

Examining Neuromuscular Control of the Vastus Medialis Oblique and Vastus Lateralis During Foundational Dance Movements

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Abstract

Elite dancers have higher rates of injury than college athletes; this may, in part, be due to improper alignment during dance movements. Electromyographic (EMG) activity at the vastus lateralis (VL) and vastus medialis oblique (VMO) may be important indicators of abnormal neuromuscular control at the patellofemoral joint in dancers. This study aimed to examine how turnout (maximal hip external rotation) impacts the activation of the VMO and VL during foundational dance movements in dancers. Thirty female collegiate dancers were recruited from intermediate and advanced ballet and modern technique classes. EMG was used to examine the activation of the VMO and VL during maximal isokinetic knee extensions and during demi-pliés and sautés in parallel and turned-out positions. Mean VMO:VL ratio was determined as a percent of the highest repetition of maximal extension. The VMO:VL ratio was significantly lower during parallel sautés (0.921 ± 0.258) in comparison to turned-out sautés (1.008 ± 0.384 ; $p=0.033$) and parallel pliés (1.185 ± 0.509 ; $p=0.002$). No relationships were seen between VMO:VL ratio, injury history, and predominant style of dance. These findings suggest that dancers do not properly activate the VMO during jumps in parallel, which may cause improper patellar tracking and potential knee pathologies. Proprioceptive and neuromuscular training of the VMO might be warranted for collegiate dancers.