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To Determine Effectiveness of Iontophoresis V/S Kinesiological Taping In Pain and Disability In Case Of Planter Fascitis

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ABSTRACT:- Plantar fasciitis is the most common cause of planar heel pain. Its characteristics features are pain and tenderness, predominately on the medical aspect of calcaneus near the sole of the heel. Considering a complete differential diagnosis of plantar heel pains important, a comprehensive history and physical examination guide accurate diagnosis. Many nonsurgical treatment modalities have been used in managing the disorder, including rest, massage, nonsteroidal anti-inflammatory drugs, night splints, heel cups/pads, customs and off-the-shield orthoses, injection, casts and physical therapy measures such as shock wave therapy. Most reported treatment outcomes rely on anecdotal experiences or combinations of multiple modalities. Nevertheless, nonsurgical management of plantar fasciitis is successful in approximation 90% of patients. Surgical treatment is considered in only a small subset of patients with persistent, severe symptoms refractory to nonsurgical intervention for atleast 6 to 12 months. To study the effect of Iontophoresis and kinesio-taping on improvement of pain, ADL and disability in patient with plantar fasciitis. To compare for the improvement in dorsiflexion range of motion in patient with plantar fasciitis. On the basis of present study, it can be concluded that conservative treatment approach like physiotherapy in the treatment of plantar fasciitis, is beneficial. Although all the conventional treatment have found to be effective in alleviation of symptoms and associative disability in plantar fasciitis. However the subjects treated with Iontophoresis showed an additional benefit in terms of reduction of pain on VAS and functional ability in terms of FFI when compared with taping. Hence it can be concluded that Iontophoresis is an effective therapeutic option in the treatment of plantar fasciitis.

KEYWORDS: Iontophoresis, Kinesiological Taping, Plantar Fasciitis, Pain Management, Disability Reduction

I. INTRODUCTION

Plantar fasciitis is the most common cause of planar heel pain. Its characteristics features are pain and tenderness, predominately on the medical aspect of calcaneus near the sole of the heel. Considering a complete differential diagnosis of plantar heel pains important, a comprehensive history and physical examination guide accurate diagnosis. Many nonsurgical treatment modalities have been used in managing the disorder, including rest, massage, nonsteroidal anti-inflammatory drugs, night splints, heel cups/pads, customs and off-the-shield orthoses, injection, casts and physical therapy measures such as shock wave therapy. Most reported treatment outcomes rely on anecdotal experiences or combinations of multiple modalities. Nevertheless, nonsurgical management of plantar fasciitis is successful in approximation 90% of patients. Surgical treatment is considered in only a small subset of patients with persistent, severe symptoms refractory to nonsurgical intervention for atleast 6 to 12 months.

Heel pain is a common presenting complaint in the foot and ankle practice, and plantar fasciitis is the most common cause of chronic pain beneath the heel in adults, making up 11–15% of the foot symptoms requiring professional care among adults. It is estimated that 1 in 10 people will develop planterfascitis during their lifetime planterfascitis, which is more common in middle-aged obese females and young male athletes, has a higher incidence in the athletic population though not all suffering require medical treatment. In the literature, planterfascitis has been described as painful heel syndrome, chronic plantar heel pain, heel spur syndrome, runner's heel, and calcaneal periostitis.

Anatomy:-

The plantar fascia comprises 3 bands of dense connective tissue, which originate at the medial tubercle of the calcaneus and fan distally to insert into the base of each proximal phalanx (Figure 1). 3 First described by Hicks 4 in 1954 as the

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windlass mechanism, the plantar fascia tenses during the terminal stance to toe-off phases of gait. 3,4 This tension elevates and reinforces the medial longitudinal arch, which in turn allows the foot to function as a rigid lever for forward propulsion.

Figure 1. The plantar fascia supports the medial longitudinal arch by transmitting forces between the heel and forefoot during the late stance to toe-off phases of gait.

The plantar fascia supports the medial longitudinal arch by transmitting forces between the heel and forefoot during the late stance to toe-off phases of gait.



Figure-1 Anatomy of foot

Patho-anatomical features:-

The differential diagnosis of planterfascitis precedes an understanding of the local anatomy. The calcaneum is separated from plantar skin by a complete honeycombed fibro-fatty fat pad that acts as a shock absorber.

The posterior tuberosity of calcaneum has medial and lateral processes. The medial process gives attachment to the Flexor digitorum brevis, Abductor hallucis, and the medial head of Quadratus plante as well as the central band of plantar fascia.

