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FEATURES OF THE COURSE OF SLEEP APNEA SYNDROME IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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Abstract. Over the past 10 years, the incidence of chronic bronchopulmonary pathology has increased by 21% in relation to the total incidence, while chronic obstructive pulmonary disease is the most common pathology among respiratory diseases. The combination of chronic obstructive pulmonary disease (COPD) and obstructive sleep apnea syndrome (OSAS), the so-called overlap syndrome, is a state of mutual aggravation. The prevalence of overlap syndrome among COPD patients is estimated at 2%, and among patients with OSAS - at 10% (1,2). In this regard, COPD patients with suspected OSAS should definitely undergo polysomnography and, if necessary, prescribe appropriate treatment

Keywords: chronic obstructive pulmonary disease, obstructive sleep apnea syndrome, respiratory arrest, respiratory function.

Relevance. The World Health Organization (WHO) classifies COPD as a disease with a high level of socio-economic burden for society, patients and their families, this is due to high rates of mortality and disability of patients of working age, [3,5,6], as it has a steadily progressive course with an outcome in chronic respiratory failure and the development of a chronic pulmonary heart [4,7,9].

The combination of chronic obstructive pulmonary disease (COPD) and obstructive sleep apnea syndrome (OSAS), the so-called overlap syndrome, is a state of mutual aggravation. The prevalence of crossover syndrome among people with COPD is estimated at 2%, and among patients with OSAS – at 10% [1,2,8]. In this regard, COPD patients with suspected OSAS should definitely undergo polysomnography and, if necessary, prescribe appropriate treatment. [10,11].

The aim of this study was to analyze the frequency and severity of OSAS in patients with chronic obstructive pulmonary disease (COPD) and metabolic syndrome (MS).

Material and methods. 112 patients with COPD and MS aged 40 to 75 years (60 men and 52 women) were examined. The average age of men was 56.5, women - 57.5 years. Criteria for inclusion in the study: age over 40 years, the presence of post-dilation parameters of respiratory function and clinical manifestations of respiratory disorders during sleep (snoring, daytime drowsiness, respiratory arrest during sleep). The Epfort sleepiness scale was used, specially adapted for the primary detection of patients at risk of OSAS. All patients underwent rheoencephalographic examination (REG) in order to detect the presence of a violation of venous outflow in the examined patients, calculation of body mass index (BMI). $BMI = \text{body weight (kg)} / \text{height (m)}^2$

The results of the study. According to the criteria of GOLD (2011), COPD of the middle stage was diagnosed in 78 cases, severe in 66 cases. Category B was determined in 18 patients (all cases of moderate airflow restriction), category C – in 30 patients (24 – moderate, 6 – severe airflow restriction), category D – in 10 patients (all cases of severe airflow restriction).

Concomitant cardiovascular diseases (ischemic heart disease and arterial hypertension) were present in 72 patients (69.6%). Signs of venous cerebral dyscirculation (VCD) were present in 61.4% of the subjects. The vast majority of the surveyed had an increased body weight: body mass index (BMI) was less than 25 kg/m² in only 14 people (12.5%), in 22 people (19.6%) – from 25 to 29 kg/m² (I degree of obesity), in 46 people (41.1%) – from 30 to 40 kg/m² (II degree of obesity) and in 36 people (32.1%) – more than 40 kg/m² (III degree of obesity). Statistical processing of the data obtained was carried out using nonparametric and parametric criteria. OSAS was confirmed in 42 patients (37.5%), in 22 cases only the syndrome of night snoring without stopping breathing and a drop in the level of oxygen saturation of blood hemoglobin was recorded (Table 1).

