Mid Atlantic Regional Chapter
of the
American College of Sports Medicine

45th Annual Scientific Meeting, November 4th- 5th, 2022
Conference Proceedings
International Journal of Exercise Science, Issue 9, Volume 11

The Quantification of Muscle Activation during the Loaded Carry Movement Pattern

Thomas P. Holcomb, Autumn R. Hultberg, Madison L. Nehlen, Kaitlyn E. Bergmann, Jonas D. Chan, Samuel H. Ellestad, Michael E. Holmstrup, Jeremy R. Dicus. Slippery Rock University, Slippery Rock, PA

The 'loaded carry' movement pattern is a popular resistance training activity that stresses the core musculature across multiple movement planes. Contrary to other dynamic movement patterns (i.e., squat, hinge), all loaded carries involve locomotion, the conveyance of an implement across a set distance. Variations include bilateral (i.e., farmer's carry; FC) and unilateral (i.e., suitcase carry; SC) implement positions, which recruit the core differently. To the authors' knowledge, the unique contribution of locomotion to the loaded carry has not been quantified. **PURPOSE:** To compare the activation of core musculature between the FC and SC and intensity-matched, non-locomotive farmer's (FH) and suitcase holds (SH). **METHODS:** Healthy, college-aged individuals were recruited and surface electromyography of the rectus abdominis (RA), external oblique (EO), longissimus (LT), and multifidus (MF) was measured bilateral using standard procedures. Individuals completed time- (i.e., time to walk 25 meters) and intensity-matched (i.e., body weight in plank position) randomized sets of the FC, SC, FH, and SH separated by 5-min rests. A one-way ANOVA was utilized to compare the exercises. **RESULTS:** Twenty-five apparently healthy, young individuals participated. The FC/FH load averaged 50.7±1.9 kg across two equally-weighted dumbbells. The FC elicited higher activation bilaterally in the LT (+9.2% left (L), +10.8% right (R)), MF (+9.6% L, +11.2% R), RA (+4.3% L, +6.1% R), and EO (+4.7% L, +7.3% R), respectively, compared to the FH (P<0.05). The SC/SH single-dumbbell load averaged 25.3±0.95 kg. There was greater activation bilaterally in the LT (+7.5% L, +2.8% R), and MF (+8.2% L, +4.6% R) during the SC compared to the SH (P<0.05), with a similar response noted in the contralateral (P<0.05). Conversely, on the ipsilateral side of the SC, the RA (+1.8%) and EO (+2.3%) displayed greater activation compared to the SH (P<0.05), but this was not different in the contralateral side. **CONCLUSION:** This is the first study to quantify muscle activation unique to locomotion in the loaded carry movement pattern. The FC and SC were characterized by increased core muscle activation bilaterally than matched holds, with the SC exhibiting unique additions to ipsilateral muscle activation.