



“A COMPARATIVE STUDY OF THE FOAM ROLLER VERSUS MYOFASCIAL RELEASE TECHNIQUE ON HAMSTRING FLEXIBILITY IN COLLEGE GOING STUDENTS USING SIT AND REACH TEST.”

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Abstract: **BACKGROUND:** The characteristic of a hamstring muscle to get tightened is much higher than other skeletal muscles. Physical inactive way of life causes bad body posture. That would be the reason so far that the long sitting hours seen in college students to get altered length of hamstring muscles. Cross hand release methods are by a far the main, major and normally utilized strategies in the MFR approach and structure the premise of each other MFR procedure. Instrument are right now being made and tried to be utilized to recreate myofascial release procedures so people can do their own helped fascial discharge at home without the guide of an advisor. One such device is foam roller. **METHODOLOGY:** According to inclusion criteria 40 subjects from Ahmedabad Physiotherapy College were selected. With the help of simple chit method of randomization all 40 subjects were divided into two different groups. Group A foam rolling, and Group B cross hands myofascial release technique. **RESULT:** Result were statistically analyzed using paired and unpaired t-test by using SPSS version 20, there was significant improvement in SIT AND REACH SCORE with $p < 0.05$ in group A and group B, but there was more significant improvement in SIT AND REACH SCORE in group B rather than group A. **CONCLUSION:** For improvement in hamstring flexibility in college going students cross hands MFR was more effective treatment then foam rolling. On individual bases both treatments were improving sit and reach test score in college going students.

KEY WORDS: foam roller, cross hands myofascial release technique, hamstring flexibility, college students, sit and reach test.

INTRODUCTION

The characteristic of a hamstring muscle to get tightened is much higher than other skeletal muscles.¹ Hamstring muscles are place at the posterior side of the thigh between gluteal region & popliteal fossa. The group of hamstring muscles consist of 4 muscles - semitendinosus, semimembranosus, long head of biceps femoris, and the ischial head of adductor magnus.²

To get optimal physical activity, we need to prevent muscles to get stiff. For that, it is required to do regular stretching to maintain its normal length and prevent the muscles to get short & tight. Moreover, it benefited by reducing the risk of getting muscle knot and other musculoskeletal injuries.^{3,4} There would be various reasons for muscle shortening. One of the reasons is immobilization or prolonged consistent posture. Since, the body posture is maintained by slow muscle fibres, they have a capacity to maintain prolonged contraction. Hence, chances of them to get tight & short is higher than other muscle fibres which do not play major role in maintaining the body posture.⁵

Physical inactive way of life causes bad body posture. That would be the reason so far that the long sitting hours seen in college students to get altered length of hamstring muscles.¹ Thus, in this investigation college student was incorporated.

Muscle mass is separated from the neighbouring tissues by a thick fibrous tissue layer known as fascia.⁶ In our body every muscle, bone, vessels, nerves etc is covered by fascia, so indirectly fascia is responsible for muscle flexibility. In response to any trauma, fascia can act as a protective layer by restricting its flexibility. Because of this, it creates poor muscular biomechanics. Over the period of time, functional capacity of that muscle would be lost.⁷ Myofascial release was created by Mark F. Barnes in 1997 and is an involved soft tissue procedure that encourages the limited fascia. MFR has been one of the physiotherapy therapies given in the ongoing condition that causes tightness and limitation in soft tissues. By myofascial release there are adjustments in the consistency of the ground substance to a more liquid state which kills the fascia's extreme tension on the agony touchy structure and re-establishes proper alignment.⁸ Cross hand release methods are by a far the main, major and normally utilized strategies in the MFR approach and structure the premise of each other MFR procedure.⁹

A variety of myofascial release strategies is ordinarily performed physically by specialist. Instrument are right now being made and tried to be utilized to recreate myofascial release procedures so people can do their own helped fascial discharge at home without the guide of an advisor. One such device is foam roller.¹⁰ Golgi Tension unit is stimulated by pressure of foam rolling and helps in decrease muscle injury. It is estimating that foam moving deliveries fascial bonds and lessens scar tissues. Moreover, the foam roll diminishes recovery time and improves muscle execution.¹¹ Thus in this investigation foam roller is utilized as an apparatus to improve hamstring flexibility.

