A Comparison of Range of Motion, Strength, and Function in Patients with Rotator Cuff Tears with a Healthy Population

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Purpose: To determine the differences of shoulder active range of motion (AROM), strength, and function among patients presenting to physical therapy with a rotator cuff tear (RCT) with those of healthy subjects. Our hypothesis was that significant differences would exist between groups.

Number of Subjects: Eighty-one subjects presenting to physical therapy for initial evaluation with a documented rotator cuff tear and thirty-seven healthy volunteers.

Methods: At initial physical therapy evaluation all patients with an MRI documented rotator cuff tear completed the Penn Shoulder Score (PSS) and measures of AROM for forward elevation (FE), external rotation (ER) at 0 and 90° abduction, and internal rotation (IR) by the level of the hitchhiking thumb up the back. Shoulder strength was measured with a hand-held dynamometer for FE, ER, and IR. A group of healthy volunteers with no history of shoulder pain were screened for the absence of rotator cuff disease and completed the same measures.

Results: Of the 81 subjects with rotator cuff tears, there were 12 partial tears (P-RCT), 25 small tears (S-RCT), 20 medium tears (Me-RCT), 16 large tears (L-RCT), and 8 massive tears (Ma-RCT). There were 40 males and 41 females with rotator cuff tears with a mean age of 63.59. There were 16 males and 21 female healthy volunteers with a mean age of 54.57. Patient with partial and small tears were younger (51.92 and 61.44) than patients with medium, large, and massive tears (67.35, 67.94, 69.75). Significant differences were found for pain, satisfaction and total score of the PSS in the patients with rotator cuff tears compared to the healthy volunteers. Average PSS scores were 98.95, 63.75, 58.96, 54.35, 43.13, and 41.13 for normal, P-RCT, S-RCT, Me-RCT, L-RCT, and Ma-RCT respectively. Significant differences were found for all impairment measures between groups. The average AROM FE for RCT patients was 126.58 versus 157.89 for the healthy volunteers. The average strength for RCT patients versus healthy volunteers 17.8# vs. 37.23# for FE and 12.6 vs. 22.31.

Conclusions: Patients with rotator cuff tears present with significant impairment and functional loss when compared with healthy adults.

Clinical Relevance: Clinicians can use this information in the evaluation, prognosis, and treatment planning of patient presenting with rotator cuff tears.