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LOCAL STEROID INJECTION FOR TREATMENT OF PLANTER FASCIITIS. COMPARISON BETWEEN METHYLPREDNISOLONE AND DEXAMETHASONE

1. **GULZAR SAEED AHMED**
MBBS FCPS
2. **ALTAF HUSSAIN SHAIKH**
MBBS FCPS, MS
3. **MOHAMMAD TOFIQUE**
FCPS

1. ***Associate Prof.***
Department of Orthopedic surgery and traumatology
Liaquat University of Medical and Health Sciences
Jamshoro.Hyderabad
2. ***Assistant Prof.***
Department of Orthopedic surgery and traumatology
Liaquat University of Medical and Health Sciences Jamshoro./
Hyderabad
3. ***Medical Superintendent***
Sindh Services Hospital
Karachi

Correspondence :
DR. GULZAR SAEED AHMED
A-9 Block C, Unit-6, Latifabad
Hyderabad.
Phone: +92-333-2601173

ABSTRACT:

Background: Plantar fasciitis causes medial heel pain which is severe with the first few steps in the morning and after long duration of rest.It affects about 10% of population and makes 15% of all foot complaints in adults. It is usually treated by conservative methods. These include, anti inflammatory medication, prefabricated foot orthosis, customized functional foot orthosis , corticosteroid injection, physical therapy, stretching exercises, and extracorporeal shock wave therapy. Despite the widespread use of corticosteroid injection we have found very few studies comparing various types of steroids available. The aim of our study was to compare the effects of methylprednisolone acetate and dexamethasone in the treatment of planter fasciitis.

Material & Methods: The inclusion criteria was adult patients of either sex having pain in heel for a minimum period of 12 weeks and were not satisfied with the treatment received during that period

Patients were randomized in two groups , A and B. Patients in Group A were injected with a mixture of 1cc(40 mg) methylprednesolone and 1cc of 2% lignocain .Patients in Group B, were injected with a mixture of 1ml of 4mg/ml of dexamethasone phosphate and 1cc of 2% lignocain. Patients were called for follow up examination at 4,8, & 12 weeks.

Pain was recorded on visual analog scale (VAS) with 0 as no pain, 1to 20 as mild , 21to40 as moderate, 41 to 60 as sever and 61 to 100 as very severe pain. The results were recorded as good if the patients has no pain at 4,8 and 12 weeks, fair if there is significant decrease in pain by 4to 8 weeks and no pain at 12 weeks, and poor if there is some relief at 4 and no relief at 8 and 12 weeks after injection.

Results: A total of 60 patients were recruited in the study. Thirty four(56.66%) were male and 26(43.33%) female. Thirty patients were placed in each group. The age range was between 35 to 65 years, (mean 48.267+ 8.517). The results were assessed in terms of pain, adverse events, at 4,8, and 12 weeks. Twelve weeks after injection, 90% in group A and 26.66% in group B had no pain, 0% in group A and 43.33% in group B had mild pain, 0% in group A and 10% in group B had moderate pain, and 10 % in group A and 20 % in group B had severe pain. (VAN group A 5.33+16.344, group B 19.5000+19.08917. P value 0.010.)The results in group A were, Good in 24,fair in 3 and poor in 3 patients. In group B the results were good in 4, fair in 4 and poor in 22 patients.

Conclusion: local methylprednisolone injection is superior to local dexamethasone injection, in providing short term pain relief to the patients with planter fasciitis.

Key words: Planer fasciitis. Steroid. Methylprednisolone, dexamethasone

INTRODUCTION:

Plantar fasciitis causes medial heel pain which is severe with the first few steps in the

morning and after long duration of rest. Pain usually decreases after walking for sometime but can return during the day time on continues weight bearing. On examination there is tenderness at the site of medial calcaneal tuberosity and proximal part of planter fascia.[1]