PURPOSE OF THE STUDY

- Muscle shortening due to prolonged consistent posture causes tension over hamstring fascia. Clinically it can lead to the permanent bad posture such as flat back as in dysfunction of the hip, SI, lumbar spine joints. If it is not corrected than it can lead to altered muscle biomechanics and makes it more vulnerable towards the injury.
- Available literature says that foam rolling is helpful tool to cure hamstring tightness.
- However, there is a vast room for research in cross hand myofascial release technique in improving hamstring flexibility.
- Considering above facts, I would like to document effectiveness of Foam roller and Myofascial release technique on improving hamstring flexibility.

AIM

- Aim of the study is to compare the effectiveness of the foam roller technique and myofascial release technique for improving hamstrings flexibility.

OBJECTIVE

- To check whether the foam roller can improve hamstring flexibility in college going students.
- To check whether the cross hands myofascial release technique can improve hamstring flexibility in college going students.

INCLUSION CRITERIA

- Ahmedabad Physiotherapy College's students
- Age 18 to 25
- Both gender
- Hamstring tightness (at hip in 90 degree if AKE lose around 20 to 50 degree)
- Those who wants to part of this study

EXCLUSION CRITERIA

- Acute or chronic hamstring injury
- Metal implants in lower extremity
- Recent fracture and stiffness in lower limb
- Soft tissue injuries around knee.

MATERIALS AND METHODS

- **Study Design:** An Experimental study
- **Study Subject:** Subject with hamstring tightness
- **Sample Size:** 40
- **Source of data:** Ahmedabad Physiotherapy College
- **Sampling Method:** Simple random sampling
- **Study Duration:** 3 times/week , for 4 weeks

OUTCOME MEASURE

- **SIT AND REACH TEST (SRT)**

SELECTION OF SUBJECTS INTO GROUPS:

According to inclusion criteria 40 subjects from Ahmedabad Physiotherapy College were selected, before starting treatments I give them brief introduction about my study and their consent was taken, both verbally and written. With the help of simple chit method of randomization all 40 subjects were divided into two different groups. So, subjects who get chit named A were allotted in group A and treated with foam roller, those who get chit named B were treated with cross hands myofascial release technique.

To confirm the effectiveness of both treatments SIT AND REACH TEST score was measure before and after 4 weeks.

All the precautions for COVID 19 were taken during this study.

PROCEDURE

GROUP A: FOAM ROLLING

- One introductory lecture was taken before the treatment session in which all the subjects was educate about what is foam roller and how to use it.
- Place the foam roller between their ischial tuberosity and floor with their legs extended, instructed them to keep their ankles relaxed.
- Subjects were then instructed to support their body weight with their arms extended but to allow as much pressure between the hamstring muscle group and the foam roller.
- Then actively move the foam roller at a cadence of 1second inferior (ischial tuberosity to popliteal fossa) and 1 second superior (popliteal fossa to ischial tuberosity) as determine with the metronome.
- To prevent fatigue allow subject to rest after every 1 min of repetitions for 30 seconds only.
- Total treatment duration is 5 min.¹²

GROUP B: MYOFASCIAL RELESE TECHNIQUE (CROSS HAND RELEASE)

- During treatment subject were wearing comfortable clothes.
- Subject's privacy was maintained during treatment time.
- **Position of subjects:-**lie prone with the legs straight.
- **Position of therapist:-**stand at the side of the treatment table.
- **Hand placement for cross hand MFR Technique:-** One hand was placed skin on skin, on the posterior thigh close to the back of the knee with fingers pointing towards the ankle or wrapping around the thigh
- Other hand was just below the ischial tuberosity, where the hamstring muscles attach, with fingers pointing towards the head.
- Then applied stretch to the fascia.