The plantar fascia or deep fascia of the sole, proximally has a direct fibrocartilaginous attachment to the calcaneum (an enthesis), whose central band is constant along with medial and lateral band. It has a triangular shape and develops from the medial process of the calcaneal tuberosity, and diverges distally at mid-metatarsal level into five separate strands, which are attached at the forefoot onto the plantar skin, the base of proximal phalanges (via plantar plate), the metatarsophalangeal joints via the collateral ligaments and deep transverse metatarsal ligaments.⁹

Heel skin is innervated by the medial calcaneal nerve which may present with heel pain if compressed proximally (such as in tarsal tunnel syndrome). Boxter's nerve (the first branch of lateral plantar nerve) may be at risk of compression between AH and medial belly of the QP muscle.^{9,11}

Surgery:-

Recalcitrant cases where symptoms persist for more than 6-12 months, even after adequate conservative treatment are usually selected for surgery.²⁰ efore surgery nerve conduction and electromyographic studies should be considered to determine if the posterior tibial nerve is compressed.

Open or endoscopic plantar fascia release may be done. Some advantages of endoscopic plantar fasciotomy include: minimal soft tissue dissection, excellent visualization of the plantar fascia, minimal post operative pain, and earlier return to work, However, the American Orthopaedic Foot and Ankle Society recommends that in case of suspected nerve compression, endoscopic release should be avoided³⁷ll in all, still, the procedure of choice is open partial plantar fascia release with simultaneous release of first branch of lateral plantar nerve.⁹ large cohort study indicates that 70% of patients showed improvement following surgery but only 50% of patients displayed complete satisfaction.

Following complete division of the plantar fascia, the development of pes planus, secondary hallux valgus, or hammer toes are expected, and therefore orthotics are required lifelong post- operatively.²¹

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II. OBJECTIVES

- To study the effect of Iontophoresis and kinesio-taping on improvement of pain, ADL and disability in patient with plantar fasciitis.
- To compare for the improvement in dorsiflexion range of motion in patient with plantar fasciitis.

III. HYPOTHESIS

Experimental- we hypothesis that the use of Iontophoresis is more effective than kinesio- Taping in patient of plantar fasciitis together with other conservative method of treatment.

Null- The use of Iontophoresis is not as effective as kinesio-taping together with other methods of treatment of plantar fasciitis.

IV. METHODOLOGY

STUDY DESIGN - Experimental study.

POPULATION- Patients with plantar fasciitis (n=30) in between the age of 30-45 years (15 male, 15 female) were selected for the study

SOURCE OF DATA- the pt. were referred by the physicians and orthopaedicians from their physiotherapy department(Phsio Heal & Cure) and the study was conducted **as Ayush hospital & research center near prabhat petrol pump raisen road bhopal(M.P.)**

SAMPLE SIZE - 30 male and female subjects in the age group of 30-45 years satisfying the sampling criteria. **SAMPLING TECHNIQUE** - Block randomization.

INCLUSION CRITERIA

Subjects were selected for the study if they fulfill the following criteria:

- Clinically diagnosed cases of plantar fasciitis not less than 1 week.
- Those who were willing to participate in the study and willing to take treatment for 28 successive days.
- Heel pain felt maximally over plantar aspect of heel.
- Pain in the heel on the first step in the morning.
- No history of rest pain in heel.

EXCLUSION CRITERIA

- Subjects with clinical disorders where therapeutic ultrasound is contraindicated such as infective conditions of foot, tumor, calcaneal fracture, metal implant around ankle.
- Subjects with impaired circulation to lower extremities.
- Subjects with referred pain due to sciatica and other neurological disorders.
- Arthritis.
- Corticosteroids injection in heels preceding 3 months.

Instrumentation and Measurement

Standard Goniometre – Range of motion were measured by the goniometer. Goniometer is advice used to mesure the motion of different joints of the body.

FFI – Disabilities were measured using the foot function index. Foot function index is a measure which is designed to measure the impact of foot pathology on function in terms of pain, disability and activity restriction. It consist of 3 subscale addressing pain and disability and activity restriction. Each question is scored from 0 to 10.

VAS – Pain was measured using Virtual Analog Scale. VAS is consisting of 10 cm scale. The patient is instructed to make a mark on the line at a right angeat a point which represents the level of pain. The distance is measured on cms.

