

Inferior Muscularity of the Rectus Femoris to Vasti in Varsity Cyclists: Cross-sectional and longitudinal observations

Ryoichi Ema^{1,2}, Taku Wakahara³, Yasuo Kawakami⁴

¹Graduate School of Sport Sciences, Waseda University, Japan ²JSPS Research Fellow ³Faculty of Health & Sports Science, Doshisha University, ⁴Faculty of Sport Sciences, Waseda University

Our cross-sectional study on oarsmen hints to a notion that chronic participation in sport activities that require repetitive leg extensions (simultaneous extensions of knee and hip joints) does not induce muscular hypertrophy of the rectus femoris unlike vasti (vastus lateralis, vastus medialis, vastus intermedius). We hypothesized that this also applies to cyclists. In the first experiment, T1-weighted magnetic resonance (MR) images of the thigh were obtained from 8 experienced (experience: > 4 years) varsity male cyclists and 8 untrained male students. In the second experiment, MR images of the thigh were obtained from 7 varsity male cyclists (experience: 0.5-13 years) twice (6 months in-between; cycling training: 16 hours per week on

average). From the MR images, the volume of each muscle of the quadriceps femoris was determined. The muscle volumes of the vasti were significantly greater in the experienced cyclists than in the untrained students, whereas that of the rectus femoris was comparable for the two groups. In the second experiment, significant increases in volume of the vasti were observed after 6 month training, while the rectus femoris volume did not change. The current findings support our hypothesis and indicate inferior muscularity of the rectus femoris compared to vasti in the cyclists, which are due to muscle-specific adaptation to the repetitive leg extensions in their competitive and training activities.