ROLE OF PHYSICAL MEDICINE AND REHABILITATION INTERVENTION FOR PLANTAR FASCIITIS

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ABSTRACT

Objective: To highlight the role of early physical medicine and rehabilitation.

Design: Randomized case control study.

Place and Duration of Study: Armed Forces Institute of Rehabilitation Medicine Rawalpindi from March 2002 to March 2003.

Patients and Methods: Eighty patients of both sexes between 25-45 years of age were randomly divided into Study and Control group. Group 1 (study) was given standard physiatric therapeutic intervention and Group 2 (control) was given conventional treatment with heel cup and Non Steroid anti inflammatory drugs (NSAIDs). They were followed up for three months. Pain was assessed by Visual Analog Scale (VAS) and Heel Tenderness Index (HTI).

Results: Mean age of the patients was 35.7 years. Forty percentage cases were male and 60 % were female. After three months of treatment, 75% of group 1 and 20% of group 2 showed marked improvement (VAS < 30mm). On HTI index, 72.5% of patients were in Grade 0 (no pain) and 22.5% were in Grade I while 30% of patients in group 2 were in grade 1 (painful). Difference was found to be statistically significant i.e. P- value < 0.05.

Conclusion: Comprehensive rehabilitation management has shown promising results in the treatment of plantar fasciitis especially when initiated in early stages and may prove to be the mainstay modality in the treatment of plantar fasciitis in future.

Keywords: Plantar fasciitis, rear foot pain, heel spur

INTRODUCTION

Plantar fasciitis is one of the most common causes of rear foot heel pain in adults. Classical clinical presentation is severe heel pain that occurs upon weight bearing activity after a period of rest, most commonly in morning. The pain normally resolves within hour, but returns in the evening after prolonged standing.

The pain of plantar fasciitis is caused by collagen degeneration associated with repetitive microtears of the plantar fascia secondary to stress overload at the medial tubercle of calcaneum [1].

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As these days greater emphasis is placed on physical fitness and running, the incidence of plantar fasciitis is likely to increase.

Several studies [2-4] compared various treatment modalities with various degrees of success but there is no clear cut treatment protocol available and it ranges from NSAIDs and heel cup that is most commonly used to surgery. Therefore, need for a continuous research for effective conservative treatment modalities for plantar fasciitis exists.

Physical medicine and rehabilitation is an upcoming specialty and is showing promising results in treatment of plantar fasciitis especially when starts earlier. Its intervention include rest, stretching, strengthening exercise, physical modalities, orthotics, night splints, anti inflammatory agents, nerve blocks [5] and corticosteroid injections. The

majority of patients will improve or be fully relieved by non-surgical treatment [6,7]. However, even with appropriate treatment, plantar fasciitis may become chronic and recalcitrant in nature eventually leading to surgery. But there is no definite surgical treatment without complications and may be associated with an alteration of foot biomechanical integrity, prolonged healing time and post operative rehabilitation [8-11].

In view of above facts, the study was carried out on adult diagnosed cases of plantar fasciitis at "Armed Forces Institute of Rehabilitation Medicine Rawalpindi (AFIRM)" in the year March 2002 to March 2003. Basic aim of study was to highlight role of early comprehensive rehabilitation treatment programme in final outcome of plantar fasciitis.

MATERIAL AND METHODS

The study of one year duration was conducted at AFIRM, Rawalpindi, which is a tertiary health care center.

After taking informed consent, 80 diagnosed cases of plantar fasciitis were randomized into study group and control group by simple random sampling. An effort was made to make the study double blind ensuring neither the therapist nor the patient is aware of the group constitution.

Group 1 that is Study group was given standard physiatric therapeutic treatment. For first fifteen days, they were given stretching, NSAIDs, ice and ultrasound therapy at frequency 0.5 watts/cm 2 and intensity ranging from 2 to 3 MHz. Later they were given stretching exercises of calf muscles, TA and plantar fascia, strapping (counter force taping to give fascia rest without decreasing activity), strengthening exercises arch support and night splints.

Group 2, which is the control group, was given heel cups and NSAIDs only. Cases were evaluated at presentation, and were followed up fortnightly for one month, then monthly for next two months. On each evaluation, questions were asked about pain on first step in morning and was assessed by visual analog scale (VAS; 0mm= no pain, 100mm incredibly severe pain) and tenderness at heel was assessed by heel tenderness index (HIT; 0 = no pain, 1 = painful, 2 = painful and winces, 3 = painful, winces and with drawl. After three months, marked improvement was considered when Visual Analog Scale was less than 30.

For data analysis, computer based SPSS version 10.0 was used. On each visit, relevant test of significance was applied such as Paired Sample T test to compare results between two groups on Visual Analog Scale and Chi-square test was applied to compare results between two groups on Heel Tenderness Index. P-Value of less than 0.05 was considered statistically significant.

