

Efficacy of Met Over Passive Stretching in Order To Increase the Flexibility of Hamstring Muscles.

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Abstract

Background

Hamstring's tightness is the inability of the muscles through its full range of amplitude and is associated with hypomobility refers to decrease mobility or restricted motion a wide range of pathological process can restrict movement and ampere mobility. It can also lead to final limitation and disability in normal life. Hamstring's tightness is the inability to stretch the muscles through its full range of amplitude and is associated with several condition of the knee and the spine.

Aim

To measure the efficacy the MET over Passive stretching in order to increase the flexibility of hamstring muscles.

Methodology

For this study, 80 patients were selected. It was divided into two groups of 40 participants of each group in between 18-25 years. The patient was unable to actively extend beyond 160 degree in supine lying. Four bouts of stretching was applied over the first group, in a session. Each bout was applied for a period of 30 sec with rest of 60 sec in each bout. MET is applied over the other Second group.

Result:

MET was more effective in increasing flexibility of the hamstring muscle compared to passive stretch.

Discussion:

The review of existing literature regarding the role of different technique for increasing hamstring flexibility reveals a confusing picture, so the current study was undertaken to compare the techniques, Passive Stretching against MET to determine which is better in long run, for the purpose of this comparison a pre and post test follow up was carried out. Hamstring was the muscle of choice because according to Turner, and et al 1988 Hamstrings are the muscles groups that have tendency to shorten. A tight hamstring causes increased patella-femoral compressive force which may eventually lead to patella-femoral syndrome also there are well documented, reliable and valid methods of testing flexibility of the hamstrings such as Active Knee extension test

Keywords: Hamstring, MET, Degree, Session, Muscles, Tightness

Introduction

The hamstring control the pelvis by pulling down on the ischial tuberosity creating a posterior tilt on the pelvis and are responsible for maintaining upright posture. Hamstring muscles, most common injured muscles during activities. Hamstring's strains are most common recurrent injuries experienced by a person. Flexibility is the most important factor to increase the skill of person and avoid muscle

injury and tendon injury. Stretching involves elongation and extensibility of muscles and tendon by moving parts of body generally to end of available range of motion. While on other aspect, MET is effective in patient who have severe pain, tightness from acute somatic dysfunction, such as those with a whiplash injury, or a patient with sever muscle spasm from a fall. The full Range of Motion of a joint is based on length-tension relationship of a muscle which gets altered if the length of a muscle changes giving rise to contracture, tightness or weakness.²⁴

Methodology:

Study design: Randomized controlled study.

Sampling method: Simple random sampling

Sample size: Total 80

- Group A: 21 subjects received Ice with Passive stretching treatment

- Group B: 21 subjects received MET treatment

Study setting: SAM Global University Clinic, Raisen

Study duration: 3 months

Inclusion Criteria:

- Subjects having reduced hamstring flexibility, unable to actively extend knee beyond 160 degrees in supine lying.
- Only Male are subjected.

Exclusion Criteria:

- Patient with Chronic Low back Pain
 - Patient with Acute/Chronic hamstring's injuries
 - Patient with previous injuries of Hip and Knee joint.
 - Patient with Limb Length Discrepancy
 - Patient with Visual acute swelling
- Material used: Plinth, Stabilising belt, Universal goniometer, Stop watch

Outcome measure: For measuring the hamstring flexibility, the active knee extension test was used in both the groups.

Procedure:

Study Place: The research study was conducted at SAM Global University in Raisen, Madhya Pradesh, India.

Ethical approval : Ethical approval for the study was obtained from the Institutional Ethical Committee. This indicates that the study was conducted following ethical guidelines and principles to ensure the well-being and rights of the participants.

Informed Consent: Informed consent was obtained from all the participants involved in the study. This means that participants were provided with clear and understandable information about the study, its purpose, potential risks, and benefits, and they voluntarily agreed to participate.

Number of Participants: A total of 80 patients were assessed for the study. These participants were individuals who met the criteria for inclusion in the study.

