Original Article

Physiotherapy and Occupational Therapy Journal
Volume 17 Number 1, January - March 2024
DOI: http://dx.doi.org/10.21088/potj.0974.5777.17124.2

Effectiveness of Ultrasound and Kinesio-taping Techniques versus Laser in Pain Relief in Plantar Fasciitis Patients along with Passive Stretching Exercises

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How to cite this article:
Mohammed Aslam. Effectiveness of Ultrasound and Kinesio-taping Techniques versus Laser in Pain Relief in Plantar Fasciitis Patients along with Passive Stretching Exercises. Physio Ther Occup Ther J 2024;17(1): 09-14.

ABSTRACT

Background: Plantar fasciitis is one of the most common musculoskeletal disorders of foot. The pain and discomfort associated with this condition has a dramatic impact on physical mobility and function. Treatment of this condition is usually conservative; however, review of literature revealed no clinical studies demonstrating the efficacy of any targeted treatment for this condition.

Methods: The subjects were examined according to the evaluation Performa. If they were found to be eligible for study. An informed consent form was taken. The subjects were assigned in to three different groups. In all three groups pre treatment session included assessment of pain, according to VAS before the application of any treatment. This was a comparative study which included 45 subjects with plantar fasciitis, who were randomly divided into three groups. Subjects in group I had 15 patients received ultrasound, passive stretching exercises and kineso taping while subjects in group II had 15 patients received laser, passive stretching exercises, while subjects in Group III had 15 patients received passive stretching only. Patients were evaluated at the 1st day, 5th day and on 10th day using VAS (visual analogue scale) for pain intensity.

Results: A statistically significant difference in improvement was noted within the groups and between the groups in terms of visual analogue (p0.05).

Conclusion: The results of this study suggest that Ultrasound and passive stretching, when clubbed with Kinesio Taping method, do have significantly better effect on pain relief in plantar fasciitis especially from day one itself, when compared with other two groups. Pain reduced in all three groups but methods used in group one much more effective in reducing pain in plantar fasciitis patients.

Key words: Plantar fasciitis; Kinesio tape; Ultrasonography; Passive stretching; Laser.

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Recieved on 21.01.2024 **Accepted on**: 14.03.2024

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INTRODUCTION

Plantar fascia is a dense, fibrous connective tissue structure originating from the medial tuberosity of the calcaneus. The plantar fascia extends distally and attach to the MTP joints and base of the toes.[1,6,7] The fascia covers the intrinsic musculature and neurovascular anatomy of the plantar foot. The Plantar heel pain associated with

plantar fasciitis is a common syndrome affecting approximately 15% of the general population. Plantar fasciitis is an inflammation of the plantar fascia localized most often at the attachment to the medial tubercle of calcaneus although it may extend distally along the fascia into the medial longitudinal arch.[8,10,9] The plantar fasciitis has been noted in the lowest level of running and in high mileage groups. Plantar fasciitis has also been frequently noted in dancers, tennis players, and Basket ball players.[12,18] Planter fasciitis also occurs in non-athletes in roughly the same percentage as athletes. Occupations requiring prolonged weight bearing have been associated with subcalcaneal pain.[6,10] Plantar fasciitis has been said to predominate in males, but this may be more of a function of occupation (e.g. laborers) and recreational activity (e.g. long distance running).[7,5] The pain is usually unilateral; bi-laterality should alert the clinician to an inflammatory arthritis or gout. Bilateral heel pain in patients with plantar fasciitis has been reported in 4% to 30%.[14,15,10] In furey's series of 103 patients without systemic disease, there was only a 55% male predominance. Two other large series also show about equal sex distribution.[4,8] Plantar fasciitis has been reported in patients from 7 to 85 years old. The majority of patients are over 40 years old, and the occurrence may be related to atrophy of the fat pad. Plantar fasciitis may present as a single entity or as a final common pathway due to other disorders.[10] These other disorders may be due to overuse, biomechanical derangement of the foot, nerve entrapment, inflammatory arthritis, or even stress fractures. Numbers of studies have been done to evaluate the efficacy of various physical therapy modalities in plantar fasciitis. However common consequences could not be reached regarding the efficacy of Ultrasound v/s Laser, indicating the superiority of one modality over the other.

