Acute neurobiological response to exercise in older women: an exploratory analysis of block strength training

Poster

Fisiología del desarrollo y envejecimiento

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Introduction: Aging reduces the adaptive capacity of the organism, affecting brain plasticity and regulation of the endocannabinoid system. Acute stressors such as physical exercise could modulate the acute physiological response, reflected in biomarkers such as anandamide, brain-derived neurotrophic factor (BDNF), and its precursor (proBDNF), with lower values indicating greater stress. However, it remains unclear whether strength training programs can modify this response in older women.

Objective(s): To analyze whether a block strength training (BST) program modifies the acute anandamide, BDNF, and proBDNF responses after an incremental aerobic exercise test in older women.

Methods: Nineteen older women (69.6±6.8 years) were assigned to BST (n=11) or to

an instructor-led group exercise class (control group, n=8). An incremental aerobic exercise test was performed before and after the 12-week intervention period. Blood samples were collected immediately after the incremental test to determine serum levels of anandamide, BDNF, and proBDNF. Data were analyzed using two-way ANOVA (group × time), considering the interaction as the main effect of interest.

Results: A significant interaction was observed for anandamide ($p=0.034$; $\eta^2=0.068$), with increased levels in the control group (3.89±1.32 vs. 4.72±2.11 ng/mL) and decreased levels in BST (4.08±1.22 vs. 3.24±1.58 ng/mL) after the intervention. Neither in BDNF ($p=0.167$; $\eta^2=0.033$) nor in proBDNF ($p=0.998$; $\eta^2=0.00$) were changes detected. Peak aerobic power did not show a significant interaction ($p=0.090$; $\eta^2=0.08$); however, BST tended to improve (74.55±12.14 vs. 84.55±14.40 W) compared with a decrease in the control group (77.50±8.86 vs. 73.75 ± 10.61 W) after the intervention.

Conclusion(s): BST reduces the acute response of the endocannabinoid system, particularly anandamide. Although this could be related to the stress imposed by peak aerobic power after the intervention, the underlying mechanisms remain unclear. Future studies should examine whether baseline biomarker levels are affected

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