

Effectiveness of Myofascial Release Versus Passive Stretching on Hamstring Flexibility in Amateur Football Players - A Comparative Study

Dr. Ketaki Nitin Sakhalkar¹, Dr. Jaywant Nagulkar², Dr. Pradnya Mahajan³

¹MPTH, Dr. Ulhas Patil College of Physiotherapy, MUHS, India

²Principal and HOD of Musculoskeletal Department, Dr. Ulhas Patil College of Physiotherapy, MUHS, India

³Assistant Professor of Musculoskeletal Department, Dr. Ulhas Patil College of Physiotherapy, MUHS, India

Corresponding Author: Dr. Ketaki Nitin Sakhalkar

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ABSTRACT

Aim: To compare the effect of Myofascial Release and passive stretching on hamstring flexibility in amateur football players.

Background: Hamstring muscle plays an important role in the performance of daily activities such as controlled movement of trunk, walking, running and jumping and it is an important muscle involved in maintaining balance and posture. The tightness of hamstring muscle is one of the main problems hindering performance in daily and sports activity. Hamstring injury recurrence is lower at highest professional players than the amateur players.

Procedure: This comparative study was conducted on 30 Amateur football players of age group 18-30 fitting in inclusion criteria. They were divided into two group by simple random sampling using odd even method of allocation. Group A received Myofascial Release session for 5-10 minutes for 6 session/ 1 week. And Group B received Passive stretching session holding for 60 secs for 6 sessions/1 week. Active Knee Extension angle was measured pre and post intervention. Data was analyzed using paired t test and unpaired t test using instat software.

Results: The result showed that both Myofascial Release ($p < 0.0001$) & passive stretching ($p < 0.0001$) is effective on improving hamstring flexibility but on intergroup comparison myofascial release was more effective than passive stretching in amateur football players ($p < 0.0001$)

Conclusion: The study concluded that Myofascial Release was more effective over Passive Stretching technique for improving hamstring flexibility among amateur football players

Keywords: [Amateur football players, Hamstring tightness, Myofascial Release, Passive Stretching.]

INTRODUCTION

In human anatomy hamstring comprises of 3 muscles Semitendinosus, Semimembranosus, Biceps femoris (long and short head) The three muscles cross the hip and knee joint and are involve in knee flexion and hip extension. The short head of biceps femoris crosses only one joint (knee) and hence is involved only in knee flexion⁽¹⁾.

Hamstring muscle plays an important role in the performance of daily activities such as controlled movement of trunk, walking,

running and jumping and it is an important muscle involved in maintaining balance and posture⁽²⁾. Flexibility dysfunction is a widespread problem faced by common as well as sportsperson, especially in hamstring group of muscles^(3,4). Hamstring tightness is not only a causative factor for reduced range of motion but it can also lead to various musculoskeletal problems⁽⁵⁾. Flexibility is an important component of injury prevention and rehabilitation⁽⁴⁾. The tightness of hamstring muscle is one of the

main problem hindering performance in daily and sports activity⁽⁷⁾.

Hamstring injuries are common in sprinting, dancing, hockey and football players^(5,6). These injuries are often recurrent and result in considerable costs such as missed training time, unavailability for competition and treatment. Amongst football players at amateur level 50% of population have lower extremity injuries and 20% of population have hamstring injury. Most of the hamstring injuries are caused due to reduced hamstring flexibility. Thus flexibility of hamstring is important for general and physical health. Hamstring injury recurrence is lower at highest professional players than the amateur players⁽⁷⁾.

Myofascial release is a curative tool for treatment of tightness. It is the collection of techniques use for the purpose of relieving soft issues from an abnormal hold of tight fascia. Direct bodily effects range from alleviation of pain, improvement of athletic performance, and greater flexibility and ease of movement to more subjective concern such as better posture^(8,9).

The study was conducted by Keisuke Itotani, Kanta Kawahata et.al Myofascial Release of the Hamstrings Improves Physical Performance Myofascial Release (MFR) was applied to the hamstrings to evaluate its effects. MFR on the hamstrings was performed on 17 young adults were physical performance were measured before, immediately after, and 5 days after the MFR intervention which shows that MFR for hamstrings not only improves flexibility but also increases physical performance⁽⁸⁾.

Muscle stiffness of lower extremities and subsequent decrease of flexibility are generally considered etiological factors in musculoskeletal injuries. to prevent muscle injuries, stretching exercises before sports activity are usually recommended. Reasons for stretching relates to beliefs that stretching exercises will increase flexibility and decrease muscle stiffness.

The intended purposes of stretching are 1) to ensure that the individual has sufficient

range of motion. 2) To decrease muscle stiffness or increase muscle compliance thereby theoretically decreasing injury risk. With respect to performance stretching improves performance and decreases injury risk.

