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ACUTE EFFECT OF INSPIRATORY MUSCLE TRAINING ON THE PERIPHERAL MUSCLE OXYGEN DESATURATION RATE IN PATIENTS WITH COPD: A CASE SERIES

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Background: Chronic Obstructive Pulmonary Disease (COPD) is characterized by prolonged airflow obstruction due to tobacco exposure and environmental factors, making it one of the leading causes of mortality worldwide. In addition to respiratory complications, the disease promotes alterations in the cardiovascular system and peripheral muscle metabolism, contributing to exercise intolerance. In this context, Inspiratory Muscle Training (IMT) emerges as a strategy to enhance exercise tolerance and may influence the modulation of the metaboreflex during IMT application. However, the acute effects of IMT on the peripheral muscle metabolism of individuals with COPD remain poorly understood. Near-infrared spectroscopy (NIRS) is an effective method for analyzing the oxidative capacity of peripheral muscles.
Objectives: To analyze the acute effect of IMT, with different pressure loads, on the peripheral oxygen desaturation rate in patients with COPD. METHODS: This crossover case series followed five individuals diagnosed with COPD. They underwent two IMT protocols: one strength-focused protocol (IMT-F), using 60% of the patient's maximal inspiratory pressure, and a Sham IMT protocol. During training, tissue oxygenation behavior was measured using near-infrared spectroscopy on the gastrocnemius muscle. The study included individuals capable of performing the IMT protocol and/or functional tests, who had no associated comorbidities such as psychiatric disorders, cognitive impairments, progressive neurological disorders, chronic pain, or an inability to follow commands. Participants who wished to discontinue their participation during the protocol execution or failed to comply with the protocol were excluded. Before participation, all individuals signed an informed consent form.
Results: All participants showed greater desaturation in the IMT-F group compared to the Sham IMT group. The mean peripheral oxygen desaturation rate was higher in the IMT-F condition (-0.0184 $\pm$ 0.0210) compared to the Sham IMT (-0.0137 $\pm$ 0.0080). CONCLUSION: The results suggest a tendency for greater peripheral oxygen desaturation when patients are exposed to IMT-F. This condition may be explained by various physiological factors present in COPD patients that affect oxygenation and metabolic demand during intense effort. We believe that IMT-F requires more intense contractions of the inspiratory muscles, leading to increased oxygen consumption in this structure, indicating earlier activation of the metaboreflex. This mechanism redirects peripheral blood flow to the inspiratory muscles engaged in activity, potentially being a key factor in the reduction of peripheral tissue oxygenation during this type of training.
Implications: This study may contribute to a better understanding of the acute effects of IMT on peripheral tissue oxygenation behavior in COPD patients and may serve as a guide for the development of more effective respiratory rehabilitation protocols for these individuals.
Keywords: COPD, Oxygen Saturation, Strength Training

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PREVALENCE OF SARCOPENIA AND CLINICAL PROFILE OF INDIVIDUALS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) UNDERGOING OUTPATIENT PNEUMOLOGY CARE

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Background: Chronic Obstructive Pulmonary Disease (COPD) is a condition characterized by persistent respiratory symptoms and a partially irreversible limitation of airflow. Patients with COPD are more predisposed to sarcopenia, which is defined as the progressive loss of muscle mass, strength, and physical performance. The coexistence of these conditions results in an unfavorable clinical prognosis, with worse quality of life, increased frequency of exacerbations, and higher mortality.
Objectives: To describe the clinical profile of COPD patients under outpatient care and identify the prevalence of sarcopenia in this population.
Methods: This was a cross-sectional study conducted with patients diagnosed with COPD based on spirometry showing a FEV1/FVC ratio < 0.7, treated in an outpatient pneumology service. Patients aged between 40 and 90 years of both sexes, with no history of using cardiac electronic devices, were included. The diagnosis of sarcopenia was established through the evaluation of appendicular muscle mass using bioimpedance. Descriptive statistical analysis was used to characterize the variables of interest.
Results: The sample consisted of 65 patients, with a predominance of females (55.4%). The mean age was 67.1 $\pm$ 8.5 years. Regarding educational level, 75.4% of patients had completed most primary education. A history of exacerbation was reported by 56.9% of participants. Approximately 26.2% required hospitalization, with 16.9% having one hospitalization, 3.1% having two, and 6.2% having three hospitalizations. The majority of patients were former smokers (67.7%), while 32.3% were still active smokers. Regarding Body Mass Index (BMI), 44.6% had normal weight, 16.9% were underweight, 16.9% were overweight, and 21.5% had some degree of obesity. Hypertension was observed in 55.4% of patients, and Diabetes Mellitus in 7.7%. According to the severity of COPD, as per the Global Initiative for Chronic Obstructive Lung Disease (GOLD) criteria, 32.3% had moderate obstruction, 44.6% had severe obstruction, and 3.1% had very severe obstruction. According to the GOLD classification, which combines exacerbation history and symptoms, most patients were classified as GOLD B (44.6%) or GOLD E (43.1%), while 12.3% were classified as GOLD A. Sarcopenia was diagnosed in 28 patients (43.1%).
Conclusion: The predominant clinical profile in this sample consisted of female patients, mostly elderly, with a history of exacerbations but without the need for hospitalization. The most prevalent

comorbidity was systemic arterial hypertension, with primary school education, former smokers, normal BMI, and severe COPD obstruction (GOLD B). The prevalence of sarcopenia was high, observed in 43.1% of the sample.
Implications: The early identification of sarcopenia, along with recognition of the clinical characteristics of COPD patients, can guide evidence-based clinical decisions, favoring appropriate management of these conditions. Early diagnosis of sarcopenia may be crucial for implementing therapeutic and preventive interventions, contributing to a better prognosis for this population.
Keywords: Sarcopenia, COPD, Prevalence Ratio

