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Effect of IASTM Using M^{2}T Blade on Acute Heel Pain: A Pilot Study

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ABSTRACT
Background: *Heel pain is one of the most common pain observed in young adults. Heel pain can cause discomfort in performing day to day activities as there is complete weight bearing on ankle joint. M2T blade helps in releasing adherent fascia which in turn helps relieving pain.*
Materials and Methods: *15 subjects with acute heel pain between the age group of 18 – 40 years were assessed from KLE University's Campus, Belagavi, Karnataka. Subjects were assessed and were treated using M2T blade. Foot Function Index was the outcome measure used for pain assessment and pre and post readings were recorded.*
Result: *The present study showed 48.7% ($p<0.001$) reduction in heel pain intensity according to pre and post Foot Function Index score.*
Conclusion: *M2T blade is effective in reducing heel pain and increase functional activity of the foot immediately after the treatment.*
Key Words: *M2T Blade, Myofascial release, Instrument Assisted Soft Tissue Mobilization (IASTM), heel pain, foot function index, Range of Motion (ROM).*

INTRODUCTION

Heel pain is a commonly experienced health entity by general population. Significant discomfort and a limp can be a problem because of difficulty in weight bearing in cases of plantar heel pain[1].

The soft tissues at the heel functions as a shock absorber. It consists of subcutaneous structures which are arranged in a complex whorl. It contains adipose tissues that are attached with vertical fibers to the plantar aponeurosis and the dermis. 110% of body's weight during and 200% body's weight during running is absorbed by heel rendering it to be a vulnerable structure to disorganize.[1]

Largest bone in the foot is Calcaneus and while walking the heel is the first part to come in contact with the floor. Flexor digitorum brevis muscle, plantar fascia and a band of fibrous connective tissue are the structures when damaged can lead to heel pain. These structures are located at the sole of the foot[2]. Dorsiflexion of the toes applies traction stress at the origin of the plantar fascia. Even an over pronation, Limb length discrepancy, excessive lateral tibia torsion and excess femoral anti version, Inflammation of the structures associated with the heel bone, Gait abnormalities,a repetitive micro trauma of plantar fascia or inflammation of plantar fascia due to overuse, Biomechanical faults in the foot or and

deformity associated with the foot such as abnormal pronation and neural pathology can be the causes of heel pain[1,2,3]. The left heel gets affected first then right heel[2].

There are many causative factors of heel pain such as plantar fasciitis, fat pad atrophy, tarsal tunnel syndrome, plantar fascia rupture, spinal stenosis, PIVD etc.[1]

The presenting symptoms which a patient usually notices is pain in the heel while taking the first step in the morning and gradually the pain decreases as the patient continues walking[3].

There are various treatment options available such as conservative management, surgical intervention and physiotherapy management.

Instrument Assisted Soft Tissue Mobilization (IASTM) is a technique in which myofascial release is given through an instrument. There are many instruments such as fascial abrasion technique, foam roller, astym therapy, Graston technique etc., have been used previously[11].M[2]t blade is a newer equipment, developed in Canada by Mr. Adam Bogar which is used to reduce pain and to increase joint range of motion (Figure 1). The blade has 8 treatment planes[4]. 2,3,4 treatment plane numbers were used in this intervention.

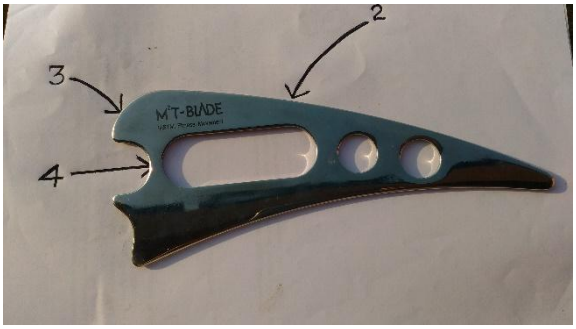


Figure:1

MATERIALS AND METHOD

Participants- 15 young adults

Inclusion Criteria

1. Individuals between the age of 18-30 years
2. Heel pain without any pathological condition or any trauma.
3. Subjects willing to participate.

Exclusion Criteria

1. Hypersensitive skin.
2. Trauma to the ankle joint.
3. Fractures associated with foot.
4. Any neurological conditions.

The study was carried out at KLE University's Institute of Physiotherapy Belagavi.

INTERVENTION

Figure:2

Figure:3

Figure:4

OUTCOME MEASURES

The outcome measure used to evaluate heel pain was Foot Function Index. The pain was assessed by asking the subjects to fill the foot function score between 1-10 where 1 symbolizes no pain and 10 symbolizes maximum pain[5].

The pain was assessed by using Foot Function Index before and after treatment.

OBJECTIVES

The main objective of this study was to find out the immediate effect of IASTM using M^2T blade on acute heel pain.

