Acta Scientific Orthopaedics (ISSN: 2581-8635)

Volume 7 Issue 12 December 2024

Research Article

A Comparative Study on the Efficacy of Sleeper Stretch Over Cross Body Stretch on Dominant Shoulder Range of Motion Among Fast Bowlers

Mohamed Fayiz P and Bhojan Kannabiran*

Department of Sports Physiotherapy R.V.S College of Physiotherapy, Coimbatore, The Tamil Nadu Dr.M. G. R. Medical University, Chennai, India

***Corresponding Author:** Bhojan Kannabiran, Department of Sports Physiotherapy R.V.S College of Physiotherapy, Coimbatore, The Tamil Nadu Dr.M. G. R. Medical University, Chennai, India

DOI: 10.31080/ASOR.2024.07.1005

Received: August 13, 2024

Published: November 28, 2024

Abstract

Background: Individuals who engage in overhead activities are more likely to have shoulder tightness. For overhead athletes, stretching methods that target improving posterior shoulder soft tissue flexibility are frequently included in preventative and therapeutic regimens. The greatest stretching exercises to enhance posterior shoulder flexibility, glenohumeral joint internal rotation, and horizontal adduction range of motion in overhead athletes have been shown to be sleeper stretching and cross-body stretching exercises.

Methodology: The aim of the research is to determine whether sleeper stretches are more efficacy than cross-body stretches for increasing shoulder range of motion in dominant hand of fast bowlers. For this study, forty bowlers from Coimbatore were chosen based on their data. Two groups of patients were formed. Stretching exercises for the sleeper were given to Group A, and cross-body stretches were given to Group B. Goniometer measurements of Group A and B's test results before and after. The duration of the interventions was six weeks. The paired "t" test was employed inside the group comparison, and the unpaired "t" test was utilized between the group comparisons. The results were obtained by the application of statistical methods and statistical software, SPSS.

Result: There was a significant improvement in dominant shoulder internal and external range of motion of fast bowlers by applying sleeper stretch than cross body stretch.

Conclusion: This study concluded that sleeper stretching technique is more significant in improving shoulder internal and external range of motion compared to cross body stretching in fast bowlers.

Keywords: Overhead Throwing; Posterior Shoulder Tightness; Sleeper Stretch; Cross Body Stretch; Goniometer

Introduction

When throwing something overhead, one must use their internal rotators to propel the object into space while maintaining a considerable upper limb activity and keeping their arm away from their trunk [1]**.** During the throwing motion, the athlete's shoulder joint complex experiences repeated micro-traumatic stress, which challenges the physiologic capabilities of the surrounding tissues. Tissue breakdown and damage can frequently be caused by abnormalities in throwing mechanics, muscle tiredness, weakness, or imbalance, as well as excessive capsular laxity. The glenoid capsule, labrum, and rotator cuff muscles are frequently injured in these injuries [2]**.** In sports like baseball, volleyball, and tennis that require overhead movement, it is common to observe glenohumeral internal rotation deficit (GIRD) and posterior shoulder tightness (PST) [3]**.**

GIRD is generally defined as decreased internal rotation range of motion in the dominant arm compared with the non-dominant side [4]**.** Commonly, GIRD is described as the dominant arm's diminished

internal rotation range of motion in comparison to the non-dominant side. The posterior glenohumeral capsule's thickening and the posterior muscles like posterior deltoid, infraspinatus, and teres minor being stiff or shortened, respectively, are the mechanisms underlying these anomalies [5]. Increased stiffness of posterior components can be brought on by repeated tensile stress during the throw-through phase, which can lead to inflammation and scarring [6].

