Mid Atlantic Regional Chapter
of the
American College of Sports Medicine

Annual Scientific Meeting, November 1st – 2nd, 2019
Conference Proceedings
International Journal of Exercise Science, Volume 9, Issue 8


# Differences in Performance Decline Between Sex Under Simulated Military Operational Stress

Philip J. Agostinelli[1], William R. Conkright[1], Aaron M. Sinnott[1], Meaghan E. Beckner[1], Shawn R. Eagle[1], Brian J. Martin[1], Shawn D. Flanagan[1], Christopher Connaboy[1], Anne Germain[2], Bradley C. Nindl[1]. [1]Neuromuscular/Warrior Human Performance Research Laboratory, Pittsburgh, PA, [2]Military Sleep Tactics and Resilience Research Team, Department of Psychiatry, School of Medicine, University of Pittsburgh, Pittsburgh, PA

**PURPOSE:** Physical exertion, cognitive overload, sleep deprivation and caloric restriction are factors of operational stress in the military. This study aimed to investigate how Simulated Military Operational Stress (SMOS) effects performance on Tactical Mobility Test (TMT) both in men and women. **METHODS:** As part of an ongoing study; Forty male soldiers (26±5 yrs, 174±8 cm, 78±14 kg) and eleven female soldiers (25±5 yrs, 175±13 cm, 88±21 kg) completed a SMOS protocol lasting 5 days (D) and nights (N). Days 3 & 4 (D3, D4), subjects consumed 50% of caloric demands. N1, 2, & 5 (D1, D2, and D5) subjects slept from 2300-0700. N3-4, subjects slept from 0100-0300 and 0500-0700. Familiarization was completed D1. During D2 & 5 participants underwent a Tactical Mobility Test (TMT), consisting of the following: 2-min water can carry (WCC) (20 kg each hand), fire & movement course, 20-m casualty drag (CD) (91kg), 300-m shuttle run unloaded (SRU) and loaded (SRL) (16 kg), 2-mi paced, and 2-mi best effort timed ruck march (RM) (15 kg). Two-way mixed ANOVAs with Bonferroni Post Hoc ($p<0.05$) were used to identify if the difference in TMT performance form D2-5 was different between men and women. **RESULTS:** Regardless of sex a main effect for SRUt across days was found. SRUt increased by 6% from D2 to D4 and D5 (D2: 99.16±18.75, D4:104.99±21.50, $p=0.008$; D5: 105.34±18.37, $p=0.002$); additionally, D5 increased by 5% from D3 (D5: 105.3384±18.37, D3: 100.91±18.89; $p=0.008$). Although insignificant, mean CD time for males from D1 to D4 decreased by 5% from 44±27 to 42±25 seconds, while in women D1 to D4 increased by 13% from 76±29 to 86±54 seconds. Sex differences in performance approached significance; however, there was a small sample size and limited power base on current data. **CONCLUSION:** Short-term exposure to military operational stress leads to a decline in anaerobic capacity regardless of gender. The preliminary findings suggest SMOS the affect women and men equally. Even though there was not a statistical difference in CD time; there were possible relevant differences related to operationally differences that should be considered. When pulling a fallen soldier to safety 10 second unexposed on the battlefield can increase susceptibility to fire for both the wounded and the rescuing solider. Future investigation with a larger sample size is needed.

This study was funded by the Department of Defense (Award # W81XWH-17-2-0070). The results and opinions herein are those of the authors and do not necessarily constitute endorsement of the Department of Defense.