



## EFFECTS OF SELF MYOFASCIAL RELEASE AND STATIC STRETCHING ON HAMSTRING FLEXIBILITY AMONG THE MALE ATHLETES – A COMPARITIVE STUDY

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### ABSTRACT

**Background:** The effect of myofascial release and static stretching shows significant changes in the hamstring flexibility. **Aim and Objective:** To compare the effectiveness of self-myofascial release and static stretching on hamstring flexibility on adult male athletes. **Methods:** 56 Participants were divided into two groups 28 in each. Group A were allowed to do hamstring stretching with foam roller. Group B were allowed to do hamstring stretching with foam roller and static stretching for about 20 secs with 3 repetitions for four times in a week for a month. Hamstring flexibility was checked for both groups before and after the study and statistically analysed. **Results:** Group A right leg mean post value is 70.46 and left leg mean post value is 71.39. Group B right leg mean post value is 71.93 and left leg mean post value is 73.04. **Conclusion:** This study concludes, after the interventions the hamstring flexibility was markedly increased for both groups. But comparatively group B shows better changes in hamstring flexibility.

### KEY WORDS

Hamstring flexibility, foam roller, static stretching, athletes, self-myofascial release

### INTRODUCTION

Flexibility is considered as the essential component of injury prevention and rehabilitation<sup>1</sup>. Flexibility is the ability to move the muscles and joints through their full range of motion. Flexibility depends upon number of factors. Factors can change the frequency and intensity of stretching, choosing the right exercises and executing them correctly, increasing strength with flexibility. Factors which cannot change the genetics, body structure, a serious injury or disability, age, and gender. YAN HO CHEUNG et al stated that flexibility is not a general characteristic that someone possesses but it is specific to each area of the body. Body has the ability to briefly store and utilize the tension created by a rapid muscle stretch. An example to the stretch-shortening cycle is an elastic band. When an elastic material is

stretched, it becomes taut and ready to snap back with force when released. The more pliable the elastic and farther can stretch it, the force it will generate when released<sup>2</sup>. The muscles in the body, has slightly have same process, based on the same principle. When a muscle lengthens rapidly, it stores a reserve of potential kinetic energy, which can be delivered much more effectively and with less expenditure of effort than a simple concentric contraction<sup>3</sup>.

Athletes have intense muscle strain for a period as a result of their strenuous training routines, repetitive movements and lifestyles<sup>1</sup>. But there is a method in which fascial tissue can be manipulated by stretching protocol. Athletes are more concerned about increasing or maintaining flexibility because it can help to prevent injury or to be fit. The author Clark, Sutton and Lucett in

2014 resulted that the flexibility training not only prevents injury, it can also improve muscular imbalance, improve neuromuscular efficiency and function, increase muscle extensibility and relieve excessive tension of muscles and joint stress<sup>4</sup>.

Hamstring is considered to be a Mobilizer muscle of the hip and knee joint and most common muscle to shorten in muscle length. Hamstring injuries are common occurrence among the sports persons because of fast acceleration. Hamstring strains can occur at either the proximal attachment site on the ischial tuberosity, the distal insertion site or in the muscle belly<sup>5</sup>. A tight hamstring can cause lot of biomechanical and postural changes and can affect function and increase the risk of injury and the stretching protocols become a part of individualized rehabilitation programme.

There are many factors and reasons for reduced joint range of motion but one of the common cause will be the muscular tightness. Muscular tightness results from increase in tension active or passive mechanisms. Passively, muscles become shortened through postural adaptation or scarring; actively by shorter due to spasm or contraction. Depends upon the causes, tightness limits range of motion and may create muscular imbalance. Stretching is used to increase the extensibility of muscles and it is a common activity practiced by athletes, older adults, rehabilitation patients and a fitness practitioner<sup>6</sup>.

The Patrick keys in 2011 stated that many stretching methods have been used to help individuals to increase flexibility in muscles and joints. The most common extremely effective and popular is static stretching involves a slow and constant stretch [i.e. taking a muscle to a point of tension and holding the position for a period of time].<sup>7</sup> Foam roller is a device that has been used to increase flexibility prior to physical activity. The foam roller is a dense cylinder that a person rolls their body weight over to increase range of motion for a specific body region, as a type of self-massage. The rolling motion produces a lengthening and release the fascia along with the breakdown of scar tissue and adhesion to muscle, improve quality of movement, decrease muscle tone and overactive muscles. Foam rollers are becoming popular in fitness clinics and athletic training purpose for their easy use, versatility and proposed result.

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## MATERIALS AND METHODS

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### Active knee extension test procedure

The fibular head and the lateral malleolus were marked, and a marking was made from greater trochanter towards lateral femoral epicondyle using a tape measure (cm).

The goniometer was placed with fulcrum on the lateral femoral condyle and stationary arm parallel to line joining greater trochanter and lateral femoral epicondyle and the moving arm parallel to a line joining the fibular head and lateral malleolus.

Active knee extension measurements were taken with the subject starting in supine with the test hip at 90 degrees of knee flexion measured using a goniometer, while the other leg was resting flat on the treatment table.

### PROCEDURE:

In this study 75 athletes from different areas were selected and after getting informed consent from the subjects and based on the inclusion and exclusion criteria 56 subjects are selected and allocated randomly in 2 groups (Group A and Group B).

Group A and Group B were allocated with 28 participants in each.

Active knee extension test with the goniometer was taken for the both groups before the application of technique.

Group A were allowed to do hamstring stretching with Foam roller for about 20 seconds in each 3 repetitions, four times in a week.

Group B were allowed to do hamstring stretching with Foam roller and static stretching for about 20 seconds in each 3 repetitions, four times in a week.

