



RESEARCH ARTICLE

LONG TERM EFFECT OF MYOFASCIAL RELEASE TECHNIQUE VERSUS POSITIONAL RELEASE TECHNIQUE ON PAIN AND FUNCTIONAL ABILITY IN SUBJECTS WITH CHRONIC PLANTAR FASCIITIS

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ABSTRACT

Introduction: Plantar fasciitis is one of the most common causes of inferior heel pain which can be aggravated by biomechanical stress. Pain, decreased ankle mobility and weight bearing during walking can affect the individual's functional performance. **Objective:** The aim of this study was to compare the long term effect of Myofascial Release Technique and Positional Release Technique on pain and functional ability in subjects with chronic plantar fasciitis. **Materials and Methods:** 40 subjects with chronic plantar fasciitis within an age group of 40 to 60 years were randomly assigned to two groups of 20 each. Group A was given Myofascial Release Technique and Group B was given Positional Release Technique. The intervention was given for 10 consecutive days. All the subjects were assessed using Visual Analogue Scale and Foot Function Index to measure pain and functional ability respectively prior to intervention, post-intervention at 10 days (post-test-1) and at the end of 1 month (post-test 2). **Results:** It was observed that subjects in both the groups were homogenous prior to the intervention. When within group comparison was done, it was seen that both the groups improved after intervention during post-test 1 and post-test 2 ($p < 0.001$). But when both the groups were compared, it was seen that there was a statistical difference in pain ($p < 0.001$) immediately after the intervention, but no difference was seen in the Foot Function Index ($p > 0.05$). But at 1 month follow-up, it was seen that there was a significant difference in between the groups in both the outcomes ($p < 0.001$). **Conclusion:** Myofascial release technique and Positional release technique were found to be individually effective in reducing pain and improving functional ability in subjects with chronic plantar fasciitis. But when both the groups were compared, the long term effect of Myofascial release technique was better than the Positional release technique.

INTRODUCTION

Plantar fasciitis is one of the most common causes of inferior heel pain. Plantar fascia helps in maintaining the medial longitudinal arch of the foot and facilitates shock absorption while weight bearing and helps in walking (Bartold, 2004). Biomechanical abnormalities in the foot like tight Achilles tendon, pes cavus and pes planus can lead to plantar fasciitis (Gill, 1997). When the Achilles tendon is tight, ankle dorsiflexion is reduced leading to increased pronation of foot which in turn increases tensile loads on the plantar fascia causing repetitive micro trauma and tears disturbing the normal healing process that can result in chronic inflammatory reaction (Puttaswamaiah, 2007). Many physiotherapy treatment protocols such as rest, taping, orthotic supports, night splints, silicon heel cups and stretching are in use along with electrotherapy modalities in the form of ultrasound, phonophoresis, LASER, microwave diathermy, iontophoresis, cryotherapy and contrast bath to treat plantar fasciitis (Kage, 2010; Kumar, 2019). Myofascial Release Technique (MFR) is a soft tissue manipulation technique that is based on the idea that fascia reorganizes

itself along the lines of tension in response to physical stress and its thickness (Yadav, 2012). Myofascial release reduces the viscosity decreasing the pressure on the pain sensitive structures of the fascia and restores proper alignment.^[7] Hence, this technique was proposed to act as a catalyst in the resolution of the chronic plantar fasciitis (Kumar, 2019). Positional Release Technique (PRT) is an indirect myofascial technique focusing on the neuro-vascular myofascial somatic dysfunction. It places the muscle in a shortened position to promote muscle relaxation and muscle flexibility. MFR and PRT were used in the past to reduce pain and to improve functional ability of the subjects with chronic plantar fasciitis (Pattanshetty, 2015). Literature review suggests that both the techniques are equally beneficial in plantar fasciitis (Kage, 2014) but there is a dearth of literature on the long-term effect of these two techniques. Most of the previous studies concentrated on the immediate effect of MFR and PRT but the long term follow up was not studied to see the retention effect of these techniques. Hence, this study aimed to compare the long-term effect of Myofascial Release Technique and Positional Release Technique in subjects with chronic plantar fasciitis.

