Effects of Short Foot Exercise on Ankle Eversion Velocity

DANIEL METRI, JACOB MAYORAL, CONNOR OWEN, ANDY ARANT, DANE JOHNSON, ROBERT DUDLEY, & ANDREA DU BOIS

APU Biomechanics Lab; Department of Kinesiology; Azusa Pacific University; Azusa, CA

Category: Undergraduate

Advisor / Mentor: Du Bois, Andrea (adubois@apu.edu)

ABSTRACT

The biomechanical position of the foot while landing plays a major role in performance and injury. A common issue of landing is excessive foot pronation and subsequently ankle eversion. This biomechanical position can result in knee abduction, increasing the chance of knee injury. The velocity at which the ankle everts may also be a component of injury as long distance runners that became injured had higher ankle eversion velocity in their landing strides while running. Short foot exercise (SFE) strengthens the intrinsic muscles of the foot and help stabilize the arch which assists in eccentrically controlling pronation. However, acute effects of SFE are unknown. **PURPOSE**:The purpose of the study was to examine if an acute bout of SFE utilized as a warm up before jumping would have an impact on ankle eversion velocity while landing. **METHODS:** Ten healthy participants (6 male; 24.9 ±1.91 y) underwent vertical drop jumps (DJ) from an 18-inch box. The test began with three DJ trials (PRE) and were followed by SFE. The SFE involved contractions of 5 seconds and were performed with two sets of 30 repetitions on both feet both in sitting and standing. The participants then performed three more DJ tests (POST). Kinematics were collected at 100 Hz with a 14-camera motion system. Marker position data to calculate joint velocity as motion in the distal segment relative to proximal. Peak frontal plane ankle eversion velocity (EV) during landing was used for analysis. **RESULTS:** There was no effect of SFE on right EV (PRE: -119.32 ± 37.10 °/s; POST: -104.40 ± 39.32 °/s; p=0.202, *d*=0.435) or left EV (PRE= -129.93 ± 56.17°/s; POST= -135.43 ± 66.41 °/s; p=0.697; *d*=0.127). **CONCLUSION:** Performing acute SFE had no effect on ankle eversion velocity during the landing of the participants. It may be beneficial to examine single leg activity to increase demands. Additionally, participants were healthy and demonstrated proper mechanics, thus limiting the ability to induce a change.