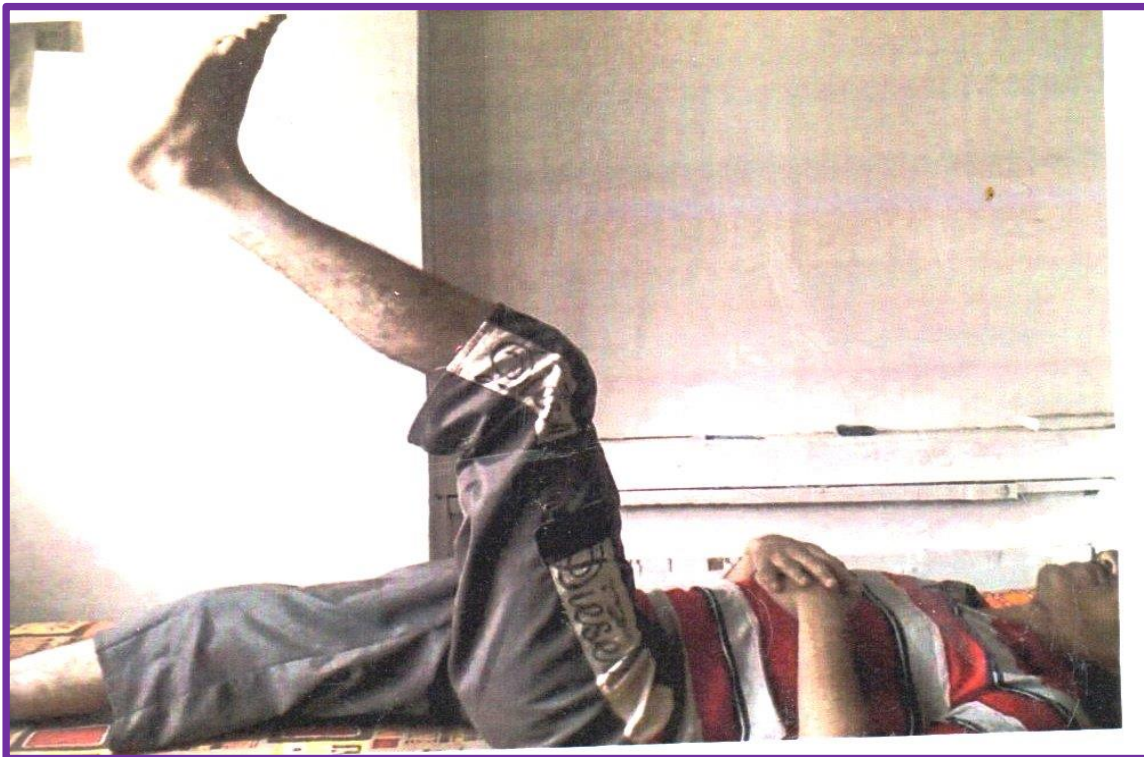
Inclusion and Exclusion Criteria: Inclusion and exclusion criteria are used to determine which

individuals are eligible to participate in the study and which should be excluded. These criteria help ensure that the study's results are valid and relevant to the research question.

Group A – Passive stretching For Hamstrings tightness: The patient was in supine lying with a small pillow below the contralateral knee. The patient was asked to maintain the hip in 90 degrees of flexion, with the help of both hands. The ankle joint was in a relaxed position. The patient's foot was placed on therapist's shoulder and the hamstring muscles were maximally stretched from this position. The stretch was maintained for a period of 30 seconds, 30 sec rest and the procedure was repeated for a total of three times.

Group B- Received MET treatment. The pre and the immediate post reading of AKET were measured

- The contralateral leg may be either flexed or may lie straight on the plinth.
- The affected leg was flexed at both the hip and knee joints, and then slowly straightened by the therapist until the restriction barrier was identified
- The limb was moved a little away from the restriction barrier and the isometric contraction against resistance was introduced.
- The patients were asked to resist the movement with no more than 30% of strength. The contraction was held for 8-10 seconds followed by complete relaxation of the limb.
- On exhalation, the knee joint was straightened (extended) towards its new barrier and through that barrier a stretch was applied and maintained for 25seconds. • 3 repetitions of this process were done10.



