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Comparative effectiveness of Active Release Technique and Rolfing Soft Tissue Manipulation in Normal Subjects with Hamstring Tightness - A Randomised Clinical Trial

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ABSTRACT

Study Design: A randomized clinical trial.

Objective: To investigate the effects of Active release Technique and Rolfing Structural Integration on hamstring tightness.

Method: 40 subjects with age group of 18-25 years and having hamstring tightness diagnosed by criteria of limited extension range of less than 60 degrees determined by Active knee extension method were selected and were randomly assigned into 2 groups. Group A was given Active Release Technique. Group B was given Rolfing Structural Integration. Assessment taken pre and post intervention. The primary outcome measures were Popliteal angle and Sit and Reach test.

Result: The data analysis and statistical inference showed that both the interventions had successful results in reducing hamstring tightness in terms of reducing Popliteal angle and increasing the Sit And Reach Test. Active Release Technique showed greater improvements in terms of reduction in Popliteal angle as compared to Rolfing Structural Integration.

Conclusion: Active Release Technique and Rolfing Structural Integration are effective in reducing hamstring tightness in terms of Popliteal angle and Sit And Reach Test but Active Release Technique showed better improvement as compared to Rolfing in terms of Popliteal angle.

Keywords: *Rolfing, Active Release Technique, Hamstring Tightness*

INTRODUCTION

Regular physical activity has been regarded as an important component of a healthy lifestyle and has been proven to increase longevity and the overall quality of life. Flexibility and stretching comprise as the cornerstone of injury prevention and increased mobility for exercise enthusiasts.[1] Flexibility is defined as absolute range of movement in a joint or series of joints that is attainable in a momentary effort with the help of therapist or a piece of equipment.[2]

The hamstrings play a crucial role in many daily activities, such as, walking, twisting running, jumping, and controlling some movement in the trunk. They also play an important role in sports that require a powerful thrust such as sprinting and jumping.[3] Hamstrings are a postural muscle and as it is biarticular, it has tendency to shorten even under normal circumstances.[4] Prolonged sitting can hold the hamstrings in a contracted state, causing them to lose their flexibility. Hamstring tightness is a risk factor for hamstring strain and reduced performance.[5]

Active Release Techniques (ART) is a patented, non-invasive, soft tissue treatment process that both locates and breaks down the scar tissue and adhesions which cause pain, stiffness, weakness, numbness, and physical dysfunctions associated with Repetitive Strain Injuries. ART is used both for the treatment of RSI injuries, as well as for the improvement of athletic performance. ART aims to return complete translation or relative motion to the full length of the affected soft tissue and to its adjacent soft-tissue structures. This means complete freedom of motion for the entire restricted structure in relationship to all adjacent structures.

Most soft-tissue techniques address only a small aspect of the total restrictions that exist within soft-

tissues. The majority of soft-tissue techniques do not consider the complete kinetic chain in treating a soft-tissue restriction.[6]

Ida Rolf theorized that "bound up" fascia often restricts opposing muscles from functioning in concert with one another. Rolfing aims to separate bound up fascia by deeply separating the fibres manually to loosen them and allow effective movement patterns.[7] Rolfing, a brand of structural integration, offers a combination of bodywork and movement education. It manipulates the body's connective tissue to rebalance the body and bring pain relief from chronic pain, stress and injury. [8]

The most common interventions improving hamstring flexibility include MET, PRT, Pilates stretch, myofascial release etc. There are few studies proving the efficacy of Rolfing and Active release technique on muscle flexibility. There has been no study comparing the efficacy of these techniques on muscle flexibility. The purpose of this investigation was to determine if Rolfing soft tissue manipulation and Active release technique would significantly improve hamstring flexibility in an asymptomatic population.

METHODOLOGY

Institutional Ethical clearance was obtained for approval of the study.

- Participants: 40 participants were recruited from Kle University College of physiotherapy that volunteered to participate in the study. Informed consent was taken from all the participants prior to participation. The inclusion criteria included age group of 18-25 years and having hamstring tightness diagnosed by criteria of limited extension range of less than 60 degrees using Active knee extension method. The participants selected were randomly assigned into 2 groups. Exclusion criteria included any history of injury in past 3 months, hypermobility and neurological impairments.

Group A was given Active Release Technique. Group B was given Rolfing Structural Integration and assessment taken pre and post intervention.

Measurements: Outcome measures included Popliteal angle measurement and Sit and Reach test distance.