RESULTS

Mean age of the patients was found to be 35.6 and 35.73 years with standard deviation of 6.7 and 6.9 for group 1 (study group) and group 2 (control group) respectively. Forty percent (32) cases were male and 60% (48) were female (Fig 1 & 2).

On first visit, mean VAS of the group 1 was 77.5 and group 2 was 77(Table-1). A 12.5 % (5) patient of group 1 and 10% (4) patients of group 2 were in Grade I (painful) on HT Index (Table-3). Difference was found to be statistically not significant as P- value >0.05 (p-value 0.892) (Table-2).

On second visit (fifteen day), mean VAS of group 1 and group 2 was reduced to 56 and 72 respectively (Table-1). No. of patients in Grade I (painful) on HTI was 35% (15) and 15% (6) in group 2. No patient of both groups were found to be in grade 0 (no pain) on HT Index (Table-3). P value was found to be less than 0.05.

On third visit (1 month), mean VAS of group 1 and group 2 was 42.25 and 67 respectively (Table-1). No. of patients in Grade I (painful) on HTI was 60% (24) and grade 0 (no pain) were 10% (4) while 15% (6) of group 2 were in grade I (painful). No patient of group 2 was found to be in grade 0

(no pain) on HT Index (Table-3). P value was found to be less than 0.05.

On fourth visit (2 months), mean VAS of group 1 and group 2 was 31.75 and 60.5 respectively (Table-1). 16(40%) patients were in grade 0 and 20 (50%) were in grade I (painful) in group 1, while 8 (20%) patients of group 2 were in grade 1(painful, Table-3). Difference was statistically significant i.e P-value less than 0.05.

On last visit (3 months), mean VAS of group 1 (study group) was reduced to 22.5 and 56.5 in group 2 (control group, Table-1). 70% of group 1 and 20% of group 2 had VAS < 30mm. On HTI index, 72.5% (29) of patients were in Grade 0 (no pain) and 9 (22.5%) were in grade I while 12 (30%) of patients in group 2 were in grade 2 (painful, Table-3). Difference was found to be statistically significant i.e. P- value < 0.05.

Even for recalcitrant cases, taping and casting of foot is better option rather than surgery. Surgical intervention should be reserved for intractable cases as there is no definite surgical treatment without complications [12].

Randomized controlled trials have evaluated night splints [6], dexamethasone iontophoresis [10], corticosteroid injection [13], orthosis [14], and extracorporeal shock wave lithotripsy (ECSL) trials [15] and surgery [2, 3].

In the current study, mostly patients were soldiers or obese middle aged women. Mean age 35 years with minimum age being 25 years and maximum 45 years., It is comparative to other international studies in which two patient cohorts seem to have particularly high incidence of plantar fasciitis: obese middle aged woman and young male runners [15,16].

Table-1: Follow up of patients with visual analogue scale.

Visit no	Visual analogue scale (vas)	N	Mean	Std. Deviation	Minimum	Maximum
First	Vas (group 1)	40	77.5	15.973	50	100
	Vas (group 2)	40	77	16.518	50	100
Second	Vas (group 1)	40	56	18.369	30	100
	Vas (group 2)	40	72	18.145	30	100
Third	Vas (group 1)	40	42.25	20.567	10	90
	Vas (group 2)	40	67	17.570	30	100
Fourth	Vas (group 1)	40	31.75	21.23	0	80
	Vas (group 2)	40	60.5	20.872	10	100
Fifth	Vas (group 1)	40	22.50	18.913	0	70
	Vas (group 2)	40	56.50	21.31	10	90

Table-2: Paired samples test.

Visit no		Paired differences					T value	Df	P-value
		Mean	Std Deviation	Std Error mean	95% confidence interval of the difference				
					Lower	Upper			
First	Vas gp1 - vas gp2	0.500	23.0885	3.6506	-6.884	7.884	0.137	39	0.892
Second	Vas gp1 - vas gp2	-16.0000	25.29822	4.00000	-24.0908	-7.9092	-4.000	39	.000
Third	Vas gp1 - vas gp2	-24.7500	26.50472	4.19076	-33.2266	-16.2734	-5.906	39	.000
Fourth	Vas gp1 - vas gp2	-28.7500	29.88761	4.72565	-38.3085	-19.1915	-6.084	39	.000
Fifth	Vas gp1 - vas gp2	-34.0000	26.38959	4.17256	-42.4398	-25.5602	-8.148	39	.000

DISCUSSION

About 70-90% of patients having plantar fasciitis will improve or fully relieved by conservative treatment, if comprehensive rehabilitation programme is initiated earlier in course of disease.