RESULT

Table 1: Distribution of male and females in the study

Gender	No of patients	% of patients
Male	6	40.00
Female	9	60.00
Total	15	100.00

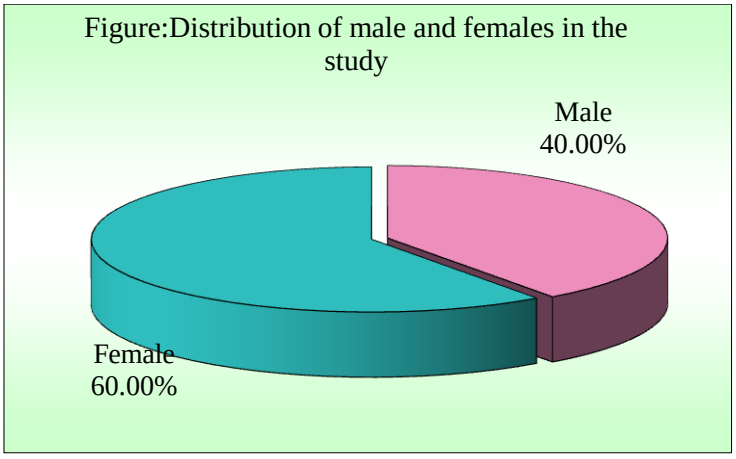


Figure 5: Gender wise distribution

Table 2: Summary of age and BMI in the study

Summary	Age in yrs	Weight (Kg)	Height (cm)	BMI
n	15.00	15.00	15.00	15.00
Minimum	20.00	40.00	144.00	16.40
Maximum	26.00	86.00	182.00	30.80
Range	6.00	46.00	38.00	14.40
Mean	22.73	58.93	161.27	22.58
Median	22.00	59.00	162.00	21.80
Mode	22.00	60.00	162.00	17.90
Standard Deviation	1.98	13.74	9.28	4.43
Standard Error	0.51	3.55	2.40	1.14

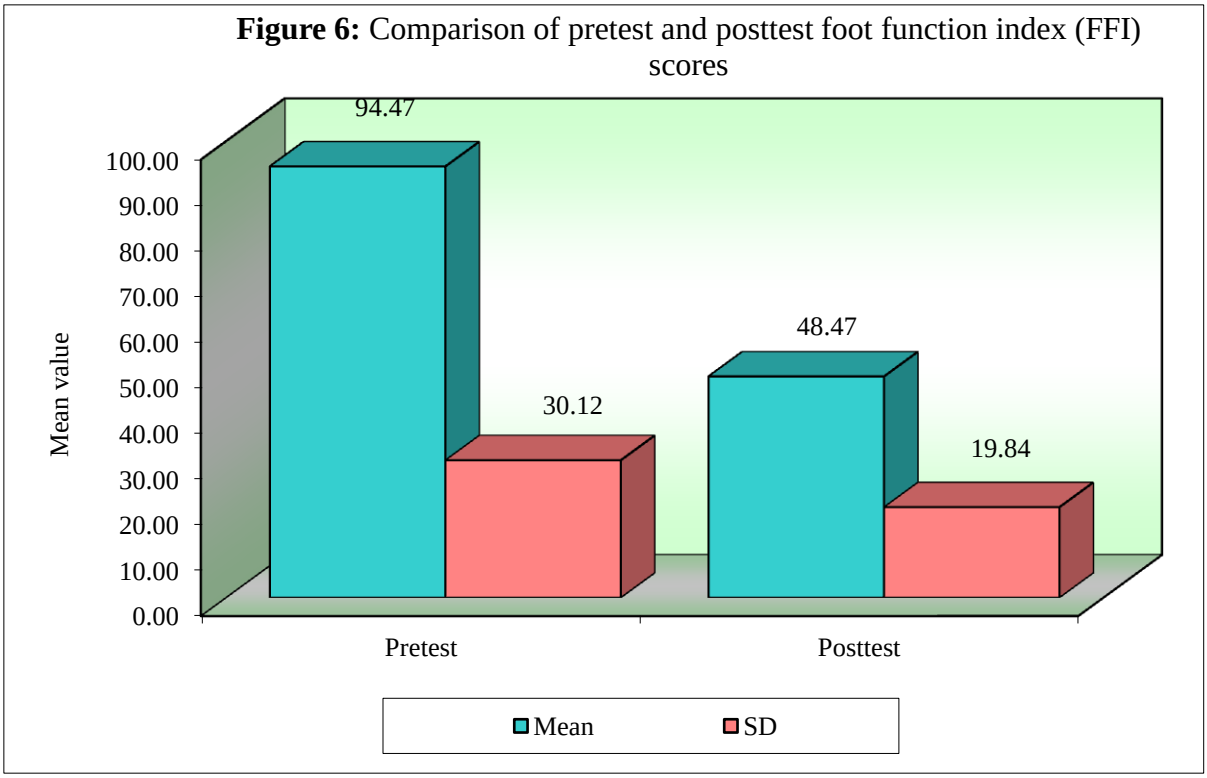
Table 3: Normality of pretest and posttest foot function index (FFI) scores by Kolmogorov Smirnov test

