

Effect of Resveratrol Supplementation Combined with Swimming Training on Muscle Mass and Strength Performance in Young and Aged Mice

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Abstract

Introduction: Resveratrol (RES) is a famous supplement to have anti-oxidative and multi-functional bioactivities. Strength training has been proven to be a great strategy to increase muscle mass and functions but we don't know endurance training with RES supplement effects on muscle mass and strength performance. The purpose of this study was to evaluate the effects of RES combined with swimming training (ST) on muscle mass and strength in young and aged mice, respectively.

Methods: Study I, young male mice (10 weeks old) were orally administered RES for one month at 0, 25, 50 and 125 mg/kg/day, designated vehicle, RES-25, RES-50 and RES-125. In Study II, 57BL/6J mice (16 months old) were randomly divided into four groups: control group (C), supplementation with RES group (RES), swimming training group (ST), and a combination of ST and RES supplementation group (ST+RES) for one month. The strength performances were evaluated using forelimb grip strength which conducted before and after supplementation.

Results: Study I, we executed a trend analysis to reveal that RES treatments increased grip strength with no significant difference in muscle mass. In Study II, the forelimb grip strength of mice in the ST+RES group was significantly higher than those in the C, RES, and ST groups (by 1.3-, 1.2-, and 1.1-fold, respectively, $p < 0.05$) without muscle mass differences. With RES treatment groups, variables of creatine kinase (CK) activity were significantly lower than without RES treatment groups after an exercise challenge in both studies.

Conclusions: ST combined with RES supplementation in young and aged mice, the muscle strength and muscle damage were significantly improved compared to the single intervention with either RES or ST alone.

Keywords: Forelimb grip strength, Creatine kinase, Muscle damage