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RESEARCH ARTICLE

EFFECT OF MYOFASCIAL RELEASE AND STRETCHING EXERCISES ON PLANTAR FASCIITIS- A RANDOMIZED, COMPARATIVE STUDY

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ABSTRACT

Objective: To Compare the effects of MFR and stretching exercises on pain and flexibility in plantar fasciitis. **Method:** The study is a randomized control trial carried out at Uttaranchal College of Technology and Biomedical Sciences, Dehradun. Total 30 patients between the age group 20 to 50 years both males and females having been randomly allocated to Group A and B. Group A received Myofascial release therapy and Group B received Static stretching technique for 4 weeks. **Results:** There was a statistically significant difference of pre-post reading within the two groups. Group A which was treated with myofascial release technique (MFR) when results were viewed on visual analogue scale and Foot Function Index showed significant improvement in the plantar fascia symptoms in comparison to Group B who received stretching exercises, while analysis of mean and standard deviation values within the groups, Group A showed significant decrease in VAS as compared to Group B. **Conclusion:** Both myofascial release and stretching exercises are effective in treating patients with plantar fasciitis; however the present study concludes by saying that MFR is better than stretching in 4 weeks intervention

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INTRODUCTION

Plantar fasciitis (PF) is classified as a syndrome that results from repeated trauma to the plantar fascia at its origin on the calcaneus (Mark, 1999). It is a common foot disorder affecting millions of individuals across the world (Neena, 2010). It occurs over a wide-range and is seen in athletes and individuals who lead a sedentary lifestyle. The precise cause is unclear, but the most common theory is repetitive partial tearing and chronic inflammation of the plantar fascia at its insertion on the medial tubercle of calcaneus (Anders Henricson, 1983; Benedict, 2003). The plantar fascia is a thick fibrous sheet of connective tissue that originates from the medial tubercle of the calcaneous and attaches distally to the metatarsophalangeal joints, forming the medial longitudinal arch. It stabilizes the medial longitudinal arch dynamically, it restores the arch and aids in reconfiguring the foot for efficient toe-off and it provides static support of the longitudinal arch and dynamic shock absorption (Craig *et al*., 2001).

Degeneration of the plantar fascia at its calcaneal origin is termed plantar fasciitis (2010). Studiesreport that faulty biomechanics is a major cause of Plantar Fasciitis. Subjectshaving either a lower or higher arched foot can experience plantar fasciitis. Patients with lower arches have too much motion, whereas patients with higher arches have too little motion both leading to the pathology of PF (Lori *et al*., 2004).The treatment can be further divided into numerous categories as extra-corporeal shock wave therapy, conservative care (chiropractic therapy, electric modalities, patient education, soft tissue therapy message, acupuncture, taping, night splints, stretching, ice, heat strengthening and orthotics), injections and medication. Ultrasound is one of the most commonly indicated therapeutic modality and has shown good results with regard to pain reduction and improved function (Julia Maria, 2009). Myofascial release (MFR) is a system of therapy that combines principles and practice from soft tissue technique, MET and inherent force cranio-sacral technique.

It includes a highly subjective transfer of energy from the therapist to the patient (Travell and Simons, ?). MFR is defined by Upledgeret. al. that it is a softening or letting go when resistance melts and the tissue elongates. MFR techniques can deep superficial or deep pressure at the point of restriction or low-load prolonged gentle distraction of restricted tissues. Stretching exercises are also thought to be an important element of fitness and conditioning programs designed to promote wellness and reduce the risk of injury and re-injury. When soft tissue is stretched, elastic, visco-elastic, or plastic changes occur.

MATERIALS AND METHODS

Design: Experimental study design.

Population and Sampling: Total 30 sample size: 15 subjects in each group (Group A& Group B)

Selection Criteria

Inclusion criteria

- Both male and female
- Age: 20 to 50 years
- Subjects having pain more than 3 months over the heel.
- Pain with first steps on walking.

Exclusion Criteria

- Subjects who were undergoing corticosteroid injection
- Fracture around ankle and Calcaneal
- On NSAID for last 3 weeks
- Any soft tissue injuries around ankle
- Other Neurological/ Musculoskeletal disorder
- Congenital foot anomalies

Instruments and tools

- Foot Function Index (FFI)
- Visual Analogue Scale (VAS)

Procedure

Group A: Myofascial Release Technique: Subjects received MFR therapy for the plantar fascia. 10 second MFR technique applied by knuckle on the sole. The intervention was followed for 2 times/ week for 4 weeks.

