SHOULDER STRENGTH, FLEXIBILITY, AND POSTURAL CHARACTERISTICS AMONG NAVAL SPECIAL WARFARE STUDENTS WITH AND WITHOUT HISTORY OF SHOULDER INJURY

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Naval Special Warfare Sea, Air and Land Qualification Training (SQT) students are required to complete physically and mentally vigorous 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 see if they exhibit alterations in shoulder strength, flexibility, and posture. **PURPOSE:** To evaluate differences in musculoskeletal characteristics of the shoulder between those with and without a history of shoulder musculoskeletal injuries. **METHODS:** One hundred seventy-five SQT students volunteered to participate in comprehensive laboratory testing. Based on self-reported history of shoulder injuries, subjects were assigned to one of two groups: no injury group (NoInj) or an injury history group (InjHist). 162 SQT students had no history of shoulder injury (mean±SD; age=24.1±2.7years; height=179.0±5.8cm; mass=84.4±7.9kg) and 13 students had a history of shoulder injury (age = 23.9 ± 1.8 years; height = 181.5 ± 7.1 cm; mass=84.7±9.1kg; time from injuries=363±165 days). For those students who had a history, shoulder injuries were on their right (n=5), left (n=7), or both shoulders (n=1) and occurred during physical training (n=5), weight training (n=4), or Basic Underwater Demolition/SEAL training (n=4). Shoulder internal/external rotation (IR/ER), elevation (ELE), and protraction/retraction (PRO/RET) strength was measured using an isokinetic dynamometer. Strength values were normalized to body weight (%BW). Passive shoulder IR/ER, flexion (FLE), and extension (EXT) range-of-motion (ROM) and posterior scapular tightness (PST) were measured using a digital inclinometer. Forward shoulder posture (FSP) and pectoralis minor length (PML) were measured using a double-square device. All assessments were completed bilaterally, and side-to-side differences were calculated as a ratio of right over left side. Each variable was screened for normality using Shapiro-Wilk test. Based on the normality, either independent t-tests or Mann-Whitney U tests were used to compare between the groups. Statistical significance was set at p<0.05 *a priori*. **RESULTS:** There were no significant differences for any strength variables. The InjHist group had significantly less left shoulder ER ROM (NoInj: 111.1°±9.2°, InjHist: 106.3°±4.4°, p=0.004) and increased right FSP (NoInj: 15.7cm±2.0cm, InjHist: 17.0cm±2.2cm, p=0.031). The side-to-side difference on shoulder FLE ROM differed significantly between the groups (NoInj: 1.00±0.03, InjHist: 1.04±0.05, p=0.016). **CONCLUSIONS:** Given the decreased ROM, increased forward posture, and greater side-to-side difference that appear to be associated with injury, it is important to assess flexibility, posture, and side-to-side differences as a part of routine physical fitness evaluation. Addressing specific suboptimal characteristics is an important step to keep Operators injury-free and extend their career. **PRACTICAL APPLICATIONS:** Although all students in InjHist were cleared for physical and tactical training, subtle alterations in ROM, posture, and side-to-side differences still exist. Periodical laboratory testing plays a critical role as a means to objectively monitor and track Operators’ musculoskeletal needs over their career. **ACKNOLEDGEMENTS:** ONR#N00012-11-1-0929