CIPEEX

Expanded Summary

ASSOCIAÇÃO EDUCATIVA EVANGÉLICA
UniEVANGÉLICA

WHEY PROTEIN SUPPLEMENTATION IMPROVES LUNG FUNCTION, FUNCTIONAL CAPACITY, AND RESPIRATORY AND PERIPHERAL MUSCLE STRENGTH IN HEALTHY OLDER ADULTS

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INTRODUCTION

The elderly population often faces a decrease in calorie and protein intake, a phenomenon that plays a key role in the marked loss of muscle mass and strength. This nutritional decline is directly associated with the weakening of muscle reserves, which can manifest itself in several adverse health consequences. The reduction in the intake of essential nutrients compromises not only the structural integrity of muscles, but also their functional capacity (CHEN et al, 2022).

The effects of this muscle loss are far-reaching and affect various aspects of physical and respiratory function. The decrease in muscle mass has direct implications for respiratory and peripheral strength, significantly affecting the efficiency with which the body performs vital functions. This deterioration in strength and functional capacity can lead to widespread impairment of lung function, highlighting the importance of maintaining adequate nutrition to preserve the health and well-being of older adults (CHEN et al, 2022).

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In addition to the physical impacts, reduced muscle mass and the resulting loss of strength can have broad repercussions on the quality of life of older individuals. The reduced ability to perform daily activities and increased vulnerability to respiratory diseases underscore the urgent need for targeted nutritional strategies and public health interventions to reduce the adverse effects of malnutrition in this age group (AHMED AND HABOUBI, 2010). Therefore, the objective of this study was to evaluate the effects of whey protein isolate supplementation for 12 weeks on lung function, respiratory and peripheral muscle strength, and functional capacity.

MATERIALS AND METHODS

Forty-nine elderly volunteers were recruited through social media and the social project of UniEVANGÉLICA, Open University for the Elderly (UniAPI). After informed consent, participants were randomly allocated to two groups: a control group (22 elderly individuals, with a mean age of 69.46±6.24 years) without specific interventions, and a supplementation group (27 elderly individuals, with a mean age of 69.10±6.28 years). This randomization ensured impartiality and comparability of results.

Exclusion criteria were established to protect data integrity and participant safety, excluding individuals with neurological diseases that could interfere with assessments or participation in the study. The inclusion criteria were aimed at elderly individuals aged 60 to 85 years who signed the informed consent form, completed all assessments, and used the supplementation.

Protein supplementation was provided through isolated whey protein, commonly known as whey protein isolate, which was provided free of charge by the Heroes Science Institute (HSI). This is a vanilla-flavored whey protein isolate, which

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was made available in 25-gram sachets, providing a total of 20 grams of protein per dose/sachet.

Bioimpedance (BIA) technology was used to assess body composition, measuring % lean mass and % fat mass (Moraes-Ferreira et al., 2022), and the palmar grip strength of the upper limbs was assessed using the Jamar Palm Dynamometer (Moraes-Ferreira et al., 2022). Respiratory muscle strength was assessed using the manovacuometry test to evaluate maximum inspiratory pressure (MIP) and maximum expiratory pressure (MEP) (Moraes-Ferreira et al., 2022).

Lung function was assessed using a Master Screen spirometer (Jaeger, Germany), using the forced maneuver, following the standards proposed by the Brazilian Society of Pulmonology and Phthisiology. All volunteers underwent spirometry testing before and after administration of a fast-acting bronchodilator (Salbutamol 400 mcg). The parameters evaluated were FVC, FEV1, FEV1/FVC, PFE, and FEF25-75.

Functional capacity was assessed by the one-minute chair sit-to-stand test (Bohannon 1995). GraphPad Prism 5.0 software was used for statistical analysis and graph construction. The parametric t-test was used to compare measurements from the same group, and the non-parametric t-test ( ) was used to compare different measurements. Values of $p<0.05$ were considered statistically significant.

RESULTS

The results of the study show that whey protein supplementation provided significant improvements in several lung function parameters. The analysis revealed an increase in forced expiratory volume in the first second (FEV1), with a value of ($p <$

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0.0480). Similarly, the ratio between FEV1 and forced vital capacity (FEV1/FVC) showed a statistically significant improvement ($p < 0.0013$). Respiratory function was also improved, as evidenced by an increase in forced expiratory flow rate between 25% and 75% of vital capacity (FEF25-75%) and peak expiratory flow (PEF), with values of $p < (0.0409)$ and $(p < 0.0027)$, respectively.

Regarding the functional capacity of the elderly, the one-minute chair sit-to-stand test revealed that individuals who received whey protein supplementation performed a higher number of repetitions, with $p < (0.0031)$. In addition, a significant decrease in oxygen saturation (SpO2) was observed during the test, with a value of ($p < 0.0050$). These results suggest that supplementation not only improved muscle strength and endurance but also affected oxygen use efficiency during physical activities.

The positive effects of whey protein supplementation were also reflected in changes in body composition. A significant increase in muscle mass ($p < 0.0322$) and a reduction in body fat ($p < 0.0027$) were observed. In addition, improvements were recorded in inspiratory pressure (PImáx $p < 0.0425$) and maximum expiratory pressure (PEmáx, with $p < 0.0004$), and in manual grip strength (, $p < 0.0453$), indicating comprehensive benefits in both respiratory function and overall muscle strength.

CONCLUSION

Thus, we conclude that whey protein isolate supplementation for 12 weeks results in improved lung function, respiratory and peripheral muscle strength, and functional capacity in healthy older adults.

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