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Effectiveness of Active Releasing Technique Vs Mulligan Bent Leg Raise for Footballers with Hamstring Tightness

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ABSTRACT

BACKGROUND: Hamstring tightness is common among football players, which frequently results in hamstring injuries. Although the exact cause of hamstring tightness is unknown, decreased hamstring extensibility may play a role. Stretching techniques of various types have been used to improve muscle flexibility in rehabilitation and sports. Passive stretching is one of the most commonly used methods, and the recent addition of other techniques such as ballistic stretching, Proprioceptive Neuromuscular Facilitation (PNF) techniques with variants have been effective. The current study aimed to compare the effects of Active releasing technique and Mulligan bent leg raise in footballers with hamstring tightness.

AIM AND OBJECTIVE: To determine the effectiveness of Active releasing technique and Mulligan bent leg raise in reducing hamstring tightness among football players.

METHOD: STUDY DESIGN: Experimental study. SAMPLING TECHNIQUE: Convenient Sampling technique. SAMPLE SIZE: 20 FOOTBALL PLAYERS.

RESULT: The values were statistically analysed using paired ‘t-test and the Unpaired ‘t-test. The statistical analysis made with the quantitative data revealed a statistically significant difference between Group A and Group B and also within the group. The post-test mean value of sit and reach flexibility test of group A was 29.40 and group B was 28.50. This showed that the treatment given for group A is comparatively more effective than group B.

CONCLUSION: This study shows that there was an improvement in hamstring flexibility in Active release technique as well as Mulligan bent leg raise among footballers with hamstring tightness. However, Active release technique is better as compared to Mulligan bent leg raise technique to improve hamstring flexibility and range of motion in footballers.

KEYWORDS: Hamstring tightness, Active release technique, Mulligan bent leg raise, Footballers.

INTRODUCTION:

Muscular flexibility is essential for normal human function. Limited flexibility has been shown to predispose a person to a variety of musculoskeletal overuse injuries and to have a significant impact on a person's level of function. (1) Muscular tightness is frequently proposed as an inherent risk factor for muscle injury development. A lack of flexibility has been proposed as a risk factor for hamstring strains.[2] Reduced hamstring flexibility is thought to be one of the risk factors for hamstring strains, and hamstring stretches are commonly used as part of a pre-exercise routine, usually following an aerobic warm-up among footballers (3). Common people and athletes alike frequently struggle with flexibility problems, especially when it comes to the hamstring muscle group. Hamstring tightness can cause a variety of other musculoskeletal issues in addition to reducing range of motion. Muscle tightness has an impact on the length-tension relationship of the muscle as well as the limb's capacity to absorb trauma. Reduced flexibility creates a vicious cycle where range is reduced and postural issues grow as a result. Additionally, tight muscles restrict blood flow and lessen performance. (4) The lumbar pelvic rhythm is influenced by tight hamstrings as well. Patellar tendinopathy, patellofemoral pain syndrome, and plantar fasciitis are all linked to hamstring tightness. Studies demonstrating a favourable correlation between hamstring tightness and severity of low back pain also identified a link between hamstring tension and mechanical low back pain. (5) The primary cause of muscular tightness is a decrease in the muscle's capacity to deform, which results in a smaller range of motion at the involved joint. Hamstring tightness is linked to a faulty motor control pattern that causes postural muscles to fire below their maximum potential, which causes the hamstrings to serve as stabilizers instead of their primary function as prime movers. Hamstring tightness manifests as a result of this modification in main function. (6) Worrell and Perrin (1992) proposed a theoretical model for hamstring strains that suggested that they are the result of a complex interaction between four etiologic factors: warm-up, strength, fatigue, and flexibility. Stretching motivations stem from the belief that stretching exercises will increase flexibility and decrease muscle stiffness. Maintaining normal muscle length necessitates regular stretching to avoid muscle stiffness, reduce the risk of musculoskeletal injuries, and improve physical performance. Maintaining hamstring muscle flexibility is important for the general and athletic population, as well as for health care professionals. To achieve this goal, one must first learn the most effective and efficient technique for gaining hamstring flexibility. (6)

The active release technique, or ART, was developed by chiropractor Dr. P. Michael Leahy to treat a variety of muscle, tendon, ligament, fascia, and nerve issues, according to Austin Sports Therapy. ART treatments, according to Austin Sports Therapy, include tension or massage as well as guided movements.

