 months of CPAP (from 21.3±8.4 to 23.8±8.7 ng/ml, p=0.001) (Table 3, Figure 1). Those were higher in OS patients with good 12-month CPAP compliance compared to patients with poor compliance (25.8±7.6 versus 20.4±9.6 ng/ml, p = 0.038) (Figure 2).

CONCLUSION

In a sample of consecutive OS patients, good compliance to CPAP treatment was associated with improvement in several OSA and COPD parameters, as well as with an increase in serum 25(OH)D levels.

Table 1. Comparison of anthropometric characteristics of OS patients at baseline and after 12 months of CPAP treatment

Table 1.	OS patients (n=46)		
	Baseline	12 months	p
Gender (males/females)	43/3	43/3	-
Age (years)	60.9 ± 9.1	61.9 ± 9.1	0.998
Neck circumference (cm)	46.7 ± 3.6	45.2 ± 7.6	0.195
Waist circumference (cm)	128 ± 11.9	125.7 ± 17.3	0.234
Hip circumference (cm)	119.3 ± 12.7	120.6 ± 14.3	0.272
WHR	0.96 ± 0.13	1.06 ± 0.15	<0.001
BMI (kg/m ²)	37.8 ± 5.5	36.4 ± 8.1	0.128
COPD GOLD stage (n/%)			
A	14 (30.4)	27 (61.4)	<0.001
B	20 (43.5)	14 (31.8)	0.180
D	12 (26.1)	3 (6.8)	0.022

Table 2. Sleep parameters of OS patients at baseline

Table 2.	OS patients (n=46)
AHI (events/h)	41.1 (26.1 – 62.6)
Aver SaO ₂ (%)	91 (87 – 92)
Min SaO ₂ (%)	74 (64– 77)
T <90% (%)	25.8 (9.4 – 49.1)
OSA n (%)	
Moderate	8 (17.4)
Severe	38 (82.6)
ESS score	9 (6 – 15)

Table 3. Pulmonary function parameters of OS patients at baseline and after 12 months of CPAP treatment

Table 3.	OS patients (n=46)		
	Baseline	12 months	p
FEV ₁ (% predicted)	67.8 ± 18.8	72 ± 18.4	0.097
FVC (% predicted)	80 ± 20.6	86.1 ± 21.2	0.018
FEV ₁ /FVC (%)	66.3 ± 5	66.4 ± 5.2	0.796
GOLD airflow limitation stage (n/%)			
1	10 (21.7)	15 (34.1)	0.267
2	29 (63)	25 (56.8)	0.424
3	4 (8.7)	3 (6.8)	0.998
4	3 (6.5)	1 (2.3)	0.500
CAT score	9 (6 – 11)	5 (2 – 8)	<0.001

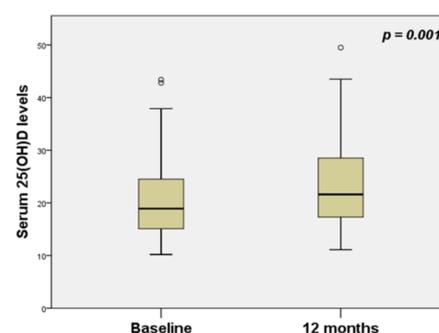


Figure 1. Comparison of 25(OH)D levels at baseline and after 12 months of CPAP treatment.

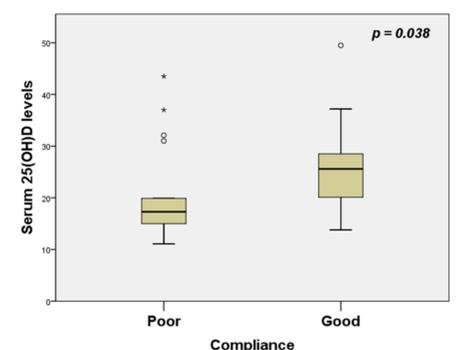


Figure 2. Comparison of 25(OH)D serum levels between patients with poor and good CPAP compliance after 12 months of treatment.

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