Result

Table: 1a showing Age distribution of Group A

Age group	Total
18	10
19	7
20	3
21	5
22	6
23	6
24	1
25	2

Group A Age distribution of Group

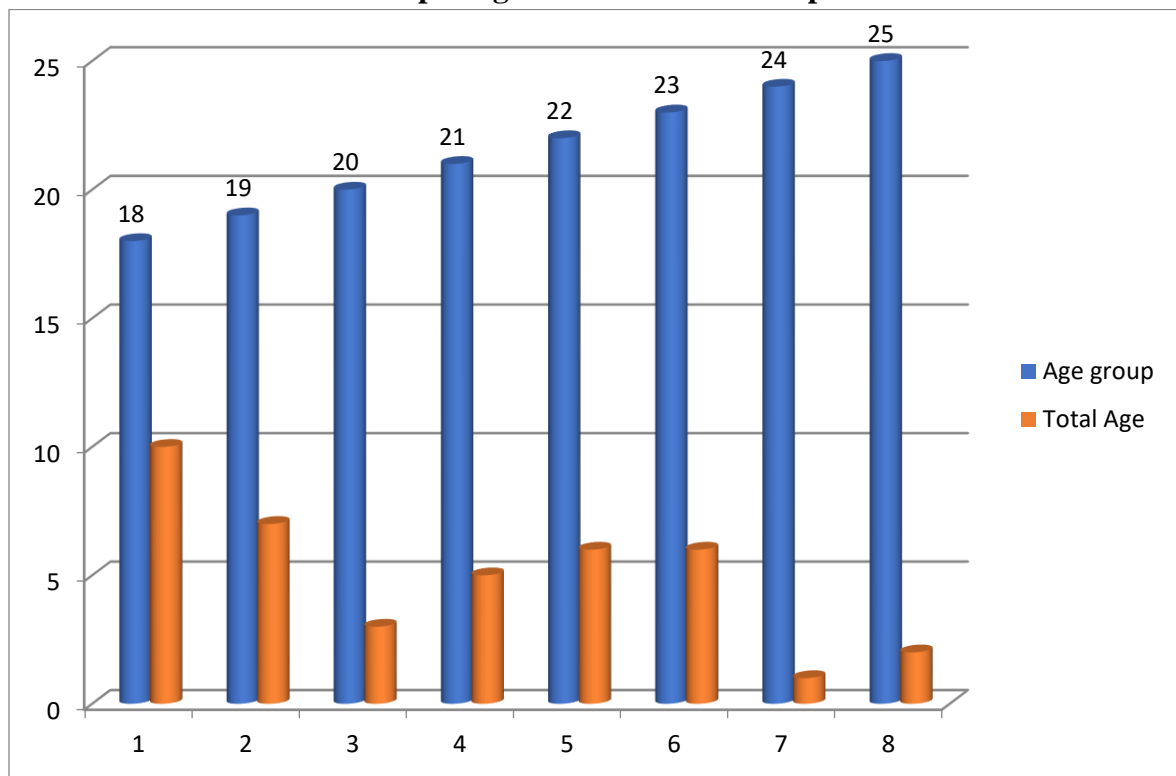


Table: 1b showing Age distribution of Group B

Age group	Total
18	10
19	6
20	2
21	3
22	6
23	3

24	6
25	4

Group B Age distribution of Group

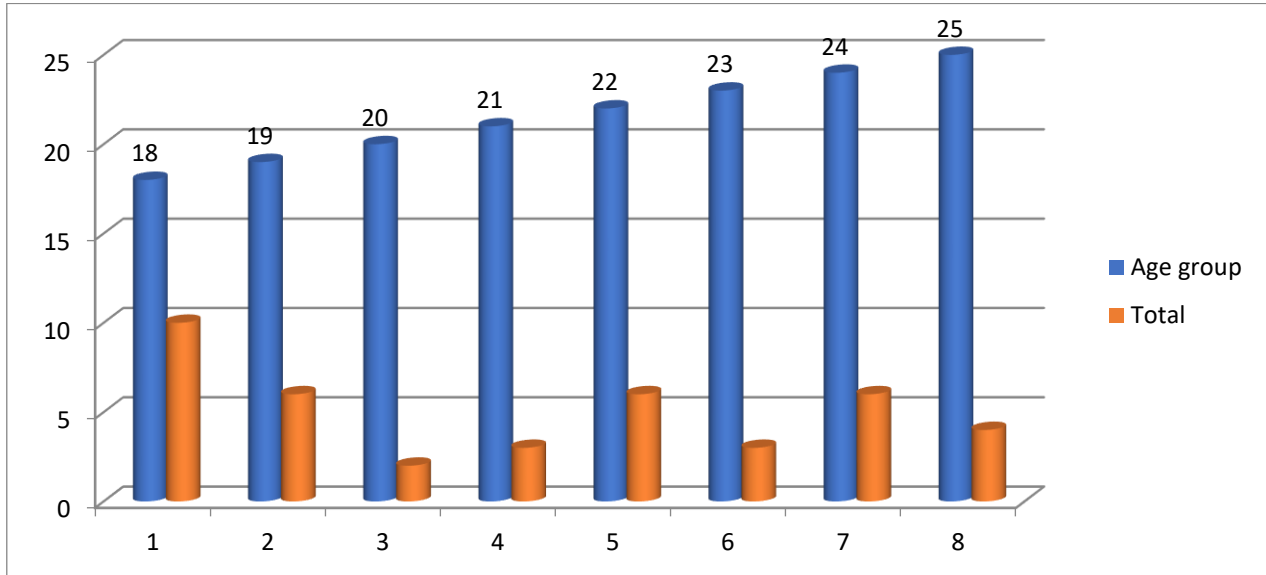


Table-2 Mean and SD of Active Hip Extension test in Group A and Group B

