

論文の英文要旨

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(Title)

Region-specific and longitudinal muscle activity

~ muscle activity dynamics and muscle contraction sensation in the quadriceps and hamstring ~

(Abstract)

This study investigated the region-specific and longitudinal muscle activity in the quadriceps and the hamstring, which are proximal lower limb bi-articular muscles. Chapters 2 and 3 examined the effects of changes in the hip joint angle on region-specific and longitudinal muscle activity. Chapter 4 examined the relationship between the perception of muscle contraction sensation (MCS) and region-specific and longitudinal muscle activity. Nine trained participants performed leg extensions (LE) and leg curls (LC) at hip angles of 0°, 40°, and 80°. In LE, the rectus femoris was more active than the vastus muscle group. The distal rectus femoris was intensely active during LE with the hip angle flexed, while proximal activity was enhanced with the hip angle close to extended. In the hamstring, the semitendinosus muscle was more intensely active than the other muscles during any LC. The distal hamstring was intensely active at a hip angle of 0° LC, while the proximal was intensely active at 40° LC. The participants perceived MCS in the distal region more strongly than in the proximal in the quadriceps and hamstring. Although participants could perceive MCS longitudinally during the hip angle of 40° LE at the proximal rectus femoris, this tendency was not observed in the hamstrings. Moreover, the perception of MCS did not correlate with the grade of objective muscle activity in any regions and hip angles. This doctoral dissertation concluded that the region-specific and longitudinal muscle activity of the bi-articular muscles in the quadriceps and hamstring occurred by changing the hip joint angle. Moreover, although it is possible to perceive MCS region-specifically and longitudinally, it is impossible to perceive the grade of muscle activity.