It is described as self limiting condition in literature.[2] It resolves over time regardless of treatment type. But it can be very painful and disabling, badly affecting quality of life. [3] Plantar fasciitis is the most common cause of chronic heel pain after trauma. It affects about 10% of population and makes 15% of all foot complaints in adults.[4] It is mostly seen in patients more than 40 years of age, athletes, and patients who are obese or over weight. Mechanical overload is found to be the main factor in the development of this condition. There is no relationship with gender.[5]

The incidence doubles in patients having body mass index between 25kg/m2 and 30 kg/m2, and triples in patients having passive dorsiflexion of ankle less than 10 degrees. Repeated micro trauma in the plantar fascia leads to traction periostitis, micro tears and degeneration.[6]

This condition makes about 8% of all running related injuries.[7] The condition was previously considered as inflammatory syndrome, however studies have shown a non-inflammatory degenerative process. Common pathological features are deteriorating collagen, increased ground substance protein, and areas of fibroblastic proliferation and increased vascularity.[8] Radio logically 28% to 66% of patients with plantar fasciitis has calcaneal spurs.[9]

Planter fasciitis is usually treated by conservative methods. These include, anti inflammatory medication, prefabricated foot orthosis, customized functional foot orthosis and corticosteroid injection, physical therapy, stretching exercises, extracorporeal shock wave therapy provide relief to the 80% of patients.[10] Surgical transaction is the option when conservative treatment fails.[11] A survey of American podiatrists and orthopedic surgeons revealed that about 75% of clinicians use and /or recommend the corticosteroid injection for this condition.[12 13] Despite the widespread use of corticosteroid injection we have found very few studies comparing various types of steroids available. We have conducted a comparative study analyzing the effect of methylprednisolone acetate, and dexamethasone.

The aim of our study was to compare the effects of methylprednisolone acetate and dexamethasone in the treatment of planter fasciitis.

MATERIAL AND METHODS:

The inclusion criteria was adult patients of either sex having pain in heel for a minimum period of 12 weeks and were not satisfied with the treatment received during that period. The severity of pain was a minimum of 30 mm on a 100 mm visual analogue scale. On palpation there was tenderness at the site of medial calcaneal tubercle or at the site of proximal plantar fascia. The exclusion criteria was, history of having local steroid injection during the past 6 months, pregnancy, rheumatoid arthritis, trauma, infection around the injection site, diabetes mellitus and use of walking aids.

Patients were randomized in two groups group A and Group B. Patients in Group A were injected with a mixture of 1cc(40 mg) methylprednesolone and 1cc of 2% lignocain .Patients inGroup B, were injected with a mixture of 1ml of 4mg/ml of dexamethasone phosphate and 1cc of 2% lignocain.

Injection was performed with 23 gauge,(25mm) needle and Luer-lock syringe. Aseptic technique was observed to minimize the risk of infection. The needle was inserted from medial side at the area of tenderness in the region of proximal part of planter fascia. Sporting activity , running was not allowed for 2 weeks after the injection.

Patients were called for follow up examination at 4,8,&12 weeks. Primary outcome measures were pain relief on first step, no tenderness on palpation at medial calcaneal tubercle and the site of proximal part of planter fascia. The secondary end points were persistent pain at 4,8&12 weeks post injection, infection.

Pain was recorded on visual analog scale (VAS) with 0 as no pain, 1to 20 as mild , 21to40 as moderate, 41 to 60 as sever and 61 to 100 as very severe pain.

The results were recorded as good if the patients has no pain at 4,8 and 12 weeks, fair if there is significant decrease in pain by 4to 8 weeks and no pain at 12 weeks, and poor if there is some relief at 4 and no relief at 8 and 12 weeks after injection.

Statistical analysis:

The data were entered and analyzed in statistical program SPSS version 16.0. Qualitative data such as gender, mode of treatment (group: injection methylpredinsolone+lignocaine (A) and injection Dexamethasone + lignocaine (B)) were presented as n(%) and chi square test was applied to compare the proportions between groups (A&B). The continues variables like age, visual analog scale were presented as Mean + Standard Deviation and student “t” test was used to compare the means (2 tailed) between groups (a & B). All the data were calculated on 95% confidence interval. P value < 0.05 was considered as statistically significant level for all the comparisons.