Time	Z-value	P-value
Pretest	0.4720	0.9790
Posttest	0.7070	0.7000

Table 4: Comparison of pretest and posttest foot function index (FFI) scores by dependent t test

Time	Mean	SD	Mean Diff.	SD Diff.	95% CI of the Difference		Paired t	p-value
					Lower	Upper		
Pretest	94.47	30.12						
Posttest	48.47	19.84	46.00 (48.7% effective)	26.64	31.25	60.75	6.6875	<0.001

Figure 6: Comparison of pretest and posttest foot function index (FFI) scores



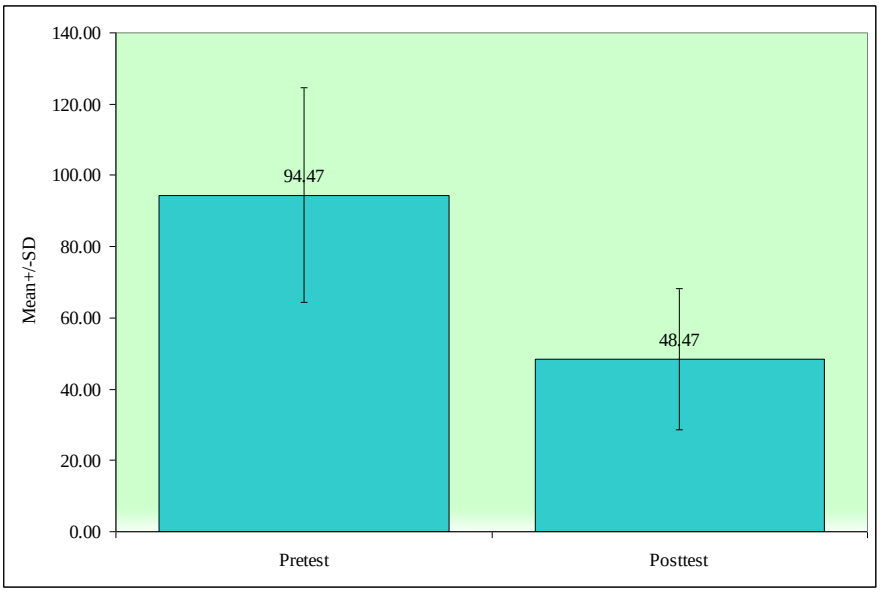


Figure 7: Comparison of pre and post intervention FFI score

DISSCUSSION

The present intervention done on heel pain subjects showed positive results in pain reduction and improved functional activity of ankle joint. There is one clinical trial done on recreational shoulder pain subjects with restricted range of motion and pain to check the immediate effect of M2T blade to release myofascial tightness. The study concluded that there was significant improvement in outcome measures which showed release of myofascia using M2T blade[4]. The outcome measure used for pain was Visual Analog Scale (VAS). Present study has been done on immediate effect of M2T on heel pain using Foot Function Index as outcome measure. Post intervention results demonstrated statistical and clinical significance similar to the above mentioned study. (Table 4, Figure 6)

Two studies have compared IASTM with a control group, whereas another study has

compared IASTM to soft tissue massage. Their results suggested that equal improvement in both the IASTM and the control/ massage group. IASTM did not prove to be better than the control groups in these studies[7,8,9,10].

Another study was done to compare IASTM fascial abrasion technique to foam rolling on hip and knee Range of Motion(ROM). ROM was assessed immediately post intervention and 24 hour follow up. The results revealed immediate increase in joint ROM when compared to the control group and joint ROM after 24 hours was preserved[11]. In the present study, immediate effects of M2T blade were assessed which showed immediate improvement in the scores of Foot Function Index post treatment which proves its efficacy in the treatment of soft tissue as proved by the above study.

In myofascial release the stretch is applied over the tight fascia and is maintained for 90-120 seconds to lengthen the tight fascia[5]. The same way stretch can be given to the tight fascia using the M2T blade till the adhesions are broken and fascia is released[4].In the MFR technique, the tighten fascia is soften by giving repetitive stretch[5]. The same effect is seen in this study where M2T blade is used on tighten fascia to soften it by giving repetitive fast strokes over it till the adhesions are broken and the fascia is release. In this study the fascia around the ankle was released and the length of the fascia was restored resulting in pain reduction. Myofascial release causes increase fibroblast numbers and causes controlled micro trauma which increases blood circulation in that particular area[6]. Similarly in this study after giving M2T blade there must have been increase in blood flow to the area resulting in immediate myofascial release.

Hence, this study of M2T blade done on heel pain proves to reduce pain and increase functional activities of ankle joint.

CONCLUSION

M2T blade is effective in reducing pain immediately in subjects with acute heel pain.

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