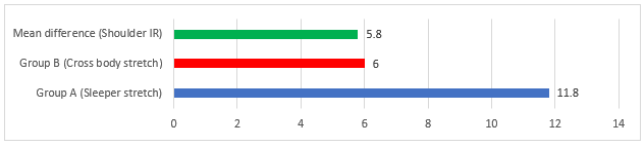
Strong, web-like connective tissue called fascia envelops and shields muscles, veins, organs, nerves, and bones. The tissue is composed of many cell types, fiber kinds, and ground materials. Three layers comprise the fascia: the surface, potential space, and deep layers. Each layer has fibers that are oriented differently and run-in various directions. It acts as a cushion, enveloping the entire body and offering stability and support. The fascia tightens in traumatic areas to shield the underlying muscles from injury. Web connective tissue is constrained across the body as a result of fascia tightening in one area. This can lead to a general loss of function because of things like weakening and bad posture, which both hurt range of motion [7]. There are several throwing phases, such as wind up, follow-through, early and late cocking, acceleration, and deceleration. The anterior capsule suffers significant strain during the late cocking period to prevent anterior humerus translation. Throwing repetitively is thought to cause tensile failure and anterior capsule attenuation. The posterior capsule undergoes a significant eccentric load during the follow-through phase to slow down the rapid internal rotation of shoulder and limit the significant distracting force observed at the posterior shoulder joint [8].

In hurling sports, bone adaptations often show up as improved humeral retroversion. This motion has been demonstrated to reduced shoulder internal rotation while increasing external rotation, maintaining the same total arc of motion. The deceleration phase of the throwing motion is a major contributor to the development of posterior shoulder soft tissue tightness, as the humerus internally rotates during the follow- through phase of the throwing motion; the posterior inferior capsule may be placed in a primary location to resist the deceleration phase, acting as direct restraints on these loads. The accumulation of such stresses may produce tightness in the posterior capsule and other dynamic restraints such as the, teres minor, latissimus, posterior part of deltoid and resulting in alteration of range of motion [9]. Posterior structures tightening especially posterior capsule may be the cause of or a contributing factor in shoulder, labral lesions, impingement syndrome and cuff disease. With passive shoulder elevation, the humeral head is translated anteriorly and superiorly when the posterior area of the shoulder capsule is selectively tightened. Diminishing subacromial space during overhead jobs may result from abnormal humeral head motion. Shoulder flexion, medial rotation, and horizontal adduction may be lessened as a result of the acromion and humeral head's close closeness, which might compress relevant tissues [10].

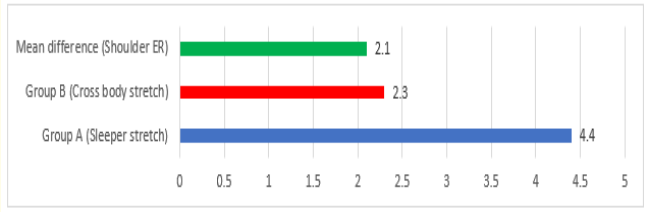
As an objective way to quantify range of motion at synovial joints, goniometric readings are commonly used in rehabilitation. Goniometric measurement reliability is critical because quantifiable baseline joint mobility must be established before rehabilitation treatments start, as well as measures of increased joint mobility throughout treatment and treatment outcomes. Repeated evaluations are necessary to achieve this [11]. Stretching your body across in this form of stretching, the person passively draws their humerus across their body and into a horizontal adduction with their opposing arm [12]. An individual performing a sleeper stretch elevates their humerus to 90 degrees on a support surface, passively rotates it internally with the opposing arm, and then lies on the side that needs to be stretched [13].

Methodology

Review Board of RVS College of Physiotherapy, Coimbatore has approved this comparative study and a written consent was obtained from the participants after giving clear instructions regarding the procedure and its implications. This study was conducted in physiotherapy outpatient department of RVS College of Physiotherapy, Sulur, Coimbatore. 40 male fast bowlers between 20 to 35 years were selected for the comparative study, equally divides into two groups. Pre and Post shoulder internal and external range of motion is measured by using goniometer. Group A treated with Sleeper stretching and Group B treated with Cross body stretching. The values were analyzed by application of statistical methods and statistical software, SPSS.