RESULTS:

A total of 60 patients were recruited in the study. Thirty four(56.66%) were male and 26(43.33%) female.(table 1). Thirty patients were placed in each group. Group A include 18(60%)male and 12(40.0%)female,and Group B include 16 (53.3%)Male and14(46.7%)female patients.

The age range was between 35 to 65 years, (mean 48.267+ 8.517)(table 2).

The duration of symptoms of patients in group A at the time of presentation was 12 to 18 weeks (mean 14.13 weeks), and those in group B was 12 to 18 weeks (mean 14.2weeks)

The results were assessed in terms of pain, adverse events, at 4,8, and 12 weeks.

Adverse events were seen in total of 8 /60(13.33%) patients. five patients in group A and 4 in group B, experienced increased in pain after injection which continued for 24 to 48 hours and then decreased. Two patients in group A and four patients in group B developed swelling after injection which subsided in 24 to 48 hours.

At base line 16.66% of patients in group A and 10% of patients in group B had moderate pain, 50% in group A and 53.33% in group B had severe pain, and 33.33% in group A and 36.66% in group B had very severe pain.(VAN Group A 55.50+ 13.088, group B 58.00+ 11.4921. P value 0.404)

Four weeks after injection, 76.66% in group A and 13.33% of patients in group B had no pain, 13.33% in group A and 33.33% in group B had mild pain, 0% in group A and 40% in group B had moderate pain, and 10% in group A and 13.33% in group B had severe pain.

TABLE NO. 1 (n = 60)

variable	Group A (n=30)	Group B (n=30)	total(n=60)
male	18(60%)	16 (53.3%)	34(56.66%)
female	12(40.0%)	14(46.7%)	26(43.33%)

No statistics are computed because Group is a constant.

TABLE NO. 2 (n = 60)

variable	Mean —+std.dev	t value	df	P value
age	48.267+ 8.517	43.898	59	‹0.000

Results are presented as Mean + Standard Deviation
* p value is statistically highly significant calculated by student t test

TABLE NO 3 (n = 60).
Number of patients with Mild moderate and severe pain in each group.

Variable	Group A: (n = 30)	Group B: (n = 30)	Chi square value	df	P value
Baseline Visual analog scale:					
21to 40 (Moderate Pain)	5(16.66%)	3(10.0%)	0.580	2	0.748
41 to 60 (Severe pain)	15(50.0%)	16(53.33%)			
61 to 80 (very Severe pain)	10(33.33%)	11(36.66%)			
Visual analog scale at 4 weeks:					
0 no pain	23(76.66%)	4(13.33%)	28.085	3	0.000
1 to20 (Mild Pain)	4(13.33%)	10(33.33%)			
21 to40 (Moderate Pain)	0	12(40%)			
41 to 60 (Severe pain)	3(10%)	4(13.33%)			
Visual analog scale at 8 weeks:					
0 no pain	24(80.0%)	4(13.33%)	30.403	4	0.000
1 to20 (Mild Pain	3(10.0%)	14(46.66%)			
21 to 40 (Moderate Pain)	0	6(20.0%)			
41 to 60 (Severe pain)	2(6.66%)	6(20.0%)			
61 to 80 (Very severe)	1 (3.33%)	0 0%			
Visual analog scale at 12weeks					
0 no pain	27(90.0%)	8(26.66%)	27.314	3	0.000
1 to20 (Mild Pain	0 .0%	13(43.33%)			
21 to 40 (Moderate Pain)	0 .0%	3(10.0%)			
41 to 60 (Severe pain)	3 (10.0%)	6 (20.0%)			

* p value is statistically highly significant calculated by Chi square test

(VAN. Group A 7.50+ 16.596, group B 26.333+ 17.564. P value. 0.001)
Eight weeks after injection, 80% of patients in group A and 13.33% in group B had no pain, 10% in group A and 46.66% in group B had mild pain, 0% in group A and 20% in group had moderate pain, 6.66% in group A and 20% in group B had severe pain , 3.33% in group A and 0% in group B had very severe pain.
(VAN group A. 6.33+16.863, group B 23.1667+17.834. P value 0.003)
Twelve weeks after injection, 90% in group A and 26.66% in group B had no pain, 0% in group A and 43.33% in group B had mild pain, 0% in group A and 10% in group B had moderate pain, and 10 % in group A and 20 % in group B had severe pain.
(VAN group A 5.33+16.344, group B 19.5000+19.08917. P value 0.010) (Table 3 &4).
The results in group A were, Good in 24,fair in 3 and poor in 3

TABLE NO.4 (n = 60).
Comparison of visual analog scale between group A and B.

