**ground reaction force variables differ between dominant and non-dominant limbs during a drop vertical jump task**

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**Introduction**: Previous research demonstrates that asymmetry in loading during a double limb drop vertical jump task is a risk factor for anterior cruciate ligament (ACL) injury. Additionally, individuals following ACLR continue to demonstrate asymmetries in loading, including those who are able to successfully return to play. While some variability in peak vertical ground reaction force (vGRF) and peak vGRF loading rate (vGRF-LR) is expected, we would like to understand the variability in both the magnitude and between-limb symmetry of these measures in a healthy cohort, including the potential influence of limb-dominance.

**Purpose**: The purpose of this study is to describe between limb differences in vertical ground reaction forces (vGRF) and loading rates (vGRF-LR) during a double limb landing task in a healthy cohort including: (a) the peak vGRF and peak vGRF-LR normalized to body weight (BW) for the dominant and non-dominant limbs, and (b) the limb symmetry indices (LSI) for peak vGRF and peak vGRF-LR.

**Methods**: 52 healthy subjects (46 female, age = 20.6 ± 2.7 years, mass = 68.6 ± 10.4 kg, height = 171.5 ± 9.2 cm) participated in this study. Subjects completed 8 trials of a double limb drop vertical jump task while force plate data were collected. The peak vGRF during the first 100 ms of stance and peak vGRF-LR (highest frame-to-frame difference in magnitude of vGRF) were extracted for each limb during each trial. Mean values were calculated for each participant for their self-reported dominant and non-dominant limbs. Limb symmetry indices (LSIs) were calculated as the dominant limb over the non-dominant limb multiplied by 100. Descriptive analyses were performed to calculate the mean, standard deviation, and 95% confidence interval for each measure. Paired t-tests were performed between non-dominant and dominant limbs.

**Results**: The mean peak vGRF of the dominant limb was 1.96 ± 0.45 BWs and was 2.26 ± 0.49 BWs in the dominant limb, resulting in an LSI of 88.3 ± 12.8 and a significant difference between limbs, t(51) = 6.83, p < 0.001. The mean peak vGRF-LR of dominant limb was 69.5 ± 25.8 BW/s and was 78.4 ± 25.9 BW/sec in the non-dominant limb, resulting in an LSI of 90.7 ± 15.8 and a significant difference between limbs, t(51) = -4.96, p < 0.001.

**Conclusions**: This study describes peak vGRF and peak vGRF-LR values in the dominant and non-dominant limbs during a drop vertical jump task. Our data indicate that healthy subjects do have asymmetry in GRF variables: the non-dominant limb undergoes higher peak vGRF and peak vGRF-LR compared to the dominant limb. The ranges reported in each limb may assist clinicians in identifying individuals outside normative ranges who could benefit from additional screening measures.