Graph 1: Shows the illustration of the mean and mean difference values of shoulder internal rotation ROM for groups A and B.



Graph 2: Shows the illustration of the mean and mean difference values of shoulder external rotation ROM for groups A and B.

The Graph 1 and 2 shows an illustration of the mean and mean difference values of shoulder internal and external rotation ROM for groups A and B. When the mean values of groups A and B were compared, Group A patients who were treated with sleeper stretching exercises had a greater difference than Group B. As a result, sleeper stretching exercise are more helpful than cross body stretching exercises in enhancing fast bowlers' shoulder Internal and external rotation range of motion.

Discussion

Sleeper stretching exercises greatly increased fast bowlers' shoulder internal and external rotation range of motion. More isolation of the posterior glenohumeral joint is made possible by the side-lying position, which stabilizes the scapula against the upper body and the treatment surface. The posterior glenoid and humerus separate as a result of the stretch stress being restricted to the posterior soft tissue of the glenohumeral joint, lengthening the posterior shoulder structures. The mechanical or structural characteristics of the muscle or tendon are one way by which stretching may improve range of motion. Among the structural alterations include tendon lengthening and changes in muscle architecture brought about by the elongation of muscular fascicles and fascia. Stretching activates the neural system, which causes the muscle to relax and permits the fascia to adjust. Over time, the adaptation may result in longer and better range of motion due to the realignment of collagen fibers inside the fascia.

Jakson *et al*. (2013*)* carried out a contrasting investigation on the instant effects of sleeper stretch and cross-body stretch on volleyball players' shoulder range of motion, which supported this conclusion. Sixty college-level volleyball players were split into two groups: group A received treatment with sleeper stretches and group B received cross-body stretches for three sets with a 30-second break in between. Using a goniometer, the shoulder's internal rotation and horizontal adduction were measured. The results showed that group A, who received sleeper stretching exercises, had a substantial improvement in posterior shoulder tightness. This improvement may have been caused by improved scapular stabilization, which allowed the posterior soft tissues of the GH joint to be effectively stretched [14]**.** Heta et al.'s study, which compared the impact of sleeper stretching technique effect on range of motion and patient-specific function, and the ratio of glenohumeral external rotation gain to glenohumeral internal rotation deficit in asymptomatic tennis players, further corroborated it. Thirty tennis players were split into two groups: group B received cross-body stretching activities for two weeks, while group A received sleeper stretching exercises five days a week. Three PSFS scale activities, the GIRD/GERG ratio, and pre- and post-measurements of the glenohumeral internal and external rotation were performed. The results showed that the sleeper stretch improved the GIRD/GERG ratio and internal and exterior rotation ROM in a statistically significant way [15]**.**

According to Aldridge *et al*. (2012) and the author, sleeper stretching can help collegiate baseball players' throwing shoulders achieve greater passive internal rotation range of motion (ROM) and total arc. A stretching regimen of this kind can lengthen the posterior rotator cuff and enhance passive IR ROM, all of which can help minimize lost performance time from shoulder injuries. Since stretching might help collegiate baseball players cut down on the number of innings, they miss due to injuries [16]**.** Another study by Kevin et al. found that sleeper stretches resulted in negligible clinical improvements but a statistically significant acute

increase in posterior shoulder ROM and internal shoulder rotation in baseball players' dominant arms. The results of the author's immediate post-sleeper stretch ROM checks do not support the notion that a sleeper stretch causes a significant, immediate increase in shoulder ROM. According to the author's research, stretches aim to extend soft tissue restriction in order to improve throwing velocity, control, and reduce the likelihood of injury and stiffness in the muscles. Thus, there is no support for this study. Ultimately, this study shows that asymptomatic tennis players have higher glenohumeral IR ROM [17].