	Group A		Group B	
	Mean	SD	Mean	SD
Pre	150.44	3.400	150.77	3.190
Post	155.1	3.559	156.65	3.611

In Group A average reading of Active Knee Extension test was 150.44 with SD 3.400 and after treatment it increased to 155.1 with SD 3.559

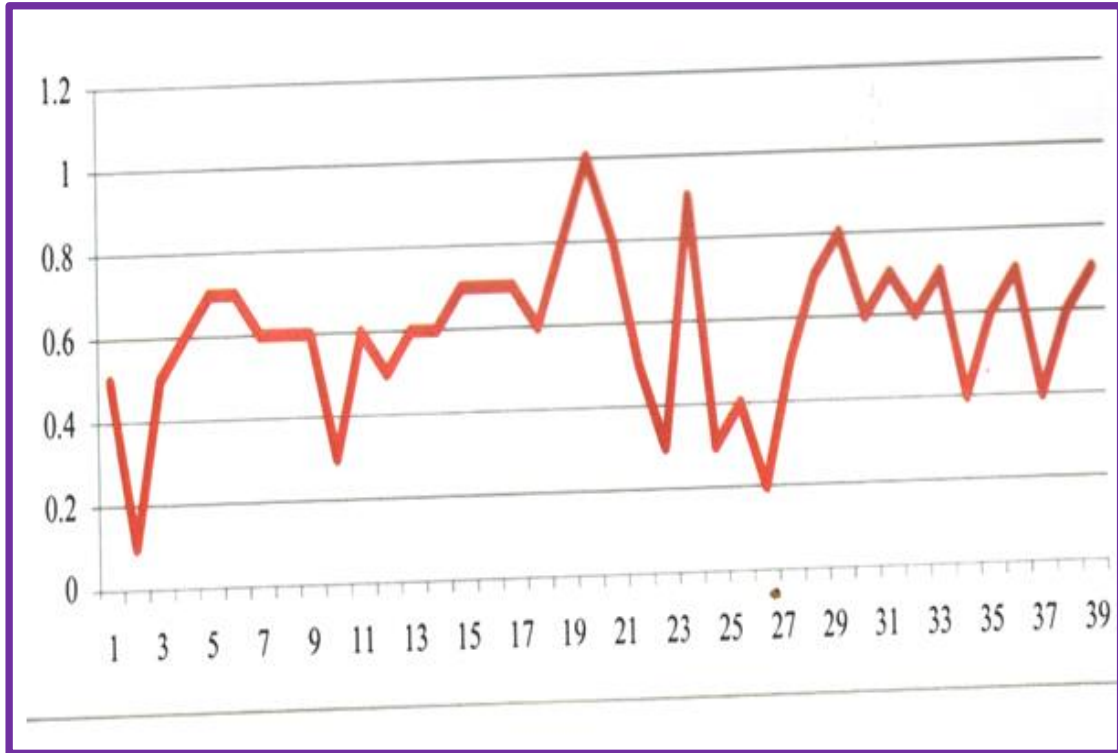
In Group B average reading of Active Knee Extension test was 150.707 with SD 3.190 and after treatment it increased to 156.65 with SD 3.611