Variable	Group A: (n = 30)	Group B: (n = 30)	t value	df	P value
Visual analog scale (baseline)	55.50+13.088	58.00+ 11.4921	-0.847	29	0.404
Visual analog scale (after 4 weeks)	7.50+ 16.596	26.333+ 17.564	- 3.664	29	0.001*
Visual analog scale (after 8 weeks)	6.33+16.863	23.1667+17.834	- 3.193	29	0.003*
Visual analog scale (after 12 weeks)	5.33+16.344	19.5000+19.08917	-2.752	29	0.010*

Results are presented as Mean + Standard Deviation
* p value is statistically highly significant calculated by student t test

patients. In group B the results were good in 4, fair in 4 and poor in 22 patients.

DISCUSSION:

The mean age of patients in our study was 48.26 years. The peak age reported in the literature is between 40 to 60 years.[14] We did not ask for radiographs of the foot. It has been reported that 50 percent of patients with plantar fasciitis have heel spurs, the detection is sometime an incidental finding and do not correspond with the patients symptoms. The radiographs can help rule out other causes of pain in the region.[15] Adverse events like increased pain and swelling after injection were seen in 13.33% of patients. The events lasted for 24 to 48 hours and then subsided without additional treatment. Corticosteroid injections are extensively used for the treatment of plantar fasciitis. This is the second most frequently described treatment for this condition in medical literature.[16]

The typical use of corticosteroid injection in musculoskeletal disorders is for suppression of prostaglandin mediated inflammation. Histological studies show that plantar fasciitis is a degenerative disorder, with very limited chronic inflammatory process.. It is also reported that In plantar fasciitis there is increased proliferation of fibroblasts along with secretion of proteoglycans. Corticosteroids also inhibit fibroblast proliferation and expression of ground substance protein This could explain the effectiveness of corticosteroid in this condition.[17 18]

Several studies have reported non specific evidence of local inflammatory change in plantar fasciitis.[19 20] Combining local anesthetic with corticosteroid for soft tissue injection, in a common practice. The reported benefits are brief period of pain relief, confirmation of proper site of injection, and dilution of acetate crystals.[21 22]

The patients included in this study were having symptoms for 12to 18 weeks and they have tried almost all the treatment options available except local steroid injection and surgery. we think that our decision of local steroid injection in these patients was justified.

At base line before injection all the patients had moderate to very severe pain. Four weeks after injection 76.66% of patients in group A had complete pain relief. This increased to 80% in eight and 90% of patients at 12 weeks time.On the other hand 13.33% of patients in group B had complete relief of pain at four weeks, the figure remained constant at eight weeks and increased to 26.66% at twelve weeks.

At the end of 12 weeks, only 26.66 % of patients in group B were pain free, 43.33% had mild and 10% had moderate and 20% of patients had severe pain. At the end of 12 weeks 90% of patients in group A and 26.66% in group B were pain free.The difference in result was significant. It was obvious that most of the patients receiving methylprednisolone got early and sustained relief in pain which was persistent for 12 weeks.

Crawford et al has reported the superiority of 25mg prednisolone mixed with lignocain over only lignocain injection in reducing pain one month after treatment, in patients with planter fasciitis.[23]

The only weakness in our study was that clinicians /researchers were not kept blinded from the type of steroid they were using. We think that in our case this has not affected the results.

CONCLUSION:

localmethylprednisolone injection is superior to local dexamethasone injection, in providing short term pain relief to the patients with planter fasciitis.

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