Intervention

Rolfing soft tissue manipulation aimed to separate bound up fascia by deeply separating the fibres manually to loosen them and allow efficient movement patterns. The fascia manipulated until it can operate in conjunction to the muscles in a normal fashion. Usually one session lasts for 45-60 minutes. (Image 1)

Fig. 1. Rolfing Soft Tissue Manipulation

Active Release technique developed by Dr. Michael Leahy. Widely used in rehabilitative and sports medicine for myofascial pain syndromes. Participants were positioned supine while investigator palpated the hamstring muscle. Three passes of ART therapy were applied to the hamstrings. An ART treatment pass involves taking the tissue from a shortened position to a lengthened position while maintaining manual contact. (Image 2)

Fig. 2. Active Release Technique

Statistical Analysis

- Paired t test was used for within group comparisons and between group comparisons, p value set at less than 0.001.

Table 1. Comparison Between Groups in Terms of Sard

Group	Pre-intervention Mean (Cms)	Post-intervention Mean (Cms)	Difference (Cms)
Art	11.65±8.35	22.55±4.01	10.9±5.39
Rolfing	13.52±5.86	22.10±3.24	08.58±4.01
T Value	0.808	0.380	1.428
P Value	0.424	0.706	0.162

Table 2. Comparison Between Groups In Terms Of Popliteal Angle (Right)

Group	Pre-intervention (degrees)	Post-intervention (degrees)	Difference (degrees)
Art	33.4±9.49	6.05±4.04	27.35±5.89
Rolfing	29.47±6.45	8.47±4.47	21±5.47
T Value	1.503	1.776	3.480
P Value	0.141	0.084	0.001

Table 3. Comparison Between Groups In Terms Of Popliteal Angle (Left)

Group	Pre (Degrees)	Post (degrees)	Difference (degrees)
Art	32.60±10.30	5.65±5.25	26.95±5.64
Rolfing	30.73±8.05	9.42±6.07	21.31±4.28
T Value	0.627	2.076	3.498
P Value	0.535	0.45	0.001

RESULTS

The results showed significant improvement in pre and post test measurements in terms of both the outcome measures for both the groups.

For Sit and reach test, value of t for Active Release Technique was 9.029 and for Rolfing, t= 7.946, p<0.001. Table 1

For Popliteal angle within group comparison, right side,

Paired t=20.744, p<0.001 for ART

Paired t=16.712,p<0.001 for Rolfing. Table 2

For popliteal angle within group comparison, left side,

Paired t=21.359, p<0.001 for ART

Paired t=21.696, p<0.001 for Rolfing. Table 3

The results showed that Active release technique proved more effective in terms of reducing popliteal angle than Rolfing.

But the results were not significant in terms of Sit and Reach test in terms of between group comparisons.

DISCUSSION

This study proved the effectiveness of Active Release Technique as well as Rolfing soft tissue manipulation on hamstring tightness in terms of decreasing Popliteal angle and increasing Sit and Reach test distance. Active Release technique showed greater improvements in terms of reducing popliteal angle. Till date this study has been first of its kind comparing the effectiveness of these two techniques.

Rolf believed that health and well being at every level are a function of architectural integrity of the body, of the span and balance of myofascial system within gravity. Distortions and patterns of strain within fascial network can be expressions of injury, illness, stress.[13] Rolfing involves application of intelligent pressure with fingers, knuckles and elbows to soften and lengthen fascia.[14] Many professional athletes undergo Rolfing for relief of pain, soft tissue injuries, musculoskeletal problems and enhancement of performance. [15] A study by Deutsch J, Derr LL, 2000 stated that Rolfing is effective in treating chronic pain.[16]A study by James H, Castanda L, 2008 proved effectiveness of Rolfing in treating cervical spine dysfunction.[17] A study by Findley T, Quigley K, 2004 showed improvement in balance in subjects with myofascial pain treated with Rolfing.[18]

Outcomes of these studies suggest that Rolfing has positive effects on musculoskeletal pain and associated limitation in joint motion and on balance. Research on underlying therapeutic mechanism suggests improvement in movement co-ordination and efficiency. Research has shown Rolfing to be effective in cases of chronic fatigue syndrome by inducing relaxation and reducing anxiety.[19]

Active Release technique is designed to accomplish three unique objectives: restoring free and unimpeded motion of all soft tissues, release of entrapped nerves, vasculature, lymphatics and re-establish optimal texture, resilience and function of soft tissues.[20]

A study by James W. George, Jason Fennema, 2007 proved that Active release technique applied to suboccipital muscles improved cervical ranges and reduced cervical pain.[21] A study by Andrew Robb, 2010 proved the effectiveness of Active release technique in increasing the pain pressure threshold in individuals with adductor strains.[22] Another study by James

W.George proved the effectiveness of ART in reducing symptom severity and enhancing functional status in individuals with carpal tunnel syndrome.[2] Therapeutic mechanism stated is lengthening of the muscle and hence improved flexibility and efficient movement.

CONCLUSION

Active Release Technique and Rolfing Structural Integration are effective in reducing hamstring tightness in terms of Popliteal angle and Sit And Reach Test but Active Release Technique showed better improvement as compared to Rolfing in terms of Popliteal angle.

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