To see whether there is significant improvement with comprehensive rehabilitation treatment programme, patients were assessed on the VAS and HTI on 0, 15, 30, 60 and 90 days. After 90 days, marked improvement was considered when VAS was less than 30. Statistical analysis shows P value

<0.05 in all follow-ups, which goes in favour of better results with this treatment protocol.

Table-3: Heel tenderness index.

Visit No	Heel Tenderness Index	No pain	Painful	Painful and winces	Painful, winces and with drawl
First	Group 1	-	5 (12.5%)	14 (35%)	21 (52.5%)
	Group 2	-	4 (10 %)	16 (40%)	20 (50%)
Second	Group 1	-	15 (37.5%)	18 (45 %)	7 (17.5 %)
	Group 2	-	6 (15 %)	19 (47.5 %)	15 (37.5 %)
Third	Group 1	4 (10 %)	24 (60%)	10 (25%)	2 (5%)
	Group 2	-	6 (15 %)	24 (60%)	10 (25%)
Fourth	Group 1	16 (40%)	20 (50%)	4 (10%)	-
	Group 2	-	8 (20%)	23 (57.5%)	9 (22.5%)
Fifth	Group 1	29 (72.5%)	9 (22.5%)	2 (5%)	-
	Group 2	-	12 (30%)	21 (52.5%)	7 (17.5%)

In one study [17], about 85-90% of patients respond to rehabilitation programme within 6 months. In the study, success rate was 75% which is slightly less probably due to the fact that follow up period was 3 months.

In another study [18], 411 patients with plantar fasciitis heel cups were ranked as the least effective of eleven different treatments. The same was proved in the study as success rate with heel cups and NSAID's was only 20%.

On the first day of the study, no patient was with pain score of < 30, on 90th day there were 30 patients (75%) of group 1 (study) and 08 patients (20%) of group 2 (control) showing marked recovery that was slightly less than one international study [19] which showed 87.5% of the patients having marked recovery.

CONCLUSION

Plantar fasciitis is a common cause of the heel pain in adults. The disorder classically presents with pain that is particularly severe with first few steps taken in the morning and in evening after prolonged standing. Although, it is a self limiting condition, but unfortunately, if not treated properly and in time, morbidity rate is increased and the time until resolution may be prolonged to even more than a year. It may also eventually lead to surgery.

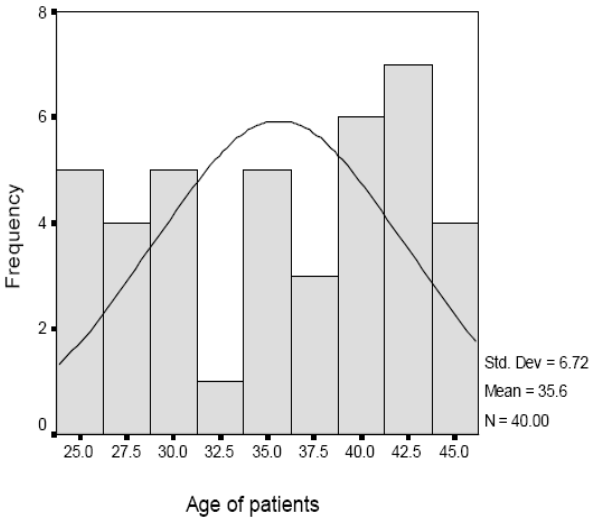

Fig-1: Age of patients and frequency (group 1).

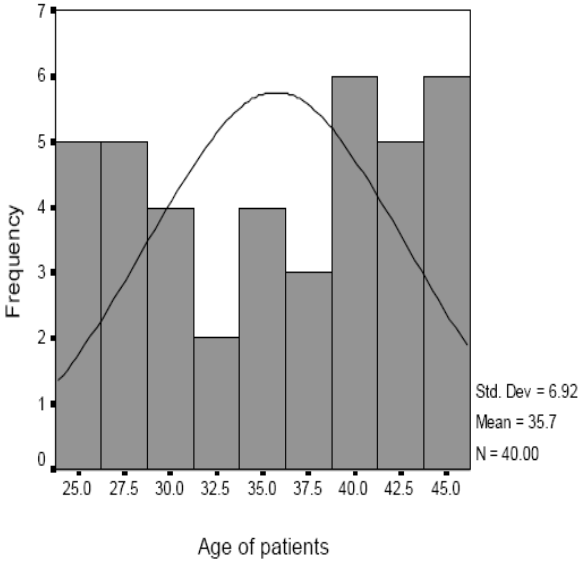

Fig-2: Age of patients and frequency (group 2).

Physical medicine and rehabilitation is an upcoming specialty and is presenting a comprehensive rehabilitation programme

which hastens recovery after Plantar Fasciitis, expedite return to normal routine and activity, decreases the chances of chronicity and reduces the morbidity related to it.

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