Active release technique therapy for the hamstrings is intended to relieve pain and tightness while also assisting the hamstring in returning to its normal state. [7] Active release technique has three distinct goals: restoring free and unhindered soft tissue movement, releasing entrapped nerves, vasculature, and lymphatics, and re-establishing optimal texture, resilience, and function of soft tissues. [7] Three distinct goals are intended to be achieved by Active Release Technique: restoring free and unhindered mobility of all soft tissues; releasing imprisoned lymphatics, nerves, and vasculature; and restoring the ideal texture, resilience, and function of soft tissues. [8] A study was conducted to demonstrate that a single session of Active release technique treatment is effective in improving hamstring flexibility in a group of healthy, active male participants. ART is a soft tissue based system that effectively treats issues involving muscles, tendons, ligaments, fascia and nerves. [8,9] Studies on alternative stretching techniques, such as ballistic stretching in athletes or Proprioceptive Neuromuscular Facilitation (PNF) stretching, also shed considerable light on the techniques accessible for enhancing hamstring flexibility. [9] By removing adhesions and regaining the soft tissue's integrity, ART therapy is effective. In theory, this is accomplished by keeping contact with the adhesive while the muscle is shortened and lengthening the muscle along the fiber orientation to dislodge the adhesion. The cumulative injury cycle, a self-reinforcing loop that illustrates how acute injuries and soft tissue injuries can become chronic disorders, describes how the effect of active release method depends on soft tissue injuries. It is fairly simple to observe how each component contributes to or keeps the cycle of harm going as we go around it. [10] It is a Mulligan, Bent Leg Raise; A recent development in the treatment of hamstring tightness seems to be the stretching approach. It is a painless and helpful method that is recommended for hamstring tightness that prevents one from performing a Straight Leg Lift (SLR). Even people with limited or uncomfortable SLR and low back pain can try it. Even if a patient has leg pain above the knee, they can still attempt it, and it is quite beneficial to those who have severe bilateral restriction in straight leg lift. [11] According to Mulligan, a painless technique can be applied to any athlete who has limited or painful straight leg raising (SLR). It can be tried on patients who have a severe bilateral restricted straight leg raise (SLR). If the bent leg raise (BLR) cannot be performed without pain, it should not be used. [12] Bent leg raise technique involves the use of isometrics to hamstrings in specific directions that may improve the flexibility of hamstrings by increasing range of motion (ROM) of knee extension. Mulligan exercised the patients' muscles while they were moving, either actively or passively, or while they were inhibited from contracting. The Mulligan's Traction Straight Leg Raise (TSLR) and Bent Leg Raise (BLR) procedures should be used when there is restricted hip flexion range of motion and low back discomfort, either with or without referred leg pain. The goal of this method is to regain regular movement. It stretches the hamstring, adductor, and rotator muscles of the lower extremities together. [13] Various different studies proved the

effectiveness of active releasing technique (ART) and Mulligan bent leg raise technique (BLR) independently in improving the hamstring flexibility among the regular population with hamstring tightness using various mechanisms. [13,14] Previous research has shown that ART and Mulligan bent leg are effective in improving hamstring flexibility among athletes. [14] However, there has been little research comparing these two techniques, ART and Mulligan bent leg raise, for hamstring muscle tightness, especially the tightness seen in footballers who undergo a lot of vigorous active knee and hip movements. As a result, the purpose of this research is to investigate and compare the efficacy of Active release technique and Mulligan bent leg raise among footballers with hamstring tightness. [15]

METHODOLOGY:

The subjects were selected based on inclusion and exclusion criteria. The subjects are then classified into Group A and Group B. Group A was given Active releasing technique and group B received Mulligan bent leg raise. The study was explained to the subjects and Written consent was obtained from the subjects. Popliteal angle along with sit and reach flexibility score is used to assess the degree of hamstring tightness. All the subjects underwent pre-test measurement with sit and reach flexibility test. The post-test measurements were taken at the end of 4th week ok intervention.

The subjects received Active releasing technique(n=10) and Mulligan bent leg raise(n=10) for 1 session 3days/week for 4weeks. Subjects were reassessed by a physiotherapist after the end of the 4th week to measure the hamstring tightness in football players.

STUDY DESIGN: Experimental study

SAMPLES: 20

SAMPLING TECHNIQUE: Convenient sampling

INCLUSION CRITERIA:

- Both the genders aged 18-25 years
- 20^{o} restriction in SLR unilaterally
- Regular football players

EXCLUSION CRITERIA:

- Patients who were not interested in the study
- History of lower extremity injury
- Any recent surgery in the lower extremity

STATISTICAL ANALYSIS:

The values were statistically analyzed using paired ‘t-test and the Unpaired ‘t-test. Statistical analysis made with the quantitative data obtained from popliteal angle measurements and sit and reach flexibility test revealed a statistically significant difference between Group A and Group B and also within the group

TABLE 4: Comparison between the post-test values of Group A and Group B using Popliteal Angle measurements

POST TEST	MEAN	STANDARD DEVIATION	t- test	P- value
Group A	23.50	5.23	16.4762	<0.001
Group B	19.60	3.75	23.8984	

TABLE 5: Comparison between the post-test values of Group A and Group B using Sit and reach scores

POST TEST	MEAN	STANDARD DEVIATION	t- test	P- value
Group A	29.40	3.78	6.6533	<0.001
Group B	28.50	4.09	4.7385	

RESULT:

The statistical analysis made with quantitative data obtained from popliteal angle measurements and sit and reach flexibility test revealed statistically differences between Group A and Group B and also within the group. The post-test mean value of popliteal angle in Group A was 23.5 and Group B was 19.6 respectively. The post-test mean value of Sit and reach test in the Group A was 29.4 and Group B was 28.5 respectively.