### Group A

#### FOAM ROLLER TECHNIQUE:

##### PATIENT POSITION – long sitting.

The subjects were instructed to place the thigh on the foam roller and asked to roll the foam roller for 20 secs per repetition. Foam roller can be performed for both leg. While performing the foam rolling the subject were asked to sustain the knee extension of the foam rolling leg.

This should be repeated for 3 times per session for both legs.

### GROUP B

#### FOAM ROLLER TECHNIQUE:

##### PATIENT POSITION – long sitting.

The subjects were instructed to place the thigh on the foam roller and asked to roll the foam roller for 20 secs

per repetition. Foam roller can be performed for both leg. While performing the foam rolling the subject were asked to sustain the knee extension of the foam rolling leg.

This should be repeated for 3 times per session for both legs.

#### STATIC STRETCHING TECHNIQUE:

**PATIENT POSITION** – Standing.

The subjects were asked to place their leg on an elevated surface with their knee extend and their ankle neutral. Subjects were instructed to lean forward, with their spine in neutral until a stretch was felt in the posterior thigh and hold for 20 secs and release.

This should be repeated for 3 times per session for both legs.

Subjects were followed up for a period of 4 days in a week for 4 weeks.

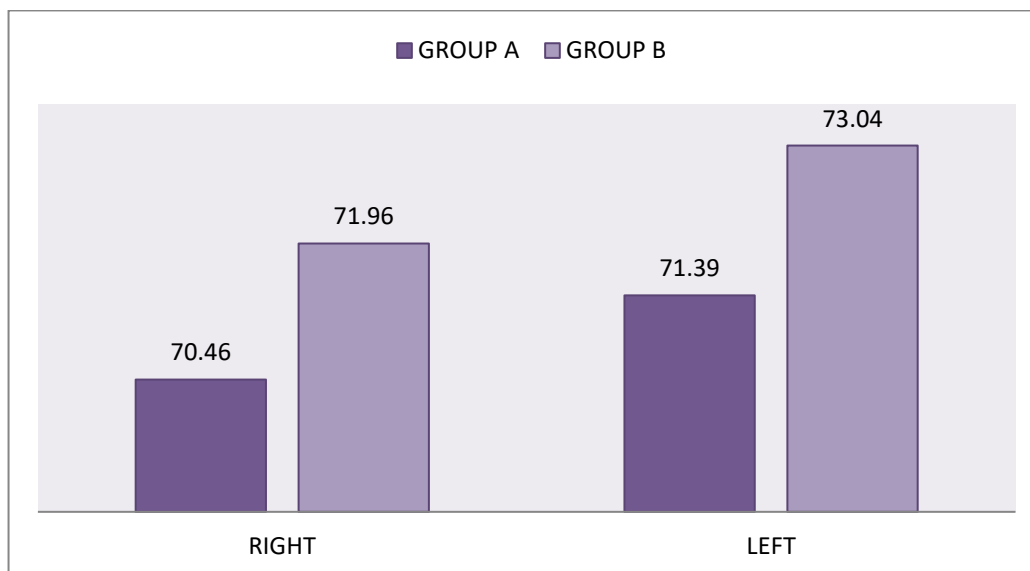
After 4 weeks of intervention, again goniometric values were taken (posttest). Than pretest and posttest values were tabulated and analyzed statistically.

**TABLE 1: GROUP A & GROUP B POST VALUES**

	GROUP A	GROUP B
RIGHT	70.46	71.96
LEFT	71.39	73.04

#### RESULT:

Table 1, Right leg (Mean Pre-Value=69.29, Mean Post Value=70.46), left leg: (Mean Pre-Value=70.02, Mean Post Value= 71.39); Right leg: (Mean Pre-Value=68.86, Mean Post Value=71.93), left leg: (Mean Pre-Value=69.96, Mean Post Value= 73.04).



**GRAPH 1 : SHOWS THE POST TEST VALUES OF GROUP A AND GROUP B FOR BOTH LEGS**

#### DISCUSSION

Flexibility can be affected by many factors, including genetics, connective tissue elasticity, composition of tendons, joint structure, strength of opposing muscle groups, body composition, sex, age, activity level, previous injuries and repetitive movements.

The study collected age, sex and activity level of the participants but each group did not have a large enough sample size to get an accurate result from age and activity level. Thus, it did not analyse the effect of gender and activity level on flexibility. Foam rolling, and static stretching can increase flexibility significantly.

Thus, the combination of foam rolling, and static stretch could be the best flexibility training technique. It

could provide the best immediate effect of flexibility improvement. Despite the fact that foam rolling and static stretch both belong to corrective flexibility training, their functions are not exactly the same. Therefore, doing both as flexibility training is good for long- term health.

#### Limitations

- The duration of the study was 4 weeks.
- The sample size of the study was small.
- Female athletes were not included.

#### Recommendations

- The intervention can be given for a longer duration for more accurate results.

- Sample size should be higher for generalization.
- Female athletes can also include the further study.
- The other outcome measures like YMCA Sit and Reach test can be including for accurate results.
- To increase in therapies combining different training principles, and different training techniques.

## CONCLUSION

Flexibility is considered as the essential component of injury prevention and rehabilitation. Flexibility is the ability to move the muscles and joints through their full range of motion. Flexibility depends upon number of factors. Factors can change the frequency and intensity of stretching, choosing the right exercises and executing them correctly, increasing strength with flexibility. Factors which cannot change the genetics, body structure, a serious injury or disability, age, and gender. Poor hamstring flexibility has often been associated with the low back and lower extremities.

In this study concludes, after the intervention, the hamstring flexibility was markedly increased for both groups. But comparatively group B shows better changes in the hamstring flexibility.

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