Methods: This is a cross-sectional study conducted with elderly smokers of conventional cigarettes who had been smoking for at least one year, of both sexes, aged 60 years or older, capable of walking without assistance, and understanding the instructions for tests and questionnaires. Body composition was measured with tetrapolar bioimpedance and cardiorespiratory capacity through the cardiopulmonary exercise test (CPET) using ramp protocol. Statistical analysis was performed using Jamovi 2.6.26 software. Linear regression was conducted to analyze the associations between variables, with a significant level of $p < 0.05$.
Results: Eight individuals (62.5% males, 66.2 ± 14.3) years presents body max index of 26.5 ± 3.6 kg/m^2. The average smoking duration was 47.3250 ± 6.923 years, and the average tobacco load was 34.700 ± 29.5477 packs/year. In body composition and CPET assessments, the phase angle was 5.775 ± 0.465, which is considered borderline for this population and may indicate compromised cellular integrity due to smoking. The FVC was 2.751 ± 0.706 liters, and the relative VO_2 peak was 20.913 ± 5.515 ml/min/kg. Linear regression analysis indicated that smoking duration was associated with a reduction in relative VO_2 peak (ß = -0.613; 95% CI: -1.408 to -0.131; p = 0.026), explaining 59% of the VO_2 peak variation (R^2 = 0.592). There was no statistically significant association between smoking duration and phase angle (p = 0.996) or FVC (p = 0.924).
Conclusion: Smoking duration was inversely associated with VO_2 peak, suggesting a negative impact of chronic smoking on cardiorespiratory capacity. Although no significant association was found with phase angle, the observed values indicate a possible compromise of cellular integrity. Studies with larger samples and considering other outcomes, such as body composition, may provide a deeper understanding of the mechanisms by which smoking affects the functionality of elderly individuals.
Implications: Cardiorespiratory decline is associated with a higher risk of morbidity and mortality in the elderly. Therefore, cessation strategies should be initiated early and associated with cardiorespiratory rehabilitation programs. These findings highlight the importance of monitoring functional capacity in elderly smokers.
Keywords: Aged, Cardiorespiratory Fitness, Smoking

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TRANSCRANIAL NEUROSTIMULATION AND AEROBIC EXERCISE IN FUNCTIONAL CAPACITY, MUSCLE METABOLISM, AND QUALITY OF LIFE OF INDIVIDUALS WITH PERIPHERAL ARTERIAL DISEASE

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Background: Peripheral arterial disease (PAD), commonly caused by atherosclerosis, reduces blood flow to the extremities, resulting in muscle ischemia and intermittent claudication. Aerobic training is an effective strategy for treating individuals with PAD, and high-definition transcranial direct current stimulation (HD-tDCS) has been studied as an adjunct therapy due to its positive effects on exercise endurance, perceived effort, and functional capacity (FC).
Objectives: To identify the effects of combining aerobic exercise and transcranial neurostimulation on quality of life (QoL), FC, peripheral muscle metabolism, and subjective perception of effort in individuals with PAD.
Methods: This case study was conducted with four volunteers diagnosed with PAD. FC was assessed using the Incremental Shuttle Walking Test (ISWT), muscle metabolism through Near-Infrared Spectroscopy (NIRS), QoL using the Short Form 36 (SF-36), and subjective perception of effort through the Modified Borg Scale. Assessments were conducted before and after 12 weeks of intervention. Participants were divided into two groups: the intervention group (IG) and the control group (CG), with two volunteers in each. The IG received active stimulation on the left dorsolateral prefrontal cortex (DLPFC-L) during exercise on a cycle ergometer, while the CG received placebo stimulation, both for 30 minutes.
Results: Regarding QoL, only the two IG participants were reassessed, as the CG participants declined to participate in the reassessment. An improvement in QoL was observed in Volunteer 1 (V1) in the following domains: general health perception (55/100), vitality (95/100), social function (100/100), and mental health (92/100); and in Volunteer 2 (V2) in the domains of physical functioning (60/100), emotional role limitation (67/100), bodily pain (68/100), general health perception (70/100), and mental health (80/100). In terms of subjective perception of effort, both volunteers reported an effort level of "too light" (Borg = 1) at the beginning, end, and recovery phases of the exercise test. FC showed a clinically significant minimal difference in three cases (?V2 = 500m; ?V3 = 110m; ?V4 = 70m). No significant differences were observed between the CG and IG regarding improvements in muscle metabolism after the intervention, except for resistance time (?V1 = 31.6s; ?V2 = 225.2s; ?V3 = 26.4s; ?V4 = 101.6s) in both the occlusion maneuver and the ISWT and lower-limb cycle ergometer tests.
Conclusion: The combination of HD-tDCS and aerobic exercise may contribute to increased QoL and FC in individuals with PAD. Additionally, an improvement in subjective perception of effort and walking distance in the ISWT was observed in the IG. However, no significant changes were noted in tissue oxygenation behavior.
Implications: These findings highlight the need for further robust studies and emphasize the importance of additional research on HD-tDCS as an adjunct therapy for PAD treatment, aiming for its integration into clinical practice. Despite limitations, this intervention may contribute to symptom mitigation and functional capacity restoration.
Keywords: Peripheral Arterial Disease, Exercise, Transcranial Direct Current Stimulation

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DOES CARDIOVASCULAR REHABILITATION IN PATIENTS WITH DIABETIC NEUROPATHY INFLUENCE FUNCTIONING AND NEUROPATHIC SYMPTOMS?

