TACSM Abstract

Acute and Chronic Effects of 12 Weeks of Combined Exercise Training on Plasma IL-6 in Post-Menopausal Women

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ABSTRACT

Post-menopausal women exhibit higher levels of IL-6, a pro-inflammatory cytokine and anti-inflammatory myokine, and up-regulation of cellular receptors and cofactors for IL-6. Exercise is associated with an acute elevation of IL-6, but consistent exercise training diminishes this response. **PURPOSE**: to analyze the acute and chronic effects of 12 weeks of combined resistance and aerobic exercise training on plasma IL-6 in overweight or obese, post-menopausal women (55-75 years). **METHODS**: Forty-three women were randomly assigned to an exercise (EX, n=22) or an education (ED, n=21) group. EX completed resistance training (2 sets of 8 resistance exercises at 80% of 1RM) followed by aerobic training (25-minute treadmill walk at 70-80% of HRR) three times per week for 12 weeks. ED attended classes and activities two times per week for 12 weeks to control for seasonal variation and social interaction. Blood samples were collected a total of 8 times: 4 times before training (BT) (before the acute exercise bout (PRE), immediately after exercise (PO), 1 hour after exercise (1HR), and 2 hours after exercise (2HR)) and 4 times after training (AT). Lean, post-menopausal, and age-matched women were recruited for collection of one resting blood sample to serve as healthy controls (LN, n=11). Plasma IL-6 was determined using an ELISA kit according to manufacturer instructions. **RESULTS:** Baseline IL-6 concentration was significantly lower in the LN group compared to the EX (LN BT PRE: 1.0 ± 0.5; EX BT PRE: 2.8 ± 1.3 pg/mL; $p<0.001$) and ED (LN BT PRE: 1.0 ± 0.5; ED BT PRE: 3.8 ± 1.7 pg/mL; $p<0.001$) groups. No statistically significant BT/AT x group interaction was observed ($p>0.05$) when the BT and AT PRE time points of the EX and ED groups were compared. In the EX group, PO was significantly higher than PRE (PRE 2.6 ± 1.2; PO 4.3 ± 1.8 pg/mL; $p<0.001$), and PO was significantly higher than 1 HR (PO 4.3 ± 1.8; 1HR 3.4 ± 1.2 pg/mL; $p=0.038$) and 2HR (PO 4.3 ± 1.8; 2 HR 3.9 ± 1.6 pg/mL; $p=0.005$). No statistically significant differences were observed when corresponding time points before and after the intervention within a group were compared (i.e., EX BT PRE to EX AT PRE) ($p>0.05$). **CONCLUSION**: The training intervention may not have been long enough and/or intense enough to observe a chronic effect of combined exercise training on plasma IL-6. Significant elevation of IL-6 immediately post-exercise was observed in the EX group, but this response was not blunted by consistent exercise training.