CORRELATION OF POSTERIOR SHOULDER TIGHTNESS (PST) AND GLENOHUMERAL INTERNAL ROTATION DEFICIT (GIRD) AND CUT - OFF VALUES FOR THE DETERMINATION OF PST IN PATIENTS HAVING SUBACROMIAL IMPINGEMENT SYNDROME WITH GIRD

Halime Ezgi TÜRKSAN [1], Damla KARABAY [2], Sevgi Sevi YEŞİLYAPRAK [3], Mehmet ERDURAN [4]

[1]Institute of Health Sciences, School of Physical Therapy and Rehabilitation, Dokuz Eylül University, Izmir, Turkey

[2]Institute of Health Sciences, Dokuz Eylül University - Department of Physiotherapy and Rehabilitation, Health Sciences Faculty, Izmir Katip Celebi University, Izmir, Turkey.

[3]School of Physical Therapy and Rehabilitation, Dokuz Eylul University, Izmir, Turkey.

[4]Dokuz Eylul University Faculty of Medicine, Department of Orthopedy and Traumatology, Izmir, Turkey

PURPOSE: Posterior shoulder tightness (PST) have been associated with common shoulder disorders such as subacromial impingement syndrome (SIS) and labral tears in both the general and athletic population (1). Tyler et al. reported increased PST among individuals diagnosed with SIS when compared to controls (2). Ticker et al. reported an association between SIS and PST (3). Pathologic glenohumeral internal rotation deficit (GIRD) is defined as a loss of internal rotation ≥18°-20° compared to the contralateral side (4). Both GIRD and PST has been linked to increased superior migration of the humeral head that increases the stress on the RC and biceps tendons and labrum(5). Although GIRD is believed to associated with PST, GIRD may not demonstrate the full spectrum of PST. Besides, the cut-off point of the PST hasn't been investigated in the symptomatic population (3). Our purposes were first; to investigate the association between GIRD and PST, and second, determine the cut-off point value of the PST in patients having SIS with GIRD.

METHOD: 63 patients having SIS with GIRD (32 female, 31 male) were recruited for this investigation. PST was measured in the side-lying position with a bubble inclinometer (6). Using bubble inclinometer, GIRD was measured in the supine position by determining the difference between bilateral internal rotation range of motion (7). The association between GIRD and PST was determined with the Pearson correlation analysis. PST cut off value was determined by the mean ± 1SD method (8).

RESULTS: The mean age of the participants was 50.03 ± 12.99 (min-max= 21-73). The mean pain duration was 4.43 ± 3.18 months.

- There was no correlation between PST and GIRD in patients with SIS (r=-0.032, p=0.802).
- The PST test results were categorized as PST+ for those who had ≤35° and PST- for those who had ≥47°. In 63 patients, 7 patients were categorized as PST+ and 9 patients were categorized as PST-.
- The mean GIRD of PST+ and PST- patients were 24.93°±5.45, 25.22°±9.72, respectively. According to the Mann-Whitney U test, there was no significant difference in GIRD of PST+ and PST- patients (p=0.634).

DISCUSSION: Although it has been stated that there is an association between GIRD and PST in literature, we found no correlation between PST and GIRD in the symptomatic population. There was no significant difference in GIRD of PST+ (PST test result ≤35°) and PST- (PST test result ≥47°) patients. These findings can be attributed to the fact that different test positions stretch different structures. The capsule and glenohumeral ligament are primarily stretched by IR, but the capsule and posterior portion of the deltoid muscle are stretched by horizontal adduction movement (9).

According to the results of the present study, both GIRD and PST should be assessed in patients with SIS because they give information about different sturctures. That way, treatment can be planned according to the specific needs of the patiens. This study is a pilot study. Currently, we conduct this study with more SIS patients.

Keywords: *Posterior shoulder tightness, subacromial impingement syndrome, glenohumeral internal rotation deficit, the cut-off point*

1. **Salamh, Paul A., et al. Journal of shoulder and elbow surgery 28.1 (2019): 178-185.**
2. **Tyler TF,. orts Med. Sep-Oct 2000;28(5):668-673.**
3. **Ticker, Arthroscopy: The Journal of Arthroscopic & Related Surgery 16.1 (2000): 27-34.**
4. **Burkhart, " Arthroscopy 19.6 (2003): 641-661.**
5. **Matsen III, U.S. Patent No. 4,979,949. 25 Dec. 1990.**
6. **Kolber, North American journal of sports physical therapy: NAJSPT 5.4 (2010): 208.**
7. **Manske Sports Health 2.2 (2010): 94-100.**
8. **Borstad, Journal of orthopaedic & sports physical therapy 35.4 (2005): 227-238.**
9. **Muraki Clinical biomechanics 21.5 (2006): 474-480**