

Evaluation of nutritional status in patients with COPD

Streszczenie w języku angielskim

Objectives. This study aimed at evaluating and comparing nutritional status, respiratory system function, diet, and quality of life in the patients with Chronic Obstructive Pulmonary Disease (COPD) and Systemic Sclerosis (SSc).

Material and Methods. Hundred forty eight patients (50 women and 98 men) with stable COPD and 32 patients with SSc were examined. The group of the COPD patients included 110 individuals chronically treated with oxygen at home, so-called HOT subgroup – Home Oxygen Therapy –and 38 patients, who were no HOT subgroup.

Anthropometric measurements were made and body composition was evaluated with the aid of electric impedance (BIA). Body mass index (BMI) and fat free mass index (FFMI) were calculated.

Body mass index served to divide the patients into the following groups: malnutrition (<20 kg/m²), normal body mass ($20 - 24.9$ kg/m²), and obesity (≥ 30 kg/m²). Spirometry and gasometry of the arterial blood were performed. Grip strength was measured with manual spring dynamometer of Baseline. The life quality of the patients with COPD was assessed with St. George's Respiratory Questionnaire (SGRQ) and the patients with SSC with questionnaire SSCQLI.

The diet of the examined patients was evaluated with the aid of a 3-day notebook and the original author's questionnaire concerning nutritional behavior and diet.

Results. In the group of COPD patients, normal body weight was found in 28.4% of patients, overweight in 28.4%, obesity in 36.5%, and malnutrition in 6.7% of patients. In the group of patients with SSC, normal body weight had 59.4% of them, overweight in 31.5%, 1 patient was obese, and in 2 patients malnutrition was seen. In both groups, difference in BMI value was statistically significant ($p=0.0008$).

In the HOT subgroup, malnutrition was the most frequent nutritional disorder expressed by BMI value was obesity, which was seen in 34.5%, overweight in 29.3%, normal body weight in 28.4%, and malnutrition in 7.5% of patients. In the no HOT subgroup, obesity was also the most frequent nutritional disorder diagnosed in 42.1%, malnutrition was seen in one patient, while the normal body weight in 28.9%, and overweight in 26.3% of patients. Grip strength was statistically significantly lower in the HOT subgroup in comparison with no HOT subgroup (24.7 ± 9.7 vs 29.4 ± 10.6 ; $p=0.02$). Patients with COPD were characterized by statistically significantly lower FEV₁ values in comparison with the patients with SSC ($43.1 \pm 18.2\%$ normal

value vs $86.8 \pm 21.2\%$; $p < 0.0001$). A statistically significant relationship between the BMI range and the FEV₁ % N value (Kruskal-Wallis test: $H=14.542$; $p=0.0023$) was observed in COPD patients. The lowest mean FEV₁%N values were found in COPD patients with BMI <20, the highest values in patients with BMI <30. In case of patients treated with oxygen at home (HOT) and not treated with oxygen (no HOT), FEV₁ values were significantly lower in HOT patients ($40.9 \pm 18.2\%$ normal value vs $49.4 \pm 16.3\%$ normal value; $p=0.005$).

Mean score of the quality of life in the patients with COPD was 66.2 ± 17.6 while in patients with SSC – 38.2 ± 26.5 . The value of SGRO questionnaire in the group of patients with COPD, subgroup HOT, was significantly higher than that in the subgroup no HOT (68.5 ± 16.6 vs 59.7 ± 18.6 ; $p=0.02$).

Calcium, vitamin D, and folate intake was lower than reference daily intake in over 75% of patients with COPD and SSC.

Mean intake of vitamins A, E, and C was statistically significantly higher in the no HOT subgroup in comparison with patients in HOT subgroup ($15005.2 \pm 2253.7 \mu\text{g/d}$ vs $718.3 \pm 608.5 \mu\text{g}$; $p=0.03$), ($8,776.9 \pm 4.5 \text{ mg/d}$ vs $6.9 \pm 4.5 \text{ mg/d}$; $p=0.03$), and ($86.4 \pm 78.7 \text{ mg}$ vs $53.34 \pm 57.8 \text{ mg/d}$; $p=0.03$), respectively. Mean vitamin A was lower than the reference daily intake in 60.9% of the HOT subgroup patients and 34.2% of the no HOT subgroup patients. Mean daily vitamin E intake was lower than reference daily intake in 72.4% of the HOT subgroup patients and 58.3% of the no HOT subgroup patients. Mean daily vitamin C intake was lower than reference daily intake in 78.2% of the HOT subgroup patients and 62.5% of the no HOT subgroup patients.

Conclusions. 1. Nutritional disorders are more frequent in the COPD patients in comparison with SSC patients. The most frequent nutritional disorder in the patients with COPD was obesity, while in SSC patients – overweight. 2. Malnutrition is more frequently seen in the COPD patients treated with oxygen at home in comparison with those in no HOT subgroup. 3. Respiratory tract function was significantly better in the obese COPD patients and worse in those with malnutrition. 4. Quality of life was significantly worse in the COPD patients treated with oxygen at home than those not treated with oxygen. 5. Erroneously composed diet was characteristic for both the COPD and SSC patients, while higher abnormality in the quantity of the nutritional components was found in the COPD patient only.