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Background: Diabetes Mellitus (DM) is a chronic metabolic condition with a high global prevalence, capable of causing severe complications for individuals. Among these complications is diabetic neuropathy, which leads to a decline in functional performance and quality of life. Cardiovascular rehabilitation (CR) is a viable alternative for managing diabetes and its complications.
Objectives: To evaluate the influence of a CR program on neuropathic symptoms, functional performance, quality of life, knowledge, and attitude toward DM in individuals with diabetic neuropathy.
Methods: This is a case series study using tests to assess functional performance (Timed Up and Go, 6-Minute Walk Test, and Short Physical Performance Battery), specific scales for diabetic neuropathy screening (Neuropathic Symptoms and Signs Scale, Visual Analog Scale for Pain), and questionnaires designed to investigate aspects related to fatigue, quality of life, knowledge, management, and acceptance of DM. The intervention consisted of an exercise program conducted twice a week, totaling 16 sessions.
Results: Fourteen patients with type 2 DM, with a mean age of 60.3 ± 9.2 years, participated in the study. A statistically significant improvement was observed in pain scores ($p = 0.028$) and neuropathic symptoms ($p = 0.010$), performance in the 6-Minute Walk Test ($p = 0.028$), coping attitude toward DM ($p = 0.014$), and quality of life domains (functional capacity, physical and emotional aspects, pain, vitality, and summarized mental component).
Conclusions: The CR program proved beneficial for patients with diabetes and neuropathy, leading to positive changes in functional aspects, symptom reduction, improved quality of life, and better coping with DM. Further studies and viable alternatives for implementing a program that includes physical exercise and health education for the diabetic population are warranted.
Implications: This research highlights the benefits of a twice-weekly exercise program for patients with diabetes and neuropathy, reinforcing the important role of physical exercise as an ally in diabetes treatment, bringing positive changes to the individual's biopsychosocial context.
Keywords: Diabetes Mellitus, Diabetic neuropathies, Exercise therapy

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COMPARISON OF RESISTANCE VERSUS AEROBIC EXERCISE DURING HEMODIALYSIS IN CHRONIC RENAL PATIENTS: A RANDOMIZED CONTROLLED TRIAL

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Background: Musculoskeletal disorders are common in hemodialysis (HD) patients. The duration and frequency of HD procedures contribute to immobility and a sedentary lifestyle, which, combined with changes in the disease itself, affect frailty and fatigue. These changes can be reversed through the adoption of intradialytic exercise programs.
Objectives: To investigate the effectiveness of resistance compared to aerobic exercise during the intradialytic period on peripheral muscle strength, walking speed, frailty, and fatigue in patients with chronic kidney disease.
Methods: In this randomized controlled trial, 32 patients were randomly allocated into two groups: Resistance exercise group (Group A), that included 8 exercises using elastic bands, dumbbells, and a Swiss ball, with 2 sets of 8 to 12 repetitions, an interval of 2 to 3 minutes between sets, and an intensity of 6 on the modified OMNI scale; and Aerobic exercise group (Group B), which consisted of 20 minutes of exercise on a cycle ergometer at an intensity between 5 and 7 on the modified Borg scale. All intervention protocols were performed during the first 90 minutes of hemodialysis, with the patient seated in a reclined chair. Peripheral muscle strength was assessed using the Sahean handgrip dynamometer and the 30-second sit-to-stand test; gait speed and frailty were assessed using the Fried Phenotype Model, and fatigue was evaluated using the Multidimensional Fatigue Inventory (MFI-20). The assessment of data normality was performed through visual inspection of histograms. The linear mixed model was used for intra and intergroup analyses. The level of statistical significance was set at 5%.
Results: Group A performed an average of 31.4 (±3.4) effective exercise sessions and Group B performed an average of 32.5 (±3.5) effective exercise sessions. There was no significant differences, between groups, in the results of 30-second sit-to-stand test (Group A, pre: 10.1 ± 2.0 and post: 14.9 ±4.2; Group B, pre: 10 ± 2.3 and post: 16.2 ± 2.7), handgrip strength test (HST) (Group A - pre: 25.7 ± 8.7 kgf and post: 28.1 ± 9.7kgf; Group B - pre: 29.1 ± 9.4kgf and post: 29.6 ±8.70kgf), and gait speed test (Group A - pre: 1.00 ± 0.20 m/s and post: 1.3 ± 0.3 m/s; Group B - pre: 1.1 ± 0.1 m/s and post: 1.5 ± 0.2 m/s). There was a decrease in the number of frail patients in both groups (18.8%), but no significant differences were observed between groups for the total fatigue score (Group A - pre: 55.9 ± 6.2 and post: 55.6 ± 7.9; Group B - pre: 58.9 ± 6.6 and post: 56.6 ± 8.8).
Conclusion: No significant differences were observed between intradialytic exercise interventions in terms of peripheral muscle strength, walking speed, frailty, and fatigue. It is suggested that further studies can be conducted on the subject, in addition to the inclusion of variables such as pain, which may influence the results of the outcomes studied here.
Implications: Regardless of the type of exercise performed during hemodialysis, patients with chronic kidney disease can have positive effects on muscle strength, walking speed, frailty, and fatigue.
Keywords: Intradialytic Physical Exercise, Muscle Strength, Frailty

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DIAGNOSTIC ACCURACY OF PHYSICAL FUNCTION TESTS FOR RISK OF FALLS IN INDIVIDUALS ON HEMODIALYSIS

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