Group B: Static stretching technique: Subjects received Static stretching exercises of the plantar fascia, they were asked to hold the stretch for 30 seconds with 5 repetitions. This intervention was followed for 3 sets for 30 seconds/ session i.e.4 sessions for 4 weeks. The study was carried out in outpatient Department of Physiotherapy, Uttaranchal College of Technology and Biomedical Sciences, on previously diagnosed cases of plantar fasciitis by the orthopaedic surgeon Moreover, consent forms were given which is signed by their parents and subjects were randomly allocated into 2 groups. Group A and Group B. Each of the subject in both the groups were examined before and after intervention on Foot Function Index and VAS

Position of the subject was prone lying with the feet off the end of the table to allow maximum dorsiflexion. Therapist position was sitting on a stool at the end of the table. Using the knuckles, soft fist or elbow engage the soft tissue just anterior of the calcaneus, take up a line of tension in an anterior direction. Work progressively through to the ball of the foot as well as into deeper layers in the subsequent passes. Instruct the subject to lift their toes, with direction- Lengthen the bottom of your foot by taking your toes up under the table towards your knee cap. Dorsiflexion can also be used in conjunction to this.
For PF stretching exercises subjects were told to sit with affected leg cross over the opposite leg, they were asked to pull the toes back towards the shin until they felt a stretch in the arch of the foot.

Data Analysis: Statistics were performed using SPSS software 20.0. Level of significance selected for the study was $p<0.05$. Differences in scores of all outcomes measures, obtained by subtracting pre-treatment scores from the post treatment scores, were analysed with repeated measures of analysis of variance followed by Turkey Post Hoc Test.

RESULTS

There was a statistical significant difference of pre-post reading within the two groups. Group A which was treated with myofascial release technique when results were viewed on visual analogue scale and Foot Function Index showed significant improvement in the plantar fascia symptoms in comparison to Group B who's subjects were given stretching exercises, while analysis of mean and standard deviation values with in the groups, Group A showed significant decrease in VAS as compared to Group B

Table 1. Comparison of the mean values of Age between Group A and Group B

Demographic	Group A		Group B	
	Mean	SD	Mean	SD
Age	24.00	3.11	26.06	5.7

Table 2. Mean and Standard Deviation of Pre VAS and Post VAS for Group A and Group B

Session	Group A		Group B	
	Mean	SD	Mean	SD
Pre VAS	5.2	1.03	5.8	1.42
Post VAS	2.3	0.72	3.89	1.01

Table 3. Comparison of the mean values of Pre VAS and Post VAS between Group A and Group B

Session	Group A		Group B	
	t- value	P value	t- value	P value
Pre- VAS Vs. Post- VAS	12.85	0.00	10.24	0.00

Table 4. Mean and Standard Deviation of Pre FFI and Post FFI for Group A and Group B

FFI	Group A		Group B	
	Mean	SD	Mean	SD
Pre	39.6	8.50	40.77	13.96
Post FFI	19.63	6.24	26.47	7.3

Table 5. Comparison of the mean values of Pre FFI and Post FFI within Group A and Group B

FFI	Group A		Group B	
	t- value	P value	t- value	P value
Pre- FFI Vs. Post- FFI	12.10	0.00	4.95	0.00

DISCUSSION

The results of the present study showed that both Group A and Group B were effective in the treatment of Plantar fasciitis but after comparing the two groups Group A showed better results than Group B. Kuhar *et al* showed significant results by stating that the MFR is an effective therapeutic option in the treatment of plantar fasciitis which also supports the findings of the present study (Suman Kuhar, 2007). MFR stimulates fibroblasts proliferation, which lead to collagen synthesis that may promote healing of plantar fascia by replacing degenerative tissue with a stronger and more functional tissue (Joahua Dubin, 2007). MFR are claimed to cause vasomotor response, increase blood flow to the affected areas, increase lymphatic drainage of the toxic metabolites, considering that myofascial release is thought to hydrate dehydrated ground substance of the injured tissue and restore functional ROM to the areas of painful restriction, perhaps optimal ROM effects can only be expected in pathological tissue (William, 1994). On the other hand stretching regardless of how it is performed causes a lengthening of the muscle, even if methods utilising contraction- relaxation or reciprocal inhibition appears to yield better results (Anders Henricson, 1983). Stretching relaxes the neuromuscular system in general. The major goal of stretching is to recreate the windlass mechanism and to minimise repetitive microtrauma associated with chronic inflammation, by doing the exercises prior to the first step in the morning or after prolonged sitting or inactivity. This protocol provides a conservative treatment option that resulted in a rate of improvement of symptoms (Benedict, 2003)

Limitations

- Small sample size
- No follow up was done in the present study

Future scope

- Follow up can be done for the study.
- Larger population can be undertaken for the study
- Study can be undertaken where work exposure is a causative agent of the pathology.

Conclusion

Both myofascial release and stretching exercises are effective in treating patients with plantar fasciitis, however the present study concludes by saying that MFR is better than stretching in 4 weeks intervention

Ethical approval: Ethical approval was taken from the Department of Physiotherapy, Uttaranchal College of Technology and Biomedical Sciences, Dehradun, India.

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Conflict of interest: There is no conflict of interest of any sort.

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