Procedure

Sample: A convenient sample of 30 subjects were taken in this study.

Inclusion Criteria

1. Subject diagnosed with plantar fasciitis by the orthopedic surgeons.
2. Age 20-50 yrs.
3. Sex - both males and females
4. Unilateral or bilateral involvement of the heel

Exclusion Criteria

1. History of Any heel surgery
2. Non Co-operative patients
3. History of trauma to heel
4. Any malignancy, infection or inflammatory disease affection the heel
5. Use of Glucocoticosteroids
6. Any circulatory problems
7. Subjects who are having neurological problem
8. Persons under medication
9. Arthritic patient

METHOD OF SELECTION

The subjects were assigned into three groups randomly.

Group A- 10 subjects

Group B- 10 subjects

Group C- 10 subjects

Design

Group A	Group B	Group C
Experimental Group A	Experimental Group B	Control Group C
Ultrasound Laser	Stretching only	+ +
	Stretching Only	
Stretching		
Stretching & Kinesio Taping	Stretching	
Base line data	Base line data	Base line data
V10	V10	V10
Treatment given	Treatment given	Treatment given
10 days	10 days	10 days
Measurement taken	Measurement taken	Measurement taken
V1, V5, V10	V1, V5, V10	V1, V5, V10

V1 = VAS Reading immediately after treatment at day 0.

V5 = VAS Reading immediately after treatment at day 5.

V10 = VAS Reading immediately after treatment at day 10. Two weeks program was selected,

constituting 5 applications, per week.

Protocol

Estimated time needed for treatment:

Group A

Group A is given the ultrasonic rays for 6 minutes and stretching 5 days a week. Kinesio Taping is done every day once in 24 hours for 5 days a week. (for two weeks).

Group B

Group B is given the laser treatment for 3-4 minutes at frequency 400 mw and stretching 5 days a week. (for two weeks)

Group C

Group C is given only stretching, 5 days a week (for two weeks).

All the groups A, B and C were given therapy for 10 sessions.

Procedure

The subjects were examined according to the evaluation Performa. It they were found to be eligible for study. An informed consent form was taken. The subjects were assigned in to three different groups. In all three groups pre treatment session included assessment of pain, according to VAS before the application of any treatment.

Dosages:

Ultrasound

Intensity : 1.2 w/cm2
Mode : Pulsed.
Frequency : 1 MHZ
Site : at site of Location pain
Position : comfortable in supine lying with lower leg supported on cushion.
Duration : 5-6 minutes



Fig. 1: Ultrasound given to Patient

2 LASER

Mode : Continuous
Intensity : 1-2 Joules / session
Site : at the site of localized pain
Distance : Direct contact
Duration : 4 Minutes

All three groups undergo two week treatment session with each session having 5 applications per week. In these, pain measured on VAS scale were taken on 0 day pre treatment and 1st day post treatment and 5th day post treatment and 10th day post treatment.

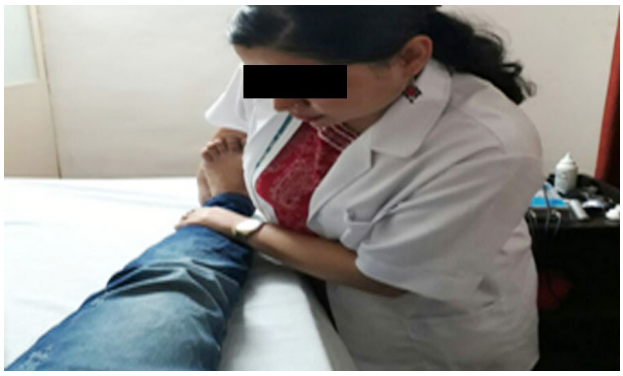


Fig. 2: Stretching given to Patient

Data Analysis

The data analysis was done using Microsoft excel 2003 of Microsoft Office 2003. In the experimental design the values for dependent variables pain measurement were collected. Measurement were taken on 0th, 1st, 5th, 10th days of treatment (see master chart, appendix). Mean and SD for the pain on all Vo, V1, V5, V10 calculated.