Table-3 Table showing t-value, p-value for Group A and B

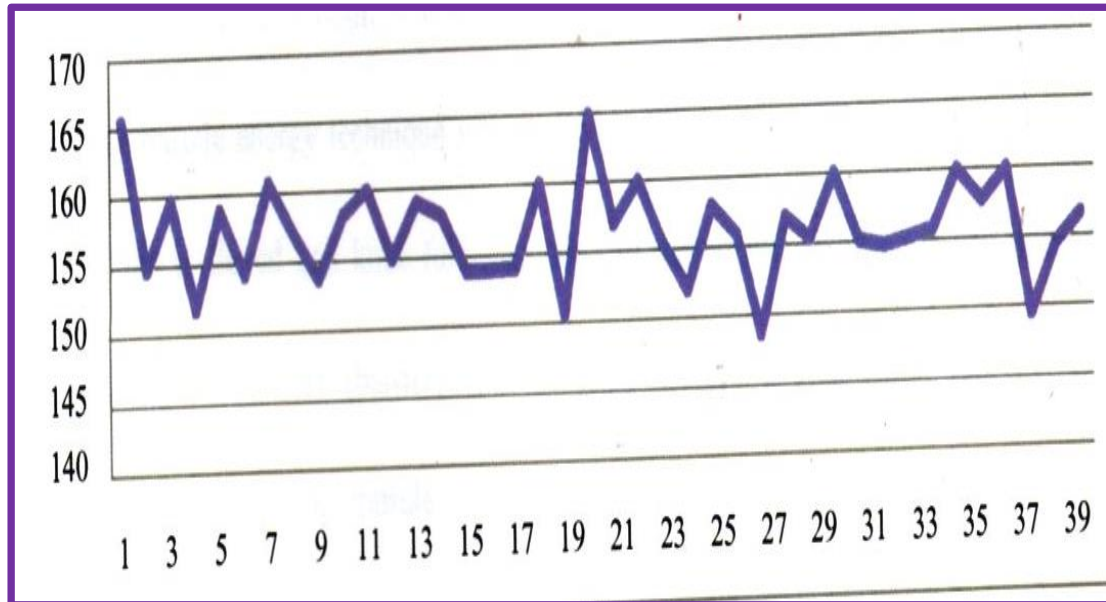
Active Knee Extension Test	t-value	p-value	Result
Group-A	4.308	0.000	p<0.05
Group-B	4.571	0.000	p<0.05

Here p<0.05 means in Group A and Group B there is improvement in Active knee using test after the treatment, but Group B which was treated with MET showed significant improvement compared to Group A

Table: c showing Post and Pre treatment difference in Group A subjects (Passive Stretch)



Graph: d Showing Post and Pre treatment difference in Group B subjects (MET)



Discussion:

A tight hamstring causes increased patella-femoral compressive force which may eventually lead to patella-femoral syndrome also there are well documented, reliable and valid methods of testing flexibility of the hamstrings such as Active Knee extension test. The study carried out on effectiveness of ice and stretching in Group A had mean difference Of 5.34, 1 value 4.308 (p value 0.00) proved to be effective in lengthening shorten hamstring. Gary R. Brodowicz et al conducted similar study in which moist heat, ice and stretching was used. The result of the investigation suggest that application of ice

while stretching hamstring may provide enhanced short-term improvement in flexibility over heat or stretching alone.

Group B had a mean difference of 5.88, 1 value of 4.571 (p value 0.00) $p > 0.005$ Wasim et al conducted a study which showed that MET was more effective for increasing hamstring flexibility. Hence result of MET for increasing hamstring flexibility was found to be more effective in increasing hamstring flexibility compared to ice with stretching

The changes in ROM observed in the present study appear to be consistent with a viscoelastic tissue response within the elastic range where the stretched tissue does not immediately return to its original length (Lederman 2005; Magee et al., 2007).

Ballantyne et al., (2003) suggest that if increases in ROM following MET were due to changes in viscoelastic properties alone, allowing greater muscle extensibility, this would be achieved using a constant torque or force of stretch.

MET stimulates the muscle spindle and Golgi tendon organs reducing excessive activity, Stretching of the muscle fibers stimulates the Golgi tendon receptors which have an inhibitory influence on muscle tension, leading to muscle relaxation, when a muscle is actively contracted, its antagonists are reflexively relaxed.

CONCLUSION

Passive stretch was compared with MET to increase the flexibility of hamstrings both techniques showed good result. Based on the results from the current study it was found that MET was more effective in increasing flexibility of the hamstring muscle compared to passive stretch. Hence alternate hypothesis is accepted.

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