GENDER DIFFERENCES IN MODIFIABLE MUSCULOSKELETAL CHARACTERISTICS IN US ARMY HELICOPTER PILOTS

INTRODUCTION: Helicopter pilots must be physically prepared to withstand the physical stress of flight missions including vibration, noise, and the weight of night-vision goggles. The results of this stress include a high prevalence of nonspecific neck pain (NP) and low back pain (LBP). A prevalence of NP/LBP is even greater in females in military and civilian populations. This disparity may be due to suboptimal musculoskeletal characteristics that predispose females for NP/LBP. The purpose of this study was to compare those characteristics between male and female pilots. METHODS: A total of 123 pilots from a Combat Aviation Brigade were consented and participated in testing at the Warrior Human Performance Research Laboratory: 115 males (Age:32.5±6.3yrs, HT:177.9±7.1cm, WT:83.9±11.3kg) and 8 females (Age:29.6±4.7yrs, HT:163.2±6.5cm, WT:63.9±9.7kg). Laboratory testing included cervical/lumbar spine active range-of-motion (ROM) and hip rotation passive ROM; cervical/scapular stabilizer isometric muscular strength and trunk/upper trapezius isokinetic muscular strength; and forward head/shoulder posture and pectoralis minor length. Three trials in ROM, isometric muscular strength, and postural testing were averaged for analyses. The average of five trunk/upper trapezius isokinetic muscular strength trials was used for analyses. Strength values were normalized to body weight. Mann-Whitney U tests were used to examine gender differences across all variables (p<0.05). RESULTS: Female pilots had significantly greater cervical extension/rotation, lumbar lateral flexion, and hip internal/external rotation ROM; significantly lower cervical flexion/extension and trunk flexion/extension/rotation strength; and significantly less forward head/shoulder and pectoralis minor length when compared to male pilots (p<0.05). DISCUSSION: The current investigation revealed gender differences in several modifiable musculoskeletal characteristics which indicates that injury prevention strategies may require gender-specific strategies. The measured variables in the current study have been associated with individuals with NP/LBP in previous studies. Helicopter pilots would benefit from periodical musculoskeletal screening for gender-specific intervention programs. Supported by USAMRMC #W81XWH-11-2-0097

(295 words)
Learning Objectives: 1. Gender differences in modifiable musculoskeletal characteristics are described.