Abstract

Background: The rotator cuff (RC) muscles, which include the supraspinatus, infraspinatus, subscapularis, and teres minor, are essential for shoulder stabilization. They play a significant role in maintaining shoulder stability through various mechanisms. An imbalance between agonist and antagonist muscle groups is identified as a significant risk factor for shoulder injuries, particularly when external rotator strength is compromised and grip strength is often used in rehabilitation to assess upper extremity function and has been shown to correlate with the strength of shoulder stabilizing muscles. One of the proposed mechanisms for shoulder injury is a result of rotator cuff fatigue which contributes to superior humeral head migration during arm elevation and causes impingement of the soft tissues in the sub acromial space during training activity. The present study aimed to find out the correlation between grip and shoulder rotators cuff strength in young adults.

Study design: This is a correlation study.

Methodology: Seventy-five subjects (52 males, 23 females) aged 18–30 years (mean age 20.94 ± 1.47 years) were included based on predefined inclusion criteria. Grip strength was assessed using a Baseline hand-held dynamometer, while shoulder external and internal rotator muscle strength was measured using a Hoggan MicroFET2 hand-held dynamometer.

Results: Spearman's correlation analysis revealed significant and strong positive correlations between grip strength and shoulder external rotator strength ($r = 0.530$, $P < 0.01$), and internal rotator strength ($r = 0.633$, $P < 0.01$). A strong correlation was also observed between shoulder external and internal rotator strength ($r = 0.534$, $P < 0.01$). On the right side, grip strength was strongly correlated with external ($r = 0.517$, $P < 0.001$) and internal rotator strength ($r = 0.613$, $P < 0.001$), with a strong ER–IR correlation ($r = 0.513$, $P < 0.001$). Similarly, on the left side, grip strength showed strong correlations with external ($r = 0.538$, $P < 0.001$) and internal rotator strength ($r = 0.659$, $P < 0.001$), and between ER and IR strength ($r = 0.545$, $P < 0.001$).

Conclusion: This study demonstrated significant strong positive correlations between grip strength and shoulder rotator strength in young adults. Bilateral correlations were observed between grip strength and external rotators and internal rotators. Strong correlations also existed between external and internal rotators bilaterally. These findings suggest grip strength assessment may serve as a practical screening tool for shoulder rotator strength evaluation in clinical and athletic settings among healthy young adults with normal BMI.

Keywords: Hand grip strength, shoulder rotator muscle strength, Handheld dynamometer, Correlation study.

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