

ORIGINAL RESEARCH

STRENGTH PROFILES IN HEALTHY INDIVIDUALS WITH AND WITHOUT SCAPULAR DYSKINESIS

Daniel C. Hannah, MA, ATC¹

Jason S. Scibek, PhD, ATC^{1,2}

Christopher R. Carcia, PhD, PT, OCS, SCS^{1,3}

ABSTRACT

Background: Muscular weakness of the shoulder complex is commonly found in patients presenting with scapular dyskinesia; however, little is known regarding muscular performance in healthy individuals with scapular dyskinesia.

Purpose: To compare isometric strength measures of the shoulder complex between healthy individuals with and without scapular dyskinesia. It was hypothesized that healthy individuals with scapular dyskinesia would demonstrate decreased isometric strength of the scapular stabilizers and rotator cuff when compared to healthy individuals without scapular dyskinesia.

Study Design: Cross-sectional study.

Methods: Forty healthy, college-aged participants were recruited. Sixty-eight percent of subjects (27 of 40) presented with scapular dyskinesia. Thus, a matched-pairs analysis was conducted with 26 subjects (age: 22.00 ± 2.06 y; height: 168.77 ± 8.07 cm; mass: 70.98 ± 13.14 kg; BMI: 24.75 ± 3.04 kg/m²; 6 males; 20 females). The presence of scapular dyskinesia was determined visually using the scapular dyskinesia test with a dichotomous outcome (yes/no). Strength of the scapular stabilizers and rotator cuff was assessed via manual muscle testing using a handheld dynamometer. Force measures obtained with the handheld dynamometer were used to quantify strength. For each muscle tested, the mean peak force of three trials were normalized to body weight and used for data analysis. Additionally, strength ratios were calculated and analyzed. Differences in strength and strength ratios between those with and without scapular dyskinesia were compared using separate two-way mixed ANOVAs with repeated measures.

Results: No significant differences for either strength ($F_{1,83,43,92} = 1.10$, $p = .34$) or strength ratios ($F_{1,83,44,02} = 1.93$, $p = .16$) were observed between those with and without scapular dyskinesia. A significant main effect ($F_{1,83,43,92} = 239.32$, $p < .01$) for muscles tested was observed, and post-hoc analysis revealed significant trends resulting in a generalized order: the upper trapezius generated the greatest amount of force, followed by serratus anterior and middle trapezius, lower trapezius, supraspinatus, medial rotators, and lateral rotators.

Conclusion: The results of this study indicate that differences in shoulder muscle strength do not exist between healthy subjects with and without scapular dyskinesia. Additionally, scapular dyskinesia appears to be prevalent in healthy populations.

Level of Evidence: Level 3

Key words: Muscular performance, rotator cuff, scapular dysfunction, scapular stabilizers, shoulder

CORRESPONDING AUTHOR

Daniel C. Hannah, MA, ATC
Rehabilitation Science, John G. Rangos, Sr.,
School of Health Sciences
Duquesne University
Pittsburgh, PA 15282
Phone: 412.396.4738
Fax: 412.396.4160
E-mail: hannahd@duq.edu

¹ Rehabilitation Science, John G. Rangos, Sr., School of Health Sciences, Duquesne University, Pittsburgh, PA, USA

² Department of Athletic Training, John G. Rangos, Sr., School of Health Sciences, Duquesne University, Pittsburgh, PA, USA

³ Department of Physical Therapy, John G. Rangos, Sr., School of Health Sciences, Duquesne University, Pittsburgh, PA, USA