- Each stretch was maintained for 30 seconds.
- **Total treatment duration:** - 5 min on each limb.⁹

STATISTICAL ANALYSIS

- To check the improvements of this two treatments statistical analysis were done with statistically package of social sciences (SPSS 20 IBM).
- All the pre and post data was primarily analyzed.
- As this analysis shows that data of this study follows normal distribution parametric test was used that is t test.
- Statistically significant was set at $p < 0.05$
- Analysis was done within and between the groups by paired and unpaired t test.
- To overcome all conflict, the demographic data like: - height, weight, age, gender distribution also check and compared.

RESULT

Demographic profile:

In this study 40 subjects (minimum age was 18 and maximum age was 25) whose having hamstring tightness was included out of which 10 were male and 30 were female.

CLINICAL PARAMETERS

As the p value of this group is < 0.05 so it shows significant result in increasing hamstring flexibility.

| | Pre SRT | Post SRT | Different | t value | p value |
|----------------|-------------|-------------|------------|---------|----------|
| Group A | 11.32(4.14) | 15.85(5.78) | 4.52(2.30) | 2.09 | 0.02 |
| Group B | 11.3(2.32) | 19.25(2.19) | 7.95(2.05) | 3.36 | < 0.01 |

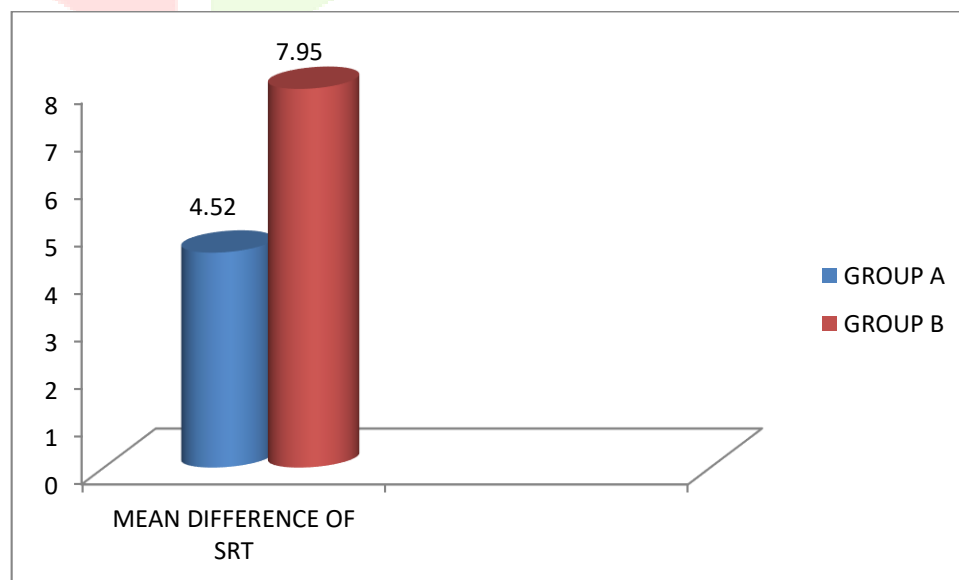
Table 1.2:- Within Group Comparison Sit and Reach Score for Group A and Group B as mean (SD)

COMPARISION OF BOTH GROUPS

For confirmation that which treatment is more important within group comparison was done by unpaired t test.

Unpaired t test was done on different values of both the groups.

This graph shows that there is more improvement in sit and reach test in Group B (cross hand myofascial release technique) rather than Group A (foam roller)



Graph 1.5:- Comparison of Group A and B Sit and Reach Test Differences

DISCUSSION

This study was established to check the effectiveness of foam roller and cross hands myofascial release technique, and compare both the treatment for improving hamstring flexibility for those who having tightness. For this study 40 subjects were taken from Ahmedabad physiotherapy college, Ahmedabad. Randomization was done by simple chit method into 2 different groups, Group A (foam roller) and Group B (cross hands MFR).