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ANALYZING DISABILITY IN PATIENTS WITH INTERSTITIAL LUNG DISEASES THROUGH THE INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY, AND HEALTH FRAMEWORK

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Background: Interstitial lung diseases (ILDs) lead to activity limitations and participation restrictions, often resulting in disability. Disability should be assessed using the biopsychosocial model of the International Classification of Functioning, Disability, and Health (ICF), as recommended by the WHO.
Objective: To correlate the ICF domains to explore how bodily functions are associated with activity limitations and participation restrictions in patients with ILD.
Methods: A cross-sectional observational study involving patients with ILD, diagnosed according to the guidelines of the American Thoracic Society (ATS) and the European Respiratory Society (ERS), who had a stable clinical condition for at least three months. Pulmonary function was assessed using spirometry and respiratory muscle strength; activity was measured through the Incremental Shuttle Walk Test (ISWT) and the Six-Minute Walk Test (6MWT); and participation was evaluated using the Saint George's Respiratory Questionnaire (SGRQ).
Results: Of the 25 patients, the majority were men aged over 60 years, and it was observed a positive and moderate correlation ($r = 0.45$; $p < 0.05$) was found between activity and pulmonary function. However, the 6MWT showed a negative and moderate correlation with dyspnea ($r = -0.52$; $p = 0.007$). The participation component (SGRQ) did not show a significant association with the other components.
Conclusion: A significant relationship was found between the activity component and body functions, whereas participation was not linked to these components. This suggests that restrictions in participation are multifactorial, necessitating a comprehensive approach that goes beyond the traditional biomedical model and includes contextual factors.
Implications: These findings emphasize the need for a biopsychosocial approach in rehabilitation, addressing not only physical function but also social and environmental barriers. Personalized interventions incorporating psychological and social support are essential to effectively enhance participation and patient outcomes.
Keywords: Interstitial lung disease, Disability, International Classification of Functioning, Disability and Health (ICF), Biopsychosocial Model

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ADAPTATION, FEASIBILITY AND REPRODUCIBILITY OF THE MODIFIED SHUTTLE TEST FOR PEOPLE WITH DEAFNESS

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Background: Hearing loss may be associated with lower levels of physical activity, fragmentation of active time, and greater difficulties in performing activities of daily living. However, there are no records of validated exercise tests for the physical assessment of people with deafness, which are crucial for prescribing interventions and monitoring physiological and functional responses. Among these, the Cardiopulmonary Exercise Test (CPET) stands out as the gold standard for assessing physical fitness and limiting symptoms. However, CPET requires expensive equipment, highly trained personnel, and standard laboratory conditions, which limits its wide availability to the general population. On the other hand, the Modified Shuttle Test (MST) is a progressive, standardized, incremental test that is simple to perform in non-laboratory conditions. However, the MST uses auditory stimuli to guide participants, making it unfeasible for people with severe hearing loss or deafness.
Objectives: The central objective of this study was to develop an adaptation of the MST guided by visual cues. Secondarily, we intend to test the validity and agreement of the visual TSM.
Methods: This is a cross-sectional study, divided into two phases. Phase I includes the development of resources for adapting the TSM, using visual guidance to replace the audible commands of the conventional test. LED (Light Emitting Diode) RGB (Red Green Blue) light signals were used, positioned above each cone, located at the ends of the path. In this phase, the test will be tested on healthy individuals and its agreement, determined by paired t-test, analysis of the intraclass correlation coefficient (ICC) and 95% confidence intervals (CI) and Spearman's correlation coefficient. In Phase II, the feasibility and reproducibility of the adapted TSM in deaf individuals will be tested.
Results: An agreement analysis of partial data from Phase I was performed using the ICC (intraclass correlation coefficient) between the auditory SST and the visual SST in hearing individuals, considering the peak HR ($n = 8$) $170,7 \pm 15.8$ vs $169,4 \pm 11,0$bpm ($p > 0,05$) and the distance covered in the tests ($n = 10$) $999,0 \pm 44,3$ vs $987,0 \pm 53,1$ meters ($p > 0,05$), respectively. The partial results demonstrate an agreement between the tests for HR with ICC = 0,81 (95% CI = 0,39—0,93) and for distance covered ICC = 0.85 (95% CI = 0,46—0,96). The correlation between the HRpeak of the tests was $r = 0,68$, and between the distances it was $r = 0,76$ ($p < 0,05$ for both).