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PROGRAM and ABSTRACTS

P19: THE EFFECTS OF SPRINT TRAINING ON MUSCLE ISOMETRIC FORCE AND EMG FREQUENCY ACTIVITY

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Evaluation of maximal voluntary isometric contractions (MVIC) is a common method to measure the muscle strength. Muscle strength increases with increasing workloads because of the recruitment of inactive muscle fibers and change in motor unit discharge ratio (frequency). EMG recording during contraction gives information about the electrical activity of muscle fibers.

Sprinting involves high intensity contractions that use available ATP and phosphocreatine together with glycogenolysis. Sprint training provides energy demand of muscle with facilitating aerobic and anaerobic energy production.

The aim of this study is to evaluate the effects of sprint training on muscle strength and surface EMG frequency values during maximal isometric knee extensions.

Maximal isometric right knee extension force of the subjects (n=16) were measured in 90º flexion for 30 seconds. After a 2 months training period that involve short duration maximal sprint running 3 times a week, force and EMG recordings were repeated. EMG data were recorded from vastus lateralis, vastus medialis and rectus femoris muscles (Megawin software 700046 version 2.2 ile raw EMG 1000 Hz. A/D 12 bit). The results were compared with paired t-test.

Isometric force was increased after training significantly ($p<0.001$). Contraction frequency was higher after post-training than pre-training in vastus medialis, vastus lateralis and rectus femoris muscles. This frequency difference was significant towards the last 5 seconds of the 30 second contraction in both vastus medialis and vastus lateralis.

Maximal sprint training increased force production of the subjects. The higher discharge frequency after sprint training is not solely enough to explain the force gain.

NOTES