SWACSM Abstract

The Effects of Chronic Pain Levels on Lower Extremity Energetics During Jump Landing/Cutting in Chronic Ankle Instability Patients

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ABSTRACT

Up to 75% of patients with lateral ankle sprains develop chronic ankle instability (CAI). A majority of CAI patients report chronic pain and show altered jump landing/cutting patterns. Calculating joint energetics affected by chronic pain provides insight into understanding the effects of chronic pain levels on lower limbs in CAI patients. **PURPOSE**: To identify the effects of chronic pain levels on lower limb energetics during jump landing/cutting in CAI patients. **METHODS**: This study was a cross-sectional study. Fifteen CAI patients with high pain (High pain) (6males, 9females; age=22.1±2.1year; height=1.74±0.09m; mass=71.3±10.6kg, pain=66.9±9.4), matched 15 CAI patients with low pain (Low pain) (6males, 9females; age=22.3±2.1year; height=1.74±0.08m; mass=70.1±10.7kg, pain=89.3±2.6), and matched 15 healthy controls (Control) (6males, 9females; age=21.3±1.7year; height=1.73±0.08m; mass=70±10.3kg, pain=100±0). We followed the International Ankle Consortium and utilized the Foot and Ankle Outcome Scores for CAI and chronic pain levels. Ground reaction forces were collected during the jump landing/cutting, while joint power was defined by angular velocity and joint moment data. We calculated ankle, knee, and hip joint energy via the integration of negative (dissipation) or positive (generation) power curve areas. The loading phase was defined by the time from initial contact to 150 ms following, while the cutting phase extended from maximal knee flexion to 150 ms following. The Wilcoxon signed-rank test was used to assess joint energetics data. **RESULTS**: The high pain showed less energy dissipation and generation in the ankle during the loading and cutting phase than the low pain (p=.013 and p=.002) and control (p=.018 and p=.028). The high pain exhibited more energy generation in the hip during the cutting phase than the low pain (p=.038) and control (p=.013). **CONCLUSION**: The high pain showed lower energy dissipation and generation in the ankle during the loading and cutting phase than the low pain and control, possibly reflecting an effort to reduce the burden on the ankle joint. The high pain reported more energy generation in the hip during the cutting phase than the low pain and control, suggesting a proximal compensatory strategy. Therefore, chronic pain may impact motor outcomes.