

## **Single-Leg Balance Impairments Persist in Fully Operational Military Special Forces Operators with a Previous History of Low Back Pain**

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### **Objectives:**

Single-leg balance (SLB) can be chronically impaired after low back pain (LBP). Impaired SLB is a risk factor for recurrent LBP and lower extremity injury. The Special Forces Operator (SFO) deploys on high-risk missions under extreme conditions, and impaired SLB can potentially threaten SFO safety and mission success. The purpose of this study was to compare SLB in fully operational SFOs with and without a history of LBP. We hypothesized that SLB deficits would be present in SFOs with a history of LBP.

### **Methods:**

A total of 226 SFOs were included in this analysis. Comparisons were made between SFOs with a medical chart documented (MCDH) history of low back pain (LBP; n=43; age  $31.2\pm 10.3$ yr; height  $177.3\pm 7.2$ cm; mass  $87.3\pm 11.8$ kg) compared to those without a MCDH of LBP (healthy; n=183; age  $28.0\pm 6.0$ yr; height  $177.9\pm 6.0$ cm; mass  $84.9\pm 8.8$ kg). Single-leg static balance (eyes open (EO) and eyes closed (EC)) was tested in both groups using a force plate. Ground reaction forces (GRFs) were sampled at 100Hz. Subjects stood barefoot, hands on hips, for 10 seconds. The variability in the GRFs was averaged across three trials for each leg for both conditions. Greater variability of GRFs represents greater postural sway. Demographics, left leg, and right leg were compared between groups using independent t-tests ( $\alpha=0.05$ ).

### **Results:**

The LBP group was older than the healthy group ( $P=0.01$ ) by approximately 3 years. There were significant between-group differences for each leg for both conditions with the healthy group demonstrating better single-leg balance compared to the LBP group. P values ranged from 0.01 to 0.03.

### **Conclusions:**

Impaired SLB persist in SFOs with previous reported LBP. Consideration should be given to routine SLB testing of these SFOs. This data can be used to administer targeted intervention that corrects potentially dangerous postural disequilibrium, enhancing the safety of the SFO and increasing the probability for mission success. The premature return of a SFO to fully operational status with persistent post-injury impairments can be considered the same as the premature return of an elite athlete to unrestricted sports with incomplete rehabilitation. Therefore, SFOs who report LBP should be enrolled in physical training to improve balance to prevent the recurrence of LBP and potentially prevent lower extremity injury.

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