The purpose of this study is to see whether Myofascial release technique is effective or Passive stretching in order to improve hamstring flexibility in amateur football players.

MATERIALS & METHODS

MATERIALS

- Pen
- Paper
- Goniometer
- Informed consent form.

METHODOLOGY

- Sample size- 30
- Study Design – Experimental Study
- Study Type- Comparative Study
- Sampling Method – Simple Random sampling method
- Study population – Amateur football players
- Study setting – In and around football clubs in Jalgaon, Maharashtra
- Treatment duration- 6 session for 1 week.

SELECTION CRITERIA:

Inclusion criteria

1. Age between 18-30 years
2. Male football players
3. Amateur football players
4. Players with hamstring tightness more than 20 degree of Active Knee Extension angle.⁽¹³⁾
5. Players who are willing to participate.

Exclusion criteria

1. Skin Infection
2. Recent Fractures
3. Patients with previous lumbar, hip and knee surgery
4. Patients with hamstring injury in past 2 years

5. Patients with lumbar and lower limb unstable neurological conditions
6. Acute severe low back pain

PROCEDURE

To conduct the following study permission was taken from the principal of Dr. Ulhas Patil college of physiotherapy, Jalgaon. Ethical clearance was obtained from institutional ethical committee. Subjects were screened as per the inclusion and exclusion criteria and the procedure was explained. A written consent was obtained from the subjects. Initially the demographic

data that is Name, age, gender, height, weight were assessed. Popliteal angle was measured to check for hamstring flexibility. Popliteal angle was measured for only right leg. Subjects with popliteal angle more than 30 degree were considered. In this study 30 subjects were divided into two groups, group A(n=15): Myofascial release group and group B (n=15): Passive stretching group by simple randomization method. There were no dropouts from the study. Popliteal angle was measured before and after.



Protocol:

Group A:

Myofascial Release Technique

Patient position: Prone lying

Therapist position: beside patient

Procedure: Myofascial Release technique is given by using ulnar border of hand MFR was given from proximal to distal direction using a light amount of pressure over

hamstring muscle. The pressure was being scaled following contact until the slack in the skin was taken up and that position was held until the tissues begins to soften the position of hand will be crossed in order to work as energy efficiently as possible. The stretch was maintained for 60 seconds. Treatment time will be 5-10 minutes 6 sessions for 1 week the intervention for each subject and score was noted ⁽⁸⁾.



Group B:

Passive Stretching

Patient position : Supine lying

Therapist position: beside patient.

Procedure: Subjects in the passive stretching group had their knee extended by one examiner while lying supine with 90° of hip flexion. In the same position, subjects in

the active stretching group extended their own knee. Stretches were performed times in 3 sets of the assigned stretch. Each stretch was held for 10 seconds at the point where tightness in the hamstring muscles was felt, and then the leg was slowly lowered (over 10 seconds)⁽¹¹⁾



DATA ANALYSIS

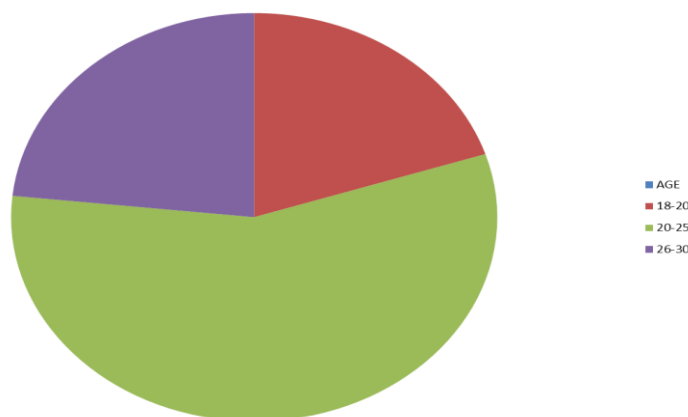
Improvement in the range of motion was analyzed using Active knee extension test. Data was entered in excel spreadsheet, tabulated and subjected to statistical analysis. Data was analyzed by using Graph pad Instat, checking effectiveness of Myofascial Release versus Passive

stretching on hamstrings flexibility in Amateur football players.

Table 1. Age distribution

AGE	PARTICIPANTS
18-20	6
20-25	17
25-30	7

AGE DISTRIBUTION



STATISTICAL ANALYSIS

Data analysis was done for Group A and Group B using outcome measures Active knee extension test. The data passed normality test. Pre and post analysis for ranges by using Myofascial Release

Technique for Group A was done by paired t test. Pre and post analysis for ranges by using Passive stretching technique for Group B was done by paired t test. Group A and Group B data was analysed using unpaired t test.