RESULT

Study was designed in such a way that each groups involved "10" subject each.

Prior to treatment age and VAS score were not matched between groups.

Mean ± SD of VAS Score compare between the groups as shown in table 5.1.

Mean ± SD of VAS occurred prior to the treatment for group A is 5.4 ± 1.14 for group B is 5.6 ±0.547 and for group C is 5.0 ±0.70.

Mean ±SD of VAS occurred on first day treatment for group A is 5.2 ± 0.83 for group B is 5.6 ±0.54 and for group C is 5.0 ±0.70.

Mean ±SD of VAS occurred on 5th day after

treatment for group A is 3.4 ± 0.54, for group B is 4.4 ±0.54 and group C is 3.8 ±0.83.

Mean ±SD of VAS occurred on 10th day after treatment for group A is 2.0 ± 0.70, for group B is 2.8 ± 0.54 and group C is 3.4 ±0.54.

Mean ±SD of VAS scores compared with in the groups as shown in table 5.2.

Difference of Mean ±SD of VAS with in group A show that gradual decrease from day "0" to day 5th (2.0±6.0) and from day "0" to day 10th (3.4 ± 0.54)

Difference of Mean ±SD of VAS within group B show that gradual decrease from day "0" to day 5th (1.2 ± 0) and from day "0" to day 10th (3.0 ± 0).

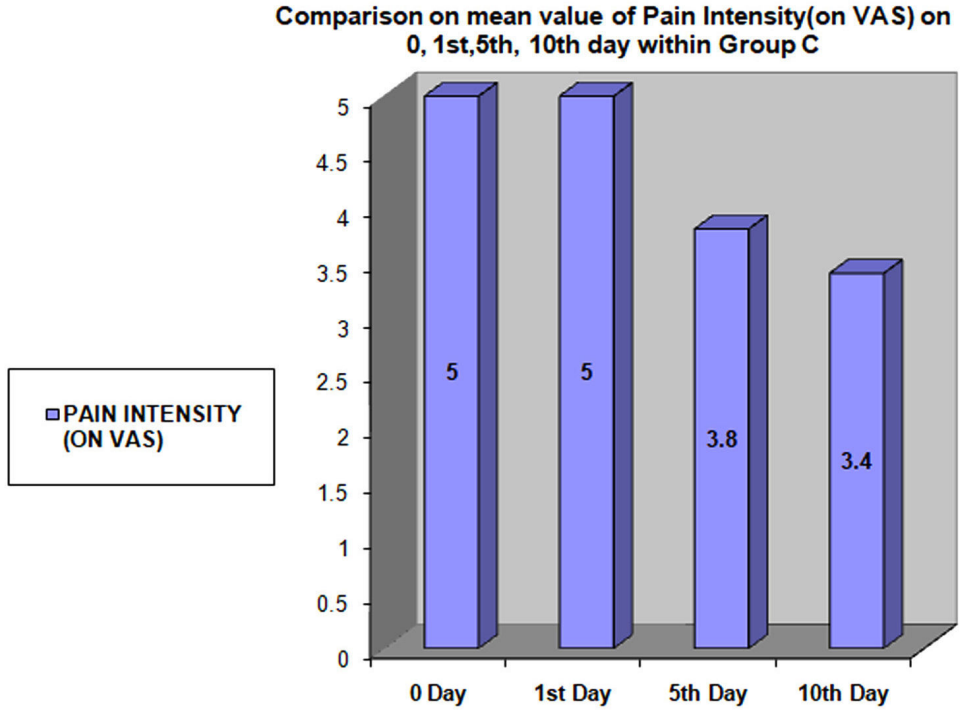
Difference of Mean ±SD of VAS within group C show that gradual decrease from day "0" to day 5th (1.2±-0.13) and from day "0" to day 10th (1.6 ± 0.16)

