

Abstract

Introduction: Chronic obstructive pulmonary disease (COPD) is characterised by respiratory symptoms which lead to airflow being limited in the respiratory tract. The main pulmonary symptoms are cough, shortness of breath, sputum production and/or exacerbations, as well as deterioration of physical tolerance and increased respiratory load. Depending on the experienced dyspnoea, assessment of symptom severity and number of exacerbations in COPD, three degrees of its severity can be distinguished: A, B and E. COPD is not only a lung disease, but also one that is systemic. The most common extra-pulmonary symptoms include: body composition disorders, loss of muscle mass and strength, osteoporosis, depression, frailty syndrome, diabetes and cardiovascular diseases. Patients are at risk of atherosclerosis, ischaemic heart disease, heart attack or stroke. Due to weakening of the respiratory muscles, respiratory function is reduced. Furthermore, limitation of diaphragm function can lead to breathing problems, shortness of breath, fatigue or excessive daytime sleepiness. COPD treatment includes that (non-)/pharmacological and surgical, the basic component of which is physiotherapy. Cycling and/or walking training, sets of breathing exercises, techniques facilitating the evacuation of secretions and general rehabilitation exercises are among standard physiotherapy protocols.

Aim: The aim of the study was to assess the effect of manual therapy on the diaphragm and deep trunk muscle exercises with regard to selected spirometric variables, diaphragm mobility and exercise tolerance level in patients with COPD.

Methods and research material: The study was conducted at the Małopolska Hospital of Lung Diseases and Rehabilitation in Jarosław. It included an interview, assessment of COPD impact on the patient's functioning using the CAT questionnaire (COPD Assessment Test), dyspnoea intensity via the mMRC scale (modified Medical Research Council), exercise tolerance using the Six-Minute Walk Test, dyspnoea and fatigue implementing the Borg scale, as well as spirometric and spine stabilisation, diaphragm mobility and respiratory muscle strength examinations. Patients of the pulmonary department diagnosed with chronic obstructive pulmonary disease were qualified for the study. A total of 60 individuals were divided into two groups, comprising the experimental study group and the control. Patients from the study group, in addition to standard respiratory physiotherapy, also underwent manual therapy. The control group participants were subjected to therapy according to the programme used at the hospital pulmonary department (standard rehabilitation).

Results: The study involved 18 women and 42 men. The average age of the study participants was 63.28 ± 7.91 years. The group of patients qualified for the study was characterised by advanced COPD, with numerous symptoms (shortness of breath, fatigue, desaturation) and low to moderate physical tolerance. After the therapy, in the assessment of disease severity using the CAT questionnaire, statistically significant improvement was obtained in the study group ($p < 0.001$). The greatest impact of manual therapy was noted for reduction of pressure felt in the chest ($p = 0.031$) and shortness of breath when walking uphill ($p = 0.009$), improving sleep quality ($p = 0.003$) and increasing subjective sense of energy ($p = 0.002$). In addition, the group with manual therapy achieved significant improvement in spine stabilisation, reduced spine pain ($p < 0.001$) and increased diaphragm mobility ($p = 0.015$). In the case of the remaining variables under assessment, i.e. distance covered during the Six-Minute Walk Test, heart rate, saturation, experienced shortness of breath assessed using the mMRC questionnaire, spirometric variables, respiratory muscle strength, MET energy expenditure, BODE and feeling of fatigue as well as shortness of breath according to the Borg scale, no statistically significant differences were observed between the groups. However, improvement was achieved for all of the measured variables.

Conclusions: Manual therapy can be a valuable and beneficial form of physiotherapy, especially in cases for which improvement cannot be achieved with standard physiotherapy (also due to a number of organisational and equipment restrictions, etc.). Manual therapy and spine stabilisation exercises have significant impact on reducing the severity of COPD and spine pain.

Keywords

Chronic obstructive pulmonary disease, diaphragm, spine stabilisation, spirometry, respiratory muscle strength, Six-Minute Walk Test