

Clinically Significant Side-to-Side Lower Extremity Strength Asymmetries in US Army 101st Airborne Soldiers

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Side-to-side (S-S) symmetry of lower extremity (LE) muscle strength is important for preventing between-limb compensations that overload one side and increase injury risk. As such, S-S comparisons in LE strength are frequently made in injury prevention and rehabilitation contexts. Past work consistently shows S-S LE strength differences <10% are normal in athletes. However, S-S LE strength differences in large military samples have not been previously reported. Considering the healthcare burden of unintentional musculoskeletal injuries, characterizing the S-S LE strength differences in Soldiers will give data of the frequency of potentially dangerous S-S muscle imbalance. This data can then be used to screen for future risk of new LE injury or re-injury. **PURPOSE:** To describe the prevalence of clinically significant S-S asymmetry (S-S difference >10%) in LE strength of Soldiers. **METHODS:** Fully operational male US Army 101st Airborne Soldiers (n=402; age 28.1 ± 6.6 yr; height 177.7 ± 7.1 cm; mass 84.1 ± 12.5 kg) were tested. An isokinetic dynamometer measured concentric quadriceps (QUAD) and hamstring (HAM) mean peak torque (Nm/kg, 5 reciprocal repetitions, 60°/sec), and isometric hip abductor (ABD) mean peak force (N/kg, 3 reciprocal repetitions, 5 sec/effort). A handheld dynamometer measured isometric ankle eversion (EV) and inversion (INV) mean peak force (kg, 3 repetitions, 5 secs/effort). Counts were made of Soldiers with S-S differences >10% (designated 'suprathreshold'(ST)) and proportions calculated. **RESULTS:** For QUAD and HAM strength, 41% had S-S differences >10% (ST range=11-50%). For ABD strength, 38% had S-S differences >10% (ST range=11-53%). For EV strength, 34% had S-S differences >10% (ST range=11-37.5%). For INV strength, 37% has S-S differences >10% (ST range=11-40%). **CONCLUSION:** A large proportion of Soldiers (>33%) had S-S leg strength differences >10% (maximum S-S difference=53%). Consideration should be given to correction of S-S imbalances via targeted training programs. Such intervention may contribute to reducing the risk of sustaining new unintentional LE injury or re-injury, and enhance Soldiers' ability to safely and effectively execute mission essential tasks.

Supported by the U.S. Army Medical Research and Materiel Command under Award No. W81XWH-06-2-0070/09-2-0095