Conclusion

The purpose of the study was to determine if sleeper stretches or cross-body stretches were more effective at increasing fast bowlers' dominant shoulder range of motion. This study involved 40 fast bowlers who were split into two groups at random. Exercises involving sleeper stretching were administered to Group A, whereas cross-body stretching was administered to Group B.

Both groups' shoulder internal and external ranges of motion have significantly improved, according to the statistical findings. Yet, when compared to the mean value, it is discovered that sleeper stretching exercises are superior to cross-body stretching exercises in terms of helping fast bowlers' Range of motion for the dominant shoulder both internally and externally.

Bibliography

1. Thomas SJ., *et al*. "Neuromuscular and stiffness adaptations in division 1 collegiate baseball players". *Journal of Electromyography and Kinesiology* 23 (2013): 102-109.

2. Kevin E Wilk., *et al*. *The American Journal of Sports Medicine* 30.1 (2002).

3. Hibberd EE., *et al*. "Increase in humeral retro torsion accounts for age-related increase in glenohumeral internal rotation deficit in youth and adolescent baseball players". *The American Journal of Sports Medicine* 42.4 (2014): 851-858.

4. Whiteley R and Oceguera M. "GIRD, TRROM, and humeral torsion-based classification of shoulder risk in throwing athletes are not in agreement and should not be used interchangeably". *Journal of Science and Medicine in Sport* 19.10 (2016): 816-819.

5. Mihata T., *et al*. "Effect of posterior shoulder tightness on internal impingement in a cadaveric model of throwing". *Knee Surgery, Sports Traumatology, Arthroscopy* 23.2 (2015): 548-554.

6. Davis KW. "Imaging pediatric sports injuries: upper extremity". *Radiologic Clinics of North America* 48.6 (2010): 1199-1211.

7. McKenney K., *et al*. "Myofascial Release as a Treatment for Orthopaedic Conditions: A Systematic Review". *Journal of Athletic Training* 48.4 (2013): 522-527.

8. Borsa PA., *et al*. "Mobility and stability adaptation in the shoulder of the overhead athlete: a theoretical and evidence-based perspective". *Sport Medicine* 38 (2008): 17-36.

9. Pappas AM., *et al*. "Rehabilitation of the pitching shoulder". *The American Journal of Sports Medicine* 13.4 (1985): 223-235.

10. Harryman DT., *et al*. "Translation of the humeral head on the glenoid with passive glenohumeral motion". *Journal of Bone and Joint Surgery* 72 (1990): 1334-1343.

11. Rose MB and Noonan T. "Glenohumeral internal rotation deficit in throwing athletes: current perspectives". *Open Access Journal of Sports Medicine* 9 (2018): 69.

12. Joyce S Sabari., *et al*. "Goniometric Assessment of Shoulder Range of Motion: Comparison of Testing in Supine and Sitting Positions". *Archives of Physical Medicine and Rehabilitation* 79 (1998): 647-651.

13. Kevin G Laudner., *et al*. "The acute Effect of Sleeper Stretches on Shoulder Range of motion". *Journal Athletic Training* 43.4 (2008): 359-363.

14. Jakson K Joseph. "The immediate effect of sleeper stretches on shoulder range of motion in volley ball players". (2013).

15. Dr. Heta B Kotak., *et al*. "Effect of sleeper stretch technique on range of motion, patient specific function and glenohumeral internal rotation deficit / glenohumeral external rotation gain ratio in asymptomatic tennis players". (2021).

16. Roy Aldridge J., *et al*. "The Effects of a Daily Stretching Protocol on Passive Glenohumeral Internal Rotation in Overhead Throwing Collegiate Athletes". *The International Journal of Sports Physical Therapy* 7.4 (2012): 365.

17. Kevin G Laudner., *et al*. "The acute Effect of Sleeper Stretches on Shoulder Range of motion". *Journal Athletic Training* 43.4 (2008): 359-363.