Table 2. Comparison of pre and post Active knee extension test values in MFR group test.

Myofascial release	Right		Left	
	Pre	post	Pre	Post
	Mean+Std Deviation	42.5±5.36	26.4± 5.42	40.2± 4.20
P Value	<0.001		<0.001	
T Value	2.738		2.546	

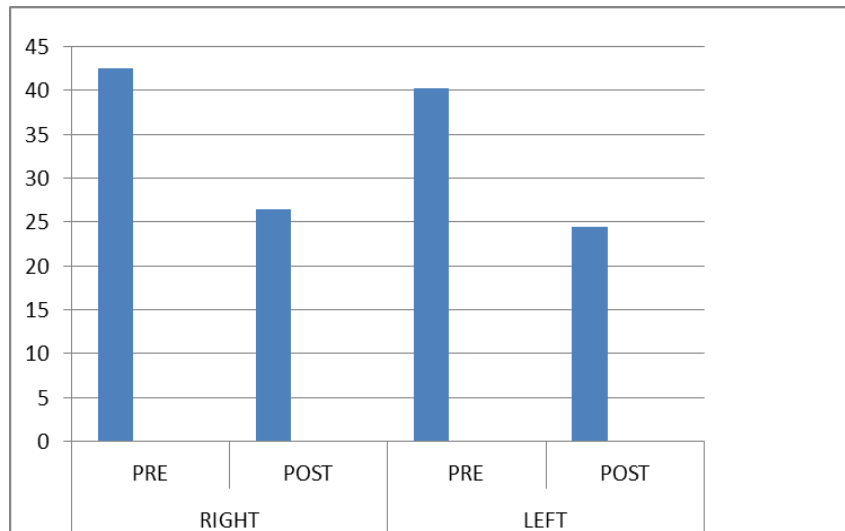


Table 3. Comparison of pre and post Active Knee Extension Test values in Passive stretching group

Passive Stretching	Right		Left	
	Pre	Post	Pre	Post
	Mean + Std. Deviation	43.5± 4.43	33.6± 4.46	41.8± 4.12
P Value	<0.001		<0.001	
T Value	9.05		8.33	

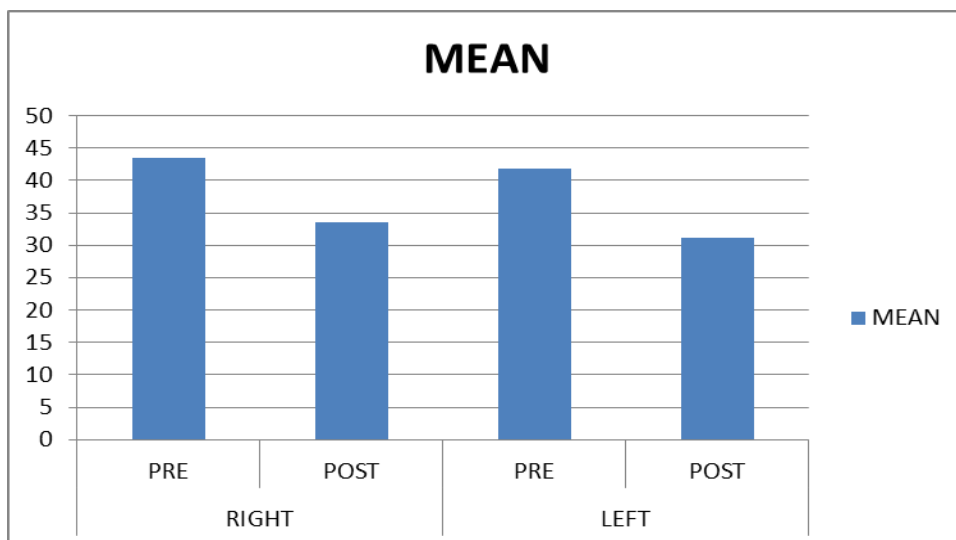
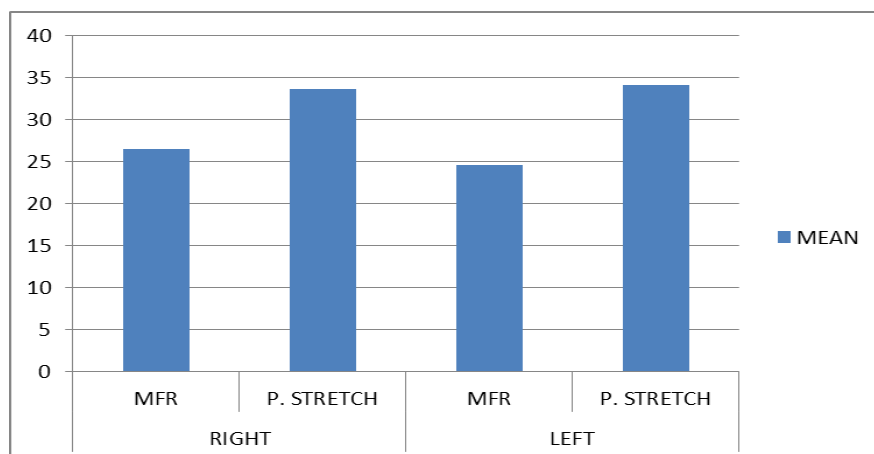


Table 4: Comparison between Group A (Myofascial Release Technique) and Group B (Passive stretching).

