Effect of warm-up with a combination of static stretching and running on joint flexibility and jumping performance

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Purpose: The purpose of this study was to examine the influence of a combination of running and static stretching on ankle joint flexibility and jumping performance. Methods: Thirteen healthy young men performed a unilateral maximal jumping test using only the ankle joint without a counter movement on a sledge apparatus, after carrying out 3 different warm-ups (static stretching [SS], running [RUN], running after static stretching [SR]) as separate conditions. The maximal dorsiflexion ankle joint angle attained during the jumping test was recorded as a measure of joint flexibility, together with the ground reaction force and surface electromyogram (EMG) of the triceps surae muscles. The impulse of the force in the plantar flexion phase was calculated as an index of jumping performance, and root mean square values (RMS-EMG) were calculated for the same phase. Results and Discussion: The joint flexibility was significantly higher in SS and SR compared with RUN. The jump performance was significantly higher for RUN and SR compared with SS. For all muscles, there was no significant difference among different warm-ups in RMS-EMG. These results suggest that (a) jumping performance is spoiled by static stretching, and (b) a combination of static stretching and running help to prevent a decrease of jumping performance, while increasing joint flexibility.

Key words: Static Stretching, Warm-up, Flexibility, Jumping performance

The effects of combined circuit training on muscle size and peak oxygen uptake for elderly women

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Purpose: To investigate the effects of combined circuit training on muscle size and peak oxygen uptake for elderly women.

Methods: Twelve elderly women were divided into either a low-intensity aerobic exercise group (LOW-Ex) or a high-intensity aerobic exercise group (HIGH-Ex) in random order. Participants performed a combined circuit training consisting of resistance exercise and walking, 3 days per week for 8 weeks. Lower body resistance exercises were based on body mass and upper body resistance exercises performed using an elastic tube. Both groups carried out the same resistance exercise program. Between these resistance exercises, LOW-Ex group performed 40 seconds walking at the previously-determined speed equivalent to 55 %VO₂peak, whereas HIGH-Ex group performed 30 seconds walking at 75 %VO₂peak.

Results: Body-mass based resistance exercises significantly increased muscle thickness in the anterior aspect of thigh and the relative change was negatively correlated to the absolute value at pre-intervention. Isokinetic knee extension strength also improved by body-mass based resistance exercises and the relative change was negatively correlated to the relative value of isokinetic knee strength to body mass at pre-intervention. Furthermore, two-way repeated measures ANOVA showed that a significant group × time interaction existed in VO₂peak. VO₂peak increased only for HIGH-Ex group.

Key words: muscle hypertrophy, aerobic capacity, strength gain