METHODS AND MATERIALS

40 male and female subjects between the age group of 40 to 60 years diagnosed with chronic plantar fasciitis where the subject would have had pain for more than 3 months (Rutherford, 2001) were recruited for

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the study from a tertiary care centre in Bangalore. Subjects with any infections in the foot, calcaneal spur, calcaneal fracture, flat foot, metal implant and foot deformities, history of any systemic diseases, major trauma or surgery in and around the ankle joint and foot, sciatica or any other neurological disorders, skin diseases or impaired circulation in the lower extremities, subjects who were administered corticosteroid injections in the heel in the last 3 months were excluded from participating in the study. Subjects who fulfill the inclusion and exclusion criteria were selected for the study and randomly assigned to one of the two groups, 20 in each group. Informed written consent was taken from all the subjects. Permission from the Institutional Ethical Committee was obtained. Demographic variables such as age and gender were documented. Subjects in Group A received Myofascial Release Technique. In this, the subjects were asked to lie down in supine position with the therapist at the foot end of the couch. The therapist used a closed fist to contact the sole of the subject's foot just proximal to the metatarsal heads. While applying pressure to the plantar aspect of the foot, the therapist positioned the foot into dorsiflexion & toe extension. Then, the therapist dragged his/her fist over the plantar fascia contacting the restricted layer and applied pressure in the length of the fascia maintaining the same pressure throughout and then it was released. This position was held for 90seconds (Yadav, 2012).

Subjects in Group B were given Positional Release Technique by applying brief mechanical pressure on the tender point after palpating the area with one fingertip in order to determine tenderness. The foot was then positioned in plantar flexion and gently fine-tuned by rotation, until the score in the tender point reduced to at least 70%. This position was held for 90 seconds following which pressure was slowly released and returned to neutral position (Kage, 2010). Intervention in both the groups was carried out once a day for 10 consecutive days. In addition to above interventions, all the subjects performed self-stretching to gastrocnemius, soleus and plantar fascia as a home exercise program which was monitored by the subjects in a diary. Stretching was performed for three repetitions and the stretch was held for a count of 30 seconds. All the subjects were asked to continue self-stretching after the intervention period. Advice was given on appropriate footwear and their day to day activities. All the subjects were assessed for pain and functional ability using Visual Analogue Scale (VAS) and Foot Function Index (FFI) prior to the intervention (pretest), post-intervention at 10 days (post-test 1) and after 1 month (post-test 2). VAS and FFI are widely studied for their reliability and validity to assess the intensity of pain and functional ability respectively (Boonstra, 2008; Budiman-Mak, 1991; Agel, 2005).

RESULTS

Table 1. Distribution of subjects with chronic plantar fasciitis according to age and gender over the groups

Characteristics	Group A	Group B
Age in years	45.55±5.78	48.75±7.25
Male / Female	8(40%) / 12(60%)	7(35%) / 13(65%)

Table 2. Range, mean and SD of outcome measures of subjects with chronic plantar fasciitis in Group-A

S. No.	Outcome measures	Group-A			
		VAS		FFI	
		Range	Mean±SD	Range	Mean±SD
1	Pre test	3-9	6.30±2.20	28.26-75.21	53.10±17.41
2	Post-test 1	1-7	3.65±1.72	7.26-14.34	10.22±1.56
3	Post-test 2 (After 1month)	0-3	1.25±0.85	5.67-10.53	8.33±1.39
Friedman test(NP ANOVA for dependent outcomes)		Chi-square value=30.51, df=2, p<0.001		Chi-square value=39.07, df=2, p<0.001	

DISCUSSION

This study aimed to compare the long term effect of Myofascial Release Technique and Positional Release Technique on pain and functional ability in individuals with chronic plantar fasciitis. Assessment prior to the intervention revealed that the participants were homogenous in both the groups (p>0.05). In Group A, it was observed that both pain and functional ability improved with MFR after the intervention and at 1 month post-intervention (p<0.001). This is in line with the research conducted by Renu B. Pattanshetty et al., where the authors observed that MFR helped in decreasing pain and improvement was seen on the Foot Function Index.^[8]MFR helps in normalizing the connective tissue by softening, lengthening and realigning the fascia.

