Abstract

Title: The effect of exercise with blood flow restriction on the development of muscle strength

Objectives: The aim of this work was to assess the magnitude of the effect of exercise with blood flow restriction on the development of muscle strength on the basis of a systematic research and to determine the main factors that moderate this increase.

Methods: Primary sources were searched in the scientific databases Academic Search Ultimate, Web of Science and Taylor and Francis. Individual training interventions were found in the included studies. Based on the training interventions, possible moderating factors of the magnitude of the effect on the development of muscular strength of the upper or lower limbs were defined. From the results of the studies, the effect size values of Cohen's d and Hedge's g were calculated. The influence of concrete parameters of application of the vascular occlusion and blood flow restriction exercise on the magnitude of the effect was evaluated on the basis of correlation analysis.

Results: A total of 27 studies were included in this diploma thesis, in which 39 different trainings using blood flow restriction exercises were found and included. Based on the correlation analysis, no direct relationship was found between the exercise parameters and the magnitude of the effect. The mean ES (d) value of all included studies was 0,642 (0,000-2,378) and the mean ES (g) value was 0,5 (0,002-1,821). The highest values of the correlation coefficient were found between the parameter number of interventions and ES (d) 0,38. The correlation coefficients for other parameters compared to ES (d) were following: intervention length 0,27; number of exercises 0,22; maximum cuff pressure 0,19; exercise intensity 0,07; cuff width 0,00.

Conclusion: Based on the ES values we can consider the excercise with blood flow restriction to be from moderately to very effective for strenght gain. Factors, which have moderated the strenght gain the most during the BFR excercise, were the number of interventions and the lenght of the intervention. The other selected factors had very low ES values.

Keywords: occlusion, strength, training, cuff, upper limb, lower limb