The degree of OSAS in patients with COPD and MS

| | | Group of patients OSAS, n=42 | | | | | | | | Group of patients without OSAS, n=35 | |
|---------|-----------------------|------------------------------|--------|---------------|--------|---------------|--------|-------|--------|--------------------------------------|--------|
| | | Mild degree | | Medium degree | | Severe degree | | Total | | 35 | % |
| | | n=6 | % | n=22 | % | n=14 | % | n=42 | % | n=35 | % |
| COPD | Middle degree gravity | 6 | 14,30% | 8 | 19,00% | 0 | 0,00% | 14 | 33,3% | 50 | 71,40% |
| | Severe degree | 0 | 0,00% | 14 | 33,3% | 14 | 33,30% | 32 | 76,20% | 6 | 8,60% |
| Obesity | 1 dg | 4 | 66,70% | 4 | 18,20% | 0 | 0,00% | 8 | 19,00% | 6 | 8,60% |
| | 2 dg | 2 | 33,30% | 10 | 45,50% | 6 | 42,90% | 18 | 42,90% | 10 | 14,30% |
| | 3 dg | 0 | 0,00% | 8 | 36,40% | 4 | 57,10% | 16 | 38,10% | 4 | 5,70% |

Among patients with only snoring without apnea, COPD of the middle stage was determined in 16, severe – in 6 cases: category B – in 16, category C – in 4, category D – in 2 patients. The average volume of forced exhalation for 1 second here was 51.3±8.2% of the required, concomitant cardiovascular diseases were present in 6 people, BMI was on average 26.1±2.9 kg/m².

Mild OSAS was recorded in 6 people, the average number of respiratory disorders per night was 50.1±12.1, of which obstructive apnea was 11.7±2.4. The average duration of obstructive apnea was 26.4±4.1 s, the average minimum saturation of blood hemoglobin with oxygen was 84.1±10.3%, the average saturation was 97.4±9.6%. COPD of the middle stage was determined in all patients of this group, category B –

y, category 2 C – y 4. The average volume of forced exhalation for 1st C was $41.2 \pm 6.5\%$ of the due. Concomitant cardiovascular diseases were present in 8 people. The average BMI was $33.8 \pm 2.8 \text{ kg/m}^2$ (grade II obesity in 4 patients) (Table 1).

Moderate OSAS was recorded in 22 patients (including 14 men): the average number of respiratory disorders per night was 140.4 ± 25.1 , of which obstructive apnea – 46.2 ± 6.7 , obstructive hypopnea – 91.4 ± 9.8 , central apnea – 2.8 ± 0.5 . The average duration of obstructive apnea was $41.5 \pm 6.3 \text{ s}$, the average the minimum saturation of blood hemoglobin with oxygen was $80.2 \pm 9.8\%$, the average saturation was $91.4 \pm 8.6\%$. COPD of the middle stage was determined in 8, severe – in 14 patients: category B – in 6, category C – in 10, category D – in 6 patients. The average volume of forced exhalation for the 1st second was $43.2 \pm 9.2\%$ of the due. Concomitant cardiovascular diseases were present in 14 people. Symptoms of venous cerebral encephalopathy were observed in this group in 72.7% of cases. The average BMI was $33.4 \pm 4.1 \text{ kg/m}^2$ (obesity of the I degree – in 10, obesity of the II degree – in 8, obesity of the III degree – in 4 people).

Severe OSAS was recorded in 14 people (including 6 men): the average number of respiratory disorders per night was 415.0 ± 31.5 , of which obstructive apnea – 270.6 ± 24.5 , obstructive hypopnea – 134.0 ± 13.7 , central apnea – 10.4 ± 1.8 . The average duration of obstructive apnea was $58.9 \pm 8.9 \text{ s}$, the average the minimum saturation of blood hemoglobin with oxygen was $66.9 \pm 5.6\%$, the average saturation was $87.0 \pm 10.4\%$ (and the minimum saturation level was 50%). Severe COPD was determined in all patients of this group; category B is not registered, category C was determined – in 6, category D – in 8 patients. The average volume of forced exhalation for 1 s was $39.2 \pm 6.9\%$ of the required. Concomitant cardiovascular diseases were present in all patients. In this group, all patients had venous encephalopathy. The average BMI was $41.84 \pm 6.2 \text{ kg/m}^2$, and all patients were obese (grade II – in 14 people) (Table 1).

