Shoulder Strength, Flexibility, and Postural Characteristics among Naval Special Warfare Students

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ABSTRACT

Objective: To quantify the differences in shoulder strength, flexibility, and postural characteristics between those with and without a history of shoulder injury.

METHODS

Naval Special Warfare Sea, Air and Land Qualification Training (SQT) students are required to complete physically and mentally rigorous tactical training courses to become an Operator. Due to years of physical and tactical training working up to and during SQT, it is common to see SQT students with a prior history of musculoskeletal injuries. Specifically for those with a history of shoulder injury, it is of interest to evaluate differences in musculoskeletal characteristics of the shoulder between those with and without a prior history of shoulder injury. Students were recruited from Naval Special Warfare groups and were classified as having a history of shoulder musculoskeletal injuries. Sixty-nine subjects were included with 35 students identified to have a history of shoulder musculoskeletal injuries. The lobster sign (tendency to extend their arm above shoulder level) was the most common injury (n=10). All subjects were aged between 21-33 (x̅=23.9±1.1 years). METHODS: One hundred seventy-one SQT students were included in this study. All students were required to complete a three-week laboratory testing battery. Tests included passive and active ranges of motion (ROM), isokinetic strength, and side-to-side differences. RESULTS: Shoulder IR/ER, elevation (ELE), and protraction/retraction (PRO/RET) strength was measured using an isokinetic dynamometer. For forward and external rotation (FOR/EXT) elevation and side-to-side differences were calculated as a ratio of right over left side. Each variable was screened for normality using the Shapiro-Wilk test. Based on the normality, either independent t or Mann-Whitney U tests were used to compare between the groups. Statistical significance was set at p<0.05. RESULTS: Shoulder IR ROM differed significantly between the groups (p=0.031). Shoulder ELE ROM was significantly different between the groups (p=0.004). Shoulder ER ROM was significantly different between the groups (p=0.031). Shoulder FLE ROM was significantly different between the groups (p=0.016). There were no significant differences for any strength variables. The increases had less left shoulder ER ROM (p=0.004*) and more right FSP (p=0.031). Side-to-side difference on shoulder FLE ROM was significantly different between groups (p<0.001). Shoulder external rotation (FOR/EXT) elevation and side-to-side differences were calculated as a ratio of right over left side. Each variable was screened for normality using the Shapiro-Wilk test. Based on the normality, either independent t or Mann-Whitney U tests were used to compare between the groups. Statistical significance was set at p<0.05. RESULTS: Shoulder IR ROM differed significantly between the groups (p=0.031). Shoulder ELE ROM was significantly different between the groups (p=0.004). Shoulder ER ROM was significantly different between the groups (p=0.031). Shoulder FLE ROM was significantly different between groups (p<0.001).

CONCLUSIONS: Prior shoulder injury is significant and不可忽略的 in the physical and tactical training of SQT students. Shoulder IR ROM, ELE ROM, and ER ROM were significantly different between the groups. This study shows that there is a need to include the assessment of shoulder ROM and strength into the physical training regimen to prepare Operators for the demands of their career. PRACTICAL APPLICATIONS: The results of this study can be used to design a musculoskeletal assessment battery that can be used as a means to objectively monitor and track Operators’ musculoskeletal needs over their career. IMPACT: Shoulder pain is a common issue for Operators and can lead to decreased performance and injury. The current lack of assessment tools to monitor Operators’ musculoskeletal needs during their career is concerning. The results of this study suggest that a more comprehensive assessment battery is needed to monitor Operators’ musculoskeletal needs and address these issues before they become a major concern.