Abstract

Author: Mgr. Roman Juřík

Title: The effect of modifications in resistance training parameters on blood pressure values during and after the training session.

Objective: The aim of this study was to evaluate the acute effect of various forms of agonist-antagonist paired set and agonist resistance training on selected cardiovascular parameters in individuals with normal blood pressure and stage I hypertension.

Methods: This research was conducted as a single-blind, controlled study. Based on a systematic literature search, specialized resistance and aerobic training sessions were designed. The program lasted four weeks and included a familiarization phase lasting one week. Prior to the cross-sectional study, anthropometric measurements, biochemical sample collection, muscle strength and fitness testing, and subjective assessment of training intensity using the Borg Scale were conducted. The study consisted of four different resistance training sessions and one aerobic session. Resistance training were categorized into two basic methods: agonist-antagonist paired set and traditional (agonist) training, as well as based on targeted muscle groups (upper and lower body). Training variables were defined as follows: resistance load at 75 % of 1RM, rest interval between exercises and sets of 90 seconds, 3 sets, and 8 exercises. Differences between physically active individuals with normal blood pressure and hypertension, both of whom had sedentary job, were analyzed. The average age of these individuals was 50,2 ±6,3 years, with a range of 40-63 years, and an average BMI of 26,4 ±4,2 kg/m^2. To assess differences between baseline values and values obtained during various cross-selectional study, repeated measures analysis of variance was used. In cases where the assumptions of sphericity were violated, the Greenhouse-Geisser correction was applied. Subsequently, post-hoc Tukey's tests were conducted to determine specific differences.

Conclusion: The results of the analysis demonstrated statistically significant differences between the normotensive and hypertensive group regarding the overall effect of different training variants. In individuals with hypertension, hypotension was observed in the first twenty minutes after the completion of the training session, with no significant differences between

individual training variants. The complexity of the exercise was found to be a key factor in the acute increase in blood pressure values, especially for lower-body exercises, where the highest average increase was observed in both groups. There were no significant differences in aortic pulse wave velocity values between baseline and post-training values. Conversely, the augmentation index brachial and aortic improved during the resting phase.

Keywords: high blood pressure, hypotension, strength training, resistance training, cardiovascular disease