It was found that signs of venous cerebral dysgemia and obesity were significantly more common in the group of patients with moderate to severe OSAS compared with the group of patients where CAOS was not detected (Fig.1).

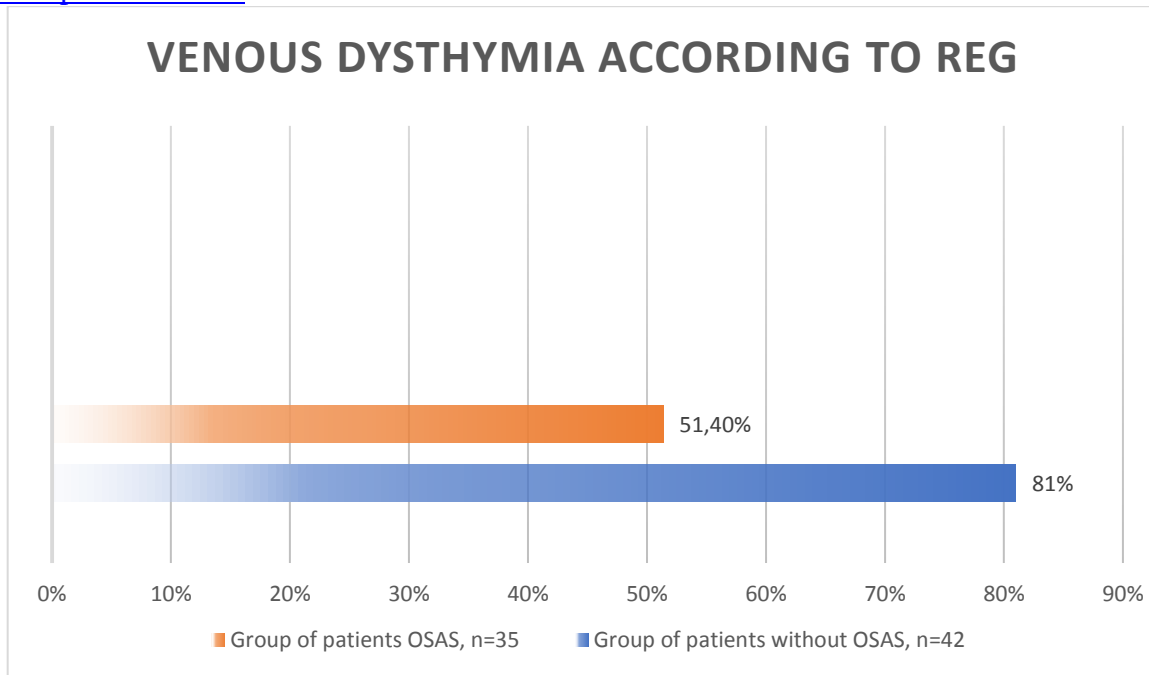


Figure 1. The proportion of patients with venous dysthymia in groups.

Note: *-confidence between groups $p < 0.05$.

There was no significant difference in the average indicators of forced expiratory volume for 1- s with varying severity of OSAS and a significant correlation between this indicator and the frequency of apnea. However, similar comparisons with BMI values showed a significant direct correlation with the severity of OSAS, as well as a significant correlation between BMI and the amount of apnea ($r=0.7$) and the level of oxygen saturation of blood hemoglobin ($r = -0.6$). Apparently, the degree of obesity is pathogenetically more important in the occurrence of OSAS than the degree of obstruction of the lower respiratory tract. The high frequency of OSAS in COPD patients with increased body weight is probably a feature of the so-called phenotype of COPD with obesity.

Based on the above, it can be concluded that OSAS is one of the important mechanisms that aggravate the course of COPD, especially in people with increased body weight, and requires mandatory correction of the patency of the upper respiratory tract with CPAP therapy. Individuals with OSAS are also characterized by the formation of venous cerebral dysthymia, which significantly aggravates the course of the underlying disease, increases hypoxemia. To leveling neurological symptoms in patients with COPD, in particular in patients with OSAS, it is necessary to prescribe a course of venotonic drugs.

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