ADAPTATION TO ENDURANCE AND RESISTANCE TRAINING: INDIVIDUAL DIFFERENCES IN BLOOD PRESSURE CHANGES

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PURPOSE: Large individual differences in the responsiveness of systolic blood pressure (SBP) to regular endurance training have been observed in healthy normotensive subjects (1). The training induced changes have ranged from a +20 increase to a -40 mmHg decrease (2). The individual effect of exercise training mode to decrease SBP among the healthy subjects is not well known. We tested the hypothesis that subjects with a poor responsiveness to endurance training might benefit from resistance training in terms of SBP.

METHODS: The study population consisted of sedentary normotensive (SBP at rest <150 mmHg) healthy male and female subjects (n=73, 42±5 year). The randomized crossover study design included a 2-week laboratory-controlled endurance or resistance training period with a 2-month detraining period between the interventions. SBP was measured at resting condition and during a 5 min passive head-up tilt test.

RESULTS: Large individual differences were observed in the changes of SBP after both the endurance (average -3±7 mmHg, p=0.001, range -20 to +13 mmHg) and resistance training (average -2±7 mmHg, p=0.034, range -31 to +16 mmHg) in resting condition. The average decrease in the changes of SBP between genders was similar after both the endurance and resistance training (p=ns between males and females). There was no linear relationship between the changes of SBP after each training intervention (r=-.06, p=ns). On the contrary, when the study group was divided into quartiles according to the endurance training response (+6±3, -1±2, -5±2, and -12±3 mmHg change in resting SBP, p<0.0001), the group with the increased SBP after endurance training (+6±3 mmHg, n=18) decreased SBP after the resistance training intervention (-2±3 mmHg, p<0.0001, compared with endurance training response). The same difference in the changes of SBP was also observed during a sympathetic stimulation caused by the head-up tilting (+4±8 mmHg vs. -1±5 mmHg, p=0.052, after endurance and resistance training, respectively).

CONCLUSION: The individual responsiveness of SBP to exercise training is related to the mode of training. The healthy subjects whose SBP increase after endurance training intervention results in a decreased SBP after resistance training intervention.

REFERENCES