The Effects of Whole Body Vibration on Landing Biomechanics Linked to Secondary Injury Risk in Individuals With Anterior Cruciate Ligament Reconstruction

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Individuals with ACL reconstruction (ACLR) present with persistent quadriceps dysfunction (e.g. deficits in strength and activation). Quadriceps dysfunction alters landing biomechanics following ACLR and may heighten the risk of secondary injury. Previous research has demonstrated that whole body vibration (WBV) improves quadriceps function, but its effect on landing biomechanics are unknown. Thus, the purpose of this study was to evaluate the effect of WBV on landing biomechanics in those with ACLR. 34 participants completed single- and double-leg landing tasks before and after a control and WBV intervention. No significant condition*time interaction effects were found in the ACLR limb for neither single- nor double-leg landing outcomes (P=0.108–0.973). There was a significant condition*time interaction effect for the vertical ground reaction force (vGRF) (P=0.014) and adduction moment (P=0.046) in the uninvolved limb during single-leg landing, but no interaction effects for double-leg (*P=0.128-0.973*). *Post Hoc* analysis demonstrated smaller vGRF in the uninvolved after WBV (P=0.001). However, no significant pairwise comparisons existed for the UNINV limb adduction moment (P=0.120-0.363). WBV significantly reduces uninvolved limb vGRF in single leg jump landing biomechanics. Decreasing vGRF using WBV presents a clinical implication as lower vGRF may be associated with a reduced risk of secondary ACL injury.