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Myoelectrical manifestations of quadriceps fatigue during dynamic exercise differ in mono- and bi-articular muscles

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**Objectives:** The purpose of this study was to investigate different myoelectrical manifestations of neuromuscular fatigue among individual quadriceps muscle during high-load dynamic knee extension exercise (KEE). **Methods:** Seventy-four untrained males (aged 20-45) performed bilateral KEE consisting of five sets of ten repetitions at maximum load (2-min rest between sets). Surface electromyogram (SEMG) of vastus laterals (VL), vastus medialis (VM) and rectus femoris (RF) of right leg and torque were recorded continuously during KEE. Pre- and immediately post-KEE, maximal voluntary contraction (MVC) and corresponding EMG were measured. **Results:** MVC decreased  $17 \pm 15\%$  ( $p < 0.001$ ) after KEE. During KEE, significant decrease of torque occurred since set 4. In each set, average EMG (aEMG) had a trend to increase whilst mean power frequency (MPF) tend to decrease in quadriceps with increasing repetitions. Interestingly, myoelectrical manifestations of fatigue in RF were different from that in two vastii. Significant aEMG reduction in RF was observed not only in between-set comparison but also in pre-post comparison during MVC, but no changes were found for VL and VM. Similarly, in contrast with VL and VM, more pronounced decrease of MPF occurred in RF in between-set comparison and in pre-post comparison during MVC. **Conclusions:** The results suggest that RF is more susceptible to fatigue than two vastii when making dynamic KEE against heavy load, and corresponding divergence of neuronal coding mechanisms might exist in the central nervous system.

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