INTERGROUP COMPARISON				
MEAN+STD. DEVIATION	RIGHT		LEFT	
	MFR	P. STRETCH	MFR	P. STRETCH
	26.4± 5.43	33.6±4.2	24.5±5.23	34.12±4.7
P VALUE	0.0001		0.0001	
T VALUE	10.43		10.32	



RESULT

Present study was conducted to compare the effect of Myofascial Release technique versus passive stretching on hamstring tightness. Statistical analysis was done using InStat software. Inter group analysis was done using paired t-test within the groups and unpaired t-test for comparison between the groups. The values $p=0.001$ and $t=2.738$ was found pre and post MFR on right limb, $p=0.001$ and $t=2.546$ on left limb using paired t-test within the group, considered. The value $p=0.0001$ and $t=29.28$ was found pre and post passive stretching on right limb, $p=0.0001$ and $t=8.833$ on left limb using paired t-test within the group, considered extremely significant. The value $p=0.001$ and $t=9.05$ was found pre and post passive stretching on right limb, $p=0.001$ and $t=8.33$ on left limb using paired t-test within the group, considered extremely significant. The values when compared between the groups were $p=0.0001$ and $t=10.43$ in post MFR v/s passive stretching on right limb and $p=0.0001$ and $t=10.32$ was in left limb respectively using unpaired t-test, hence considered extremely significant.

DISCUSSION

Flexibility is the most important component in any conditioning program. Flexibility has been defined as the ability of a muscle to elongate and allow one or more joints in a kinetic chain to move through a range of motion. The lack of flexibility of the hamstring muscle group has a higher risk of non-contact muscle injury, and for several

other conditions, such as changes in lumbopelvic rhythm, thoracic kyphosis and lumbar flexion, and lower back pain.⁽¹²⁾ In this study we have compared Myofascial release technique and Passive stretching to improve hamstring muscle flexibility in Amateur football players.

The result of this study showed significant decrease in Active Knee Extension Test (AKET) angle after treatment in comparison with before treatment. And there was statistically significant difference between both the groups. There was more improvement in group A (MFR) compared to group B (Passive stretching).

Keisuke Itotani et. Al conducted the study on Myofascial Release of the Hamstrings Improves Physical Performance found that MFR for hamstrings affects not only the improvement in flexibility but also the improvement in physical performance. Therefore, it is important to perform MFR to maintain physical function and performance until the restriction of activity is lifted and people are able to actively increase the amount of physical activity.

According to our study result we hypothesized that Myofascial Release apparently may affects the elastocollagenous complex (integrated collagen and elastin fibers), as well as the consistency of the ground substance. Increased soft-tissue flexibility relieves tissue tension within the elastocollagenous complex. While the density and viscosity of the matrix (ground substance) decreases, the metabolic rate increases, resulting in

improved metabolism and health. If the fascia has shortened and tightened and twisted, it can contribute to and perpetuate musculoskeletal dysfunction⁽¹⁷⁾.

However the result of this study showed that reduction of 10-20 degree in AKE angle was seen after application of MFR, while a decrease of 5-10 degree in AKE angle after Passive stretching was noted as probably myofascial release causes golgi-tendon organ to sense a change of tension in the muscle and responds to this prolonged tension by inducing relaxation of muscle spindles.

Winter et al. reported that passive stretching is characterized by the external addition of stretch stimulation on muscle contraction, while active stretching is characterized by a reciprocal innervation mechanism used to relax antagonist muscle contraction. In the previous study conducted by Yuichi Nishikawa et. Al on Immediate effect of passive and active stretching on hamstrings flexibility stated that the final knee extension position was held for 10 seconds by subjects while holding the stretch position the excitatory spinal motor neurons overcome γ inhibitory neuron impulses. Passive stretching improves flexibility for patients with contracture and limited flexibility.

CONCLUSION

On the basis of analysed data, it was concluded that Myofascial Release Technique had better effect than Passive Stretching in improving hamstring flexibility in Amateur football players.

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Conflict of Interest: None

Source of Funding: None

Ethical Approval: Approved

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