DISCUSSION:

Regular stretching can keep the hamstring muscle from becoming tighter and shorter, which can result in muscle "knots". In order to fully stretch the muscle and recover flexibility for functional use, the scar tissue adhesions are released using the active release technique and the Mulligan bent leg rise technique. [23 The sit and reach test's reproducibility and criteria-related validity have a coefficient of variation (CV) of 8.74 percent and an intraclass correlation coefficient (ICC) of 0.92. This was demonstrated in a study of recreationally active young adults conducted by Ayala et al to estimate hamstring flexibility. [23] D. Scott Davis's study on the concurrent validity of four clinical tests identified the Active knee extension/Popliteal angle test as the gold standard for measuring hamstring flexibility, with an intratester reliability (ICC) of 0.94.[25] Waseem et al. conducted a study comparing static stretching to eccentric stretching on popliteal angle in normal healthy participants. The pre-test and post-test Popliteal angle values for the groups revealed a significant improvement in both groups, but static stretching revealed no improvement muscle. As a result, these techniques are effective individually in improving Hamstring flexibility. [26] James W. George et al. conducted the research (2006) demonstrated increased flexibility and range of motion of hamstring muscle immediately following ART treatment. Our research yielded the same conclusion with increased flexibility and range of motion. The Active Release Technique (ART), created by Dr. Michael Leahy proposed a system to explain the increased stiffness or tension in the tissue referred to as the cumulative injury cycle During this cycle, Repetitive micro-injury in tense muscles causes an increase in internal friction and tension myofascial structures Mulligan bent leg raise, on the other hand, The Popliteal angle differed significantly and sit and achieve flexibility before and after intervention conducted a study. [26] Worrell and Perrin (1992) proposed a theoretical model for hamstring strains that suggested that they are the result of a complex interaction between four etiologic factors: warm-up, strength, fatigue, and flexibility [27]. Stretching motivations stem from the belief that stretching exercises will increase flexibility and decrease muscle stiffness. Maintaining normal muscle length necessitates regular stretching to avoid muscle stiffness, reduce the risk of musculoskeletal injuries, and improve physical performance. [27] By removing adhesions and

regaining the soft tissue's integrity, ART therapy is effective. In theory, this is accomplished by keeping contact with the adhesive while the muscle is shortened and lengthening the muscle along the fiber orientation to dislodge the adhesion. The cumulative injury cycle, a self-reinforcing loop that illustrates how acute injuries and soft tissue injuries can become chronic disorders, describes how the effect of active release method depends on soft tissue injuries. It is fairly simple to observe how each component contributes to or keeps the cycle of harm going as we go around it. [27]Earlier research by Halberstam et al (1999), which found that the acute effects of repetitive passive stretching are minimal. On the other hand, Volkert et al17 (2003) discovered a considerable increase in hamstring length during static stretching. According to the findings of Toby Hall et al11 (2005), Mulligan's BLR approach did not result in rapid improvement but was beneficial in extending the range of the straight leg raise (SLR) after 24 hours. The effectiveness of BLR or active release technique on hamstring flexibility was explored by Kage et al. They applied the BLR approach in a single session (3 reps per set). Both methods significantly increased the knee's range of motion and hamstring muscle flexibility (p 0.001). [28] Maintaining hamstring muscle flexibility is important for the general and athletic population, as well as for health care professionals. To achieve this goal, one must first learn the most effective and efficient technique for gaining hamstring flexibility. Therefore, the findings of this study showed that ART and Mulligan BLR increase hamstring flexibility up to various degrees among football players following intervention. Popliteal angle and sit-and-reach flexibility tests revealed improvement in both Experimental and Control groups by using ART and Mulligan bent leg raise respectively. [28] This study concludes that Active releasing technique is more effective in improving hamstring flexibility and range of motion of knee among football players with hamstring tightness when compared to Mulligan bent leg raise technique.

CONCLUSION:

From this result, it has been concluded that active releasing technique given to the Group A was found more effective than mulligan bent leg raise given to Group B, in improving hamstring flexibility and thereby leading to faster recovery in football players with hamstring tightness.

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