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Impact of Combined Photo-Biomodulation and Aerobic Exercise on Cognitive Function and Quality-of-Life in Elderly Alzheimer Patients with Anemia: A Randomized Clinical Trial

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Abstract

Purpose: Few data are available on the positive impact of photo-biomodulation (PBM) using low-level laser therapy as a complementary treatment for improving the cognitive function and optimizing the hemoglobin (Hb) level and oxygen carrying capacity in anemic elderly patients and consequently improving the quality-of-life. The present study aimed to evaluate a new, safe, and easy therapeutic approach to improve Alzheimer's disease-related symptoms that interfere with the whole life activities and social interaction of elderly patients.

Patients and methods: In this placebo-controlled clinical trial, 60 elderly patients suffering from anemia and mild cognitive dysfunction were randomly assigned into two equal groups to receive active or placebo low-level laser in addition to a moderate-intensity aerobic exercise over a 12-week period. Hb level as well as cognitive and functional tests were reassessed for any change after 12 weeks of intervention.

Results: By the end of this study, both groups showed significant improvements in Hb level, Montreal Cognitive Assessment Scale (MoCa - B basic), Quality-of-Life for Alzheimer's Disease scale, and Berg Balance scale scores along with significant reduction in body mass index (BMI) and waist-hip ratio (WHR) ($P<0.0001$). The experimental group which received active low-level laser in addition to moderate-intensity aerobic exercise showed more significant results compared to the control group which received placebo low-level laser in addition to moderate-intensity aerobic exercise in all the measured outcomes ($P<0.001$).

Conclusion: Combined low-level laser therapy and moderate-intensity aerobic exercises are more effective in improving the cognitive function and quality-of-life of Alzheimer's disease patients.

Clinical trial registration: www.ClinicalTrials.gov, identifier NCT04496778.

Keywords: Alzheimer's disease; cognition; exercise; laser; quality of life.

Conflict of interest statement

No potential conflict of interest was reported by the authors.Financial disclosure: There was no financial support for the research and publication of this article.

Figures

Figure 1 Flow chart for the participants...

Figure 2 A study participant who received...

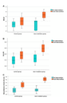

Figure 3 (**A**) Boxplot chartshowing...

Figure 4 (**A**) Boxplot chart...

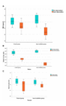

Figure 5 (**A**) Boxplot chart...

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