Reduced ankle movement and great toe dorsiflexion are often observed in these subjects due to pain and tight achilles. Restricted ankle movement can also be due to myotatic reflex arc hyperactivity which is the result of excessive gamma gain. MFR helps in releasing fascial tension and restoring its tissue, thereby improving the circulation and reduces excessive pressure of the fascia on pain sensitive structures and restores proper alignment.

MFR lead to normalization in apoptotic rate, changes in cell morphology and fibroblast reorientation. MFR could have halted the degenerative process of the plantar fascia by initiating the healing process and improving the fascial architecture, returning the fascia to its normal length and collagen reorganization, thereby reducing pain [Ajimsha, 2014]. In Group B, the subjects received Positional release technique and the VAS score and the foot function index were seen to improve post-intervention and the results were maintained even after 1 month.

The results are supported by previous literature which stated that Positional release technique alters afferent neurons and affect somatic joint dysfunction. Excessive gamma gain leads to hyperactivity of the myotatic reflex arc as discussed earlier and restricts the movement and positioning the muscle in a relaxed position decreases the gamma gain and thereby increasing the ankle range of motion (Ajimsha, 2014).

Literature suggests that pain relief could be the result of reduction in the intrafusal and extrafusal fiber disparity and improved proprioceptive activity [Pinakin, 2012]. When post-test scores were compared in between the groups, MFR showed better improvement than PRT. It was observed that there was a significant difference in the VAS score after the intervention and it was maintained even after one month (p<0.001) but when the functional ability was assessed, it was seen that there was no significant difference in the FFI scores immediately after the treatment during post-test 1 (p>0.05) but it seemed to improve at 1 month follow-up during post-test 2 (p<0.001).MFR helps in releasing fascia and restoring its tissue. Fibroblast proliferation and collagen synthesis promote healing of plantar fasciitis helping pain reduction. MFR can be an effective therapeutic option in the treatment of plantar fasciitis and can have long lasting effect.

Table 3. Range, mean and SD of outcome measures of subjects with chronic plantar fasciitis in Group-B

S. No.	Outcome measures	Group-B			
		VAS		FFI	
		Range	Mean ±SD	Range	Mean ±SD
1	Pre test	2-9	6.10±1.74	18.26-98.26	49.32±17.98
2	Post-test 1	3-8	5.15±1.29	5.26-15.29	10.54±2.42
3	Post-test 2 (After 1 month)	4-7	5.15±1.13	7.28-21.27	12.31±3.70
Friedman test(NP ANOVA for dependent outcomes)		Chi-square value=20.48, df=2, p<0.001		Chi-square value=36.06, df=2, p<0.001	

Table 4. Range, mean and SD of outcome measures of subjects with chronic plantar fasciitis in between the groups

S. No.	Outcome measures	VAS			FFI		
		Group-A Mean ±SD	Group-B Mean ±SD	Test value	Group-A Mean ±SD	Group-B Mean ±SD	Test value
1	Pre-test	6.30±2.20	6.10±1.74	z=0.192, p>0.05	53.10±17.41	49.32±17.98	z=0.528, p>0.05
2	Post-test 1	3.65±1.72	5.15±1.29	z=2.603, p<0.001	10.22±1.56	10.54±2.42	z=0.625, p>0.05
3	Post-test2 (After 1month)	1.25±0.85	5.15±1.13	z=5.421, p<0.001	8.33±1.39	12.31±3.70	z=4.063, p<0.001

Note: p<0.05-significant, p>0.05-not significant.Z-Mann-Whitney U test

The main limitation of the study was that the BMI and profession of the subjects were not considered which could have affected the results of the study. Subjects were continuing their work duties throughout the study duration and the number of standing hours could have affected the results. Future studies can consider the standing duration of the participants and see the effect of the intervention in those subjects.

CONCLUSION

The current study provides evidence that both MFR and PRT help in reducing pain and improving functional ability in subjects with chronic plantar fasciitis. But when both these interventions are compared, the long term effect of the intervention was better with MFR than with PRT in improving pain and foot function in these subjects.

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GLOSSARY OF ABBREVIATIONS

FFI – Foot Function Index
MFR – Myofascial Release Technique
PRT – Positional Release Technique
VAS – Visual Analog Scale

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