

Klaus Wiemann and Knut Hahn

Influences of strength-, stretching- and circulatory exercises on flexibility parameters of the human hamstrings

Bergische Universität - Gesamthochschule Wuppertal

Abstract

The purpose of this study was to compare the effect of resistance training, static and ballistic stretching and stationary cycling on the range of motion (ROM) and end ROM torque of hip joint flexion, resting tension of the hamstrings and stretch-induced electromyographic (EMG) activity of the hamstrings. Four separate experimental groups performed either 15 min resistance training of the hamstrings ($n = 12$), 15 min static stretching of the hamstrings ($n = 14$), 15 min ballistic stretching of the hamstrings ($n = 16$), or 15 min stationary cycling ($n = 12$). A control group ($n = 15$) remained resting for 15 min. ROM was increased after static and ballistic stretching and after stationary cycling. ROM remained unchanged in the resistance training group as well as in the control group. End ROM torque showed a significant increase after static and ballistic stretching. Static and ballistic stretching and stationary cycling decreased EMG activity significantly. Resting tension was decreased only after stationary cycling ($p < 0.1$). The constancy of the muscle resting tension suggests that merely the subjects' tolerance to higher stretching strain brings about the enlargement of ROM after short-term stretching exercises. The enlargement of ROM after stationary cycling could have been caused by the poor decrease of resting tension.

Key words: EMG, flexibility, hamstrings, resistance training, resting tension, stretching torque, stretch training

Vollständiger Text: <http://www.biowiss-sport.de/kubeng.PDF>