For Group A subjects one introductory session was arranged in which I teach them how to use high thickness foam roller. And standardized protocol of 4 weeks was set for this study which helps to confirm the chronic effect of this treatment. For evaluation of hamstring tightness SIT AND REACH TEST was used. Its score was documented before and after the study.

In this study out of 40 subjects only 10 were male this might be because of several reasons like I choose physiotherapy students and in this field number of female is higher. Even study was done by Hooman Minoonejad in that they check whether Q angle have any correlation with hamstring tightness, and their results shows that there was a significant difference in the value of Q angle with hamstring tightness. Female having wider pelvis, so they have higher Q angle.¹⁴ Female subjects having more significant tightness this was confirmed by Dipesh Thakur in his study.¹⁵

According to this study results both the group had improve their sit and reach score as both statistically shows p value > 0.05 so both the treatments were effective for improvement in hamstring flexibility. As per my knowledge this is first study which is going to treat hamstring tightness with cross hand myofascial release technique as other articles used different technique of myofascial release.

While doing comparison of this two treatments, subjects who were treated in Group B with cross hands MFR shows more improvement in hamstring flexibility then Group A. Reasons behind more improvement in Group B can be (1)Effectiveness of foam rolling is depends upon the participant's skill. So, this becomes very subjective. (2) While performing foam rolling subjects have to lift their whole body weight on to their hands and have to maintain equal pressure between foam roller and muscle for entire treatment session. As weight and upper limb strength is not equal for all the subjects. In Group A there was 2 drop outs, this might gave impact on statistical values.

CONCLUSION

For improvement in hamstring flexibility in college going students cross hands MFR was more effective treatment then foam rolling. On individual bases both treatments were improving sit and reach test score in college going students.

REFERENCES

- 1) Kisner, Carolyn Therapeutic exercise: foundations and techniques.
- 2) B. D. Chaurasia's Human anatomy regional and applied dissection & clinical volume 2, lower limb, abdomen and pelvis, 5th edition.
- 3) A. K. Nagarwal et al. Improvement of hamstring flexibility. A comparison between two PNF stretching techniques. International Journal of Sports Sciences and Engineering 2010, 4: 25-33.
- 4) Glen M De Pino et al. Duration of maintained hamstring flexibility after cessation of an acute static stretching protocol. Journal of athletic training 2000 35(1): 56-59.
- 5) P. B. Costa et al. Acute effect of static stretching on peak torque and the hamstrings to quadriceps conventional and functional ratios. Scand J. Med Sci. Sports 2013, 23 (1), 38-45.
- 6) K. Sembulingum Essentials of Medical Physiology 6th edition. 169.
- 7) Barnes MF: The basic sciences of myofascial release morphologic change in connective tissue.
- 8) Carol Manheim: The myofascial release manual. 3rd edition.
- 9) Ruth Duncan: Myofascial release hands on guides for therapists.
- 10) Kathleen M. Sullivan et al. "Roller massager application to the hamstrings increases sit and reach range of motion within five to ten seconds without performance impairments." IJSPT volume 8, number 3, June 2013.
- 11) Junker Daniel H. et al. "The foam roll as a tool to improve hamstring flexibility" The journal of strength and conditioning research December 2015, volume 29, issue 12, pages 3280-3485.
- 12) Andrew R. Mohr et al. "Effect of foam rolling and static stretching on passive hip flexion range of motion." Journal of sport rehabilitation .23(4), 296-299, 2014.

- 13) Hooman Minoonejad et al. "Comparison of Q angle and tibial torsion among premier league futsal players with and without hamstring tightness." Physical treatments April 2016, volume 6, number 1.
- 14) Dipesh Thakur et al. "A study to find out the correlation between the right and left hamstring length in both genders to determine the prevalence of hamstring tightness among college students." Nitte university journal of health science. Volume 6, no. 4, December 2016. ISSN 2249-7110.