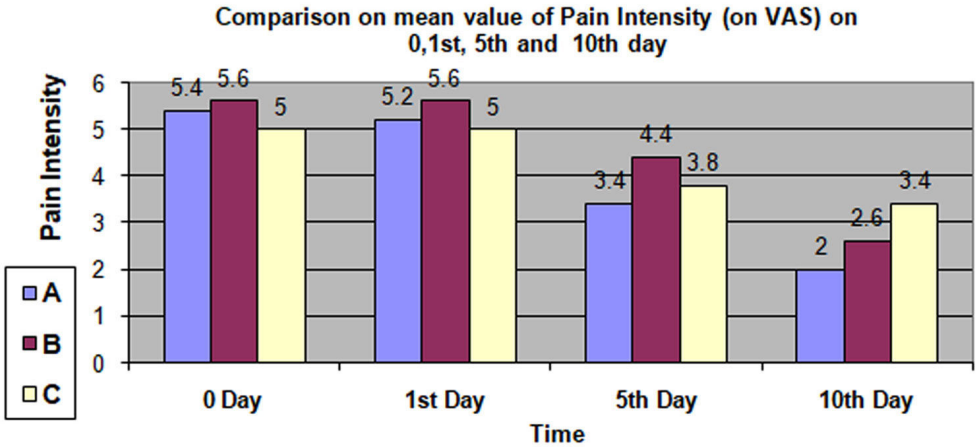
Table 1: Comparison of VAS between Group A, B and C

VAS	Group A Mean ±SD	Group B Mean ±SD	Group C Mean ±SD
Age	34±9.24	30.8±6.61	29.6±4.27
V0	5.4±1.14	5.6±0.54	5.0±0.70
V1	5.2±0.83	5.6±0.54	5.0±0.70
V5	3.4±0.54	4.4±0.54	3.8±0.83
V10	2.0±0.70	2.6±0.54	3.4±0.54

Table : 2 Comparison of VAS within Group A, B and C

Days Groups	V0 Mean ±SD	V1 Mean ±SD	V5 Mean ±SD	V10 Mean ±SD
Groups A	5.4±1.14	5.2±0.83	3.4±0.54	2.0±0.70
Groups B	5.6±0.54	5.6±0.54	4.4±0.54	2.6±0.54
Groups C	5.0±0.70	5.0±0.70	3.8±0.83	3.4±0.54





DISCUSSION

The results of this study showed that both ultrasound and laser along with stretching decrease the pain over 10 day treatment duration. Pain reduced in all three groups but methods used in group one much more effective in reducing pain in plantar fasciitis patients.

However, it was found that Ultrasonic therapy when combined with stretching techniques and Kinesio Taping method showed better results in relieving pain.

Limitation

Small sample size

Short duration of study

Future of Research

Future research can be conducted using a large sample. For a longer time period and ensuring proper follow up of treatment.

CONCLUSION

The results of this study suggest that Ultrasound and stretching, when clubbed with Kinesio Taping method, do have significantly better effect on pain relief in plantar fasciitis especially from day one itself, when compared to a combination of LASER along with stretching exercises.

However, which of the two is more efficient in completely recovering from the entire problem could not be ensured.

Clinical Relevance

Ultrasound and stretching, when clubbed with Kinesio Taping method, do have significantly better effect on pain relief in plantar fasciitis especially from day one itself, when compared to a combination of LASER along with stretching exercises.

Source of Funding: Self

Ethical Clerence

It is abonified work done by me and I have not taken any part of thesis from anywhere.

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