

Effect of hip abductor fatigue on neurokinematics of unilateral jump

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Introduction

Excessive knee valgus during a sport movement may extremely load the anterior cruciate ligament, evoking large biceps femoris activation response. We propose that not only hip abduction strength but also its fatigue may augment the magnitude of knee valgus and biceps femoris co-activation. Fifteen trained males performed a hip abduction fatigue exercise protocol consisting of full effort dynamometric eccentric-concentric contractions. Before and immediately after the exercise, hip abduction force, unilateral countermovement jump impulse as well as gluteus medius EMG activity and the magnitude of knee valgus during the jump was measured.

Method

Abduction force reduced after exercise. Knee valgus, however, did not increase as biceps femoris did not increase its activation either. The magnitude of knee flexion during jump was smaller after exercise.

Results

We conclude that the fatiguing exercise did not increase knee valgus, explaining that biceps femoris EMG remained unchanged.

Conclusions:

Participants however, changed their jump's kinematic strategy, i.e. reduced the magnitude of knee flexion probably to avoid excessive stress on the anterior cruciate ligament.

Keywords: hip joint abductors, m. gluteus medius, EMG, unilateral jump, knee joint,