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Passive Muscle Stiffness of Biceps Femoris is Acutely Reduced after Eccentric Knee Flexion

(大腿二頭筋スティフネスは伸張性膝関節屈曲運動後一過性に減少する)

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Abstract

Eccentric hamstring exercises reportedly prevent hamstring strain injury (HSI) in the biceps femoris long head (BFlh). However, information on the favorable adaptive responses in the BFlh to eccentric hamstring exercises is limited. We aimed to examine the acute effect of maximal isokinetic eccentric knee flexion on passive BFlh stiffness as a potential risk factor for the hamstring strain injury using ultrasound shear wave elastography. Ten young participants randomly performed both tasks involving five consecutive repetitions of isokinetic concentric and eccentric knee flexion (20°/s) with maximal effort on different legs. Passive BFlh shear modulus was taken before and 30, 60, 90, and 120 s after each task. Passive BFlh shear modulus was significantly reduced at all time points after eccentric knee flexion, whereas there was no significant change in passive BFlh shear modulus after the concentric task. The present findings indicate that passive BFlh stiffness would reduce specifically after low-volume, slow-velocity eccentric knee flexion exercise. The findings may help provide practitioners with a basis to develop more effective exercise programs for preventing HSI.