VARIABLE

Independent Variables

- Stretching
- Strengthening
- Ultrasound

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Dependent Variables

- Range of motion
- FFI
- VAS

V. RESULT AND ANALYSIS

				Descrip	otive			
					95% Confid	ence Interval		
					for 1	Mean		
			Std.		Lower	Upper		
	Ν	Mean	Deviation	Std. Error	Bound	Bound	Minimum	Maximxima
VAS1	10	6 1000	1 79196	56667	4 8181	7 3819	3.00	
1	10	5 8000	1 75119	55377	4 5473	7.0527	4 00	
1	10	5,0000	1 79196	56667	4 6181	7.1819	4.00	
2	20	5.0333	1.72073	.50007	5 2008	6 5750	4.00	
2	50	5.9555	1.72075	.51410	5.2908	0.5759	5.00	
2								
3								
T (1								
I otal	10	• • • • • •	0.4204	20011	1.0056	0.6744	1.00	
VAS2	10	2.0000	.94281	.29814	1.3256	2.6744	1.00	
1	10	1.1000	.56765	.17951	.6939	1.5061	0.00	
	10	2.7000	.67495	.21344	2.2172	3.1828	2.00	
2	30	1.9333	.98027	.17897	1.5673	2.2994	0.00	
3								
Total								
FFI1	10	94.2000	37.74122	11.93482	67.2016	121.1984	40.00	
1	10	91.5000	30.11552	9.52336	69.9567	113.0433	64.00	
	10	89.5000	36.54905	11.55783	63.3544	115.6456	50.00	
2	30	91 7333	33 79240	6 16962	79 1150	104 3516	40.00	
2	50	21.7555	55.77210	0.10902	79.1150	101.5510	10.00	
3								
5								
Total								
	10	28 2000	10 72601	2 20215	20 5264	25 0726	14.00	
	10	28.2000	10.72091	3.39213	20.3204	33.8730	14.00	
1	10	19.9000	4.93176	1.55956	16.3720	23.4280	9.00	
	10	43.2000	6.59630	2.08593	38.4813	47.9187	35.00	
2	30	30.4333	12.36704	2.25790	25.8154	35.0513	9.00	
3								
Total								
ROM1	10	16.2000	1.54919	.48990	15.0918	17.3082	14.00	
1	10	16.6000	1.26491	.40000	15.6951	17.5049	15.00	
	10	16.7000	1.63639	.51747	15.5294	17.8706	14.00	
2	30	16.5000	1.45626	.26588	15.9562	17.0438	14.00	
3								
Total								
ROM2	10	18.6000	.96609	.30551	17.9089	19.2911	17.00	
1	10	18.8000	.91894	.29059	18,1426	19.4574	18.00	
1	10	18 3000	94868	30000	17 6214	19 9786	16.00	
2	30	18 5667	03576	17075	18 217/	10 0150	16.00	
	50	10.5007	.75520	.17075	10.21/4	17.71.57	10.00	

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	Berneen		-	.200		••=>
	Groups					
	Within	85.400	27	3.163		
	Groups					
	Total	85.867	29			
VAS2	Between	12.867	2	6.433	11.580	.000
	Groups					
	Within	15.000	27	.556		
	Groups					
	Total	27.867	29			
FFI1	Between	111.267	2	55.633	.046	.956
	Groups					
	Within	33004.600	27	1222.393		
	Groups					
	Total	33115.867	29			
FFI2	Between	2789.267		1394.633	22.875	.000

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	Groups		2			
	Within	1646.100		60.967		
	Groups		27			
	Total	4435.367				
			29			
ROM1	Between	1.400	2	.7000	.314	.733
	Groups					
	Within	60.100	27	2.226		
	Groups					
	Total	61.500	29			
ROM2	Between	1.267	2	.633	.710	.501
	Groups					
	Within	24.100	27	.893		
	Groups					
	Total	25.367	29			

Post Hoc Tests

Multiple Comparisons

Dunnett t (20-si	ded) ^a		r r			
Dependent	(I)	Mean Difference (I-	Std.	Sig.	95% Confidence	
(J)		J)	Error		Interval	
Variable	GROUP			F	Lower Bound	Upper
GROUP						Bound
VAS1	2					
	1	30000	.79536	.902	-2.1559	1.5559
	3					
	1	20000	.79536	.955	2.0559	1.6559
VAS2	2					
	1	90000^{*}	.33333	.022	1.6778	1222
	3					
	1	.70000	.33333	.081	-0.0778	1.4778
FFI1	2					
	1	-2.70000	15.63581	.978	-39.1848	33.7848
	3					
	1	-4.70000	15.63581	.936	-41.1848	31.7848
FFI2	2					
	1	-8.30000*	3.49190	.046	-16.4480	1520
	3					
	1	15.00000*	3.49190	.000	6.8520	23.1480
ROM1	2					
	1	.40000	.66722	.775	-1.1569	1.9569
	3					
	1	.50000	.66722	.677	-1.0569	2.0569
ROM2	2					
	1	.20000	.42251	.851	7859	1.1859
	3					
	1	30000	.42251	.703	-1.2859	.6859

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DEMOGRAPHIC DATA One-Sample Statistics

	Ν	Mean	Std. Deviation	Std. Error Mean
AGE	30	38.0333	5.32064	.97141
SEX	30	1.5000	.50855	.09285
HEIGHT	30	5.3210	.23157	.04228
WEIGHT	30	59.0333	11.83648	2.16104
BMI	30	21.9880	2.56398	.46812

VI. CONCLUSION

On the basis of present study, it can be concluded that conservative treatment approach like physiotherapy in the treatment of plantar fasciitis, is beneficial. Although all the conventional treatment have found to be effective in alleviation of symptoms and associative disability in plantar fasciitis. However the subjects treated with Iontophoresis showed an additional benefit in terms of reduction of pain on VAS and functional ability in terms of FFI when compared with taping. Hence it can be concluded that Iontophoresis is an effective therapeutic option in the treatment of plantar fasciitis.

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