Efficacy of Steroids Injection for The Treatment of Plantar Fasciitis

Noman Shakeel Niazi[1], Suhail Niaz Khan Niazi[2], Khalid Niaz Khan Niazi[3], Madiha Iqbal[4]

ABSTRACT

Objective: To evaluated the effect of the steroid injection in the management of pain with plantar fasciitis patients.

Methods: This descriptive case series study enrolled 56 patients with symptomatic plantar fasciitis to treatment with SI, aged ≥18 years were selected from orthotics departments of HOPE Center, Pakistan from Mar 2013 to Dec 2013. All patients were assessed for patient history and pain relief at 1 and 6 months for pain relief after the initiation of steroid injection treatment.

Results: Out of 56 patients; 38(67.85%) were male & 18(32.14%) were female. The mean age and BMI of the patients was 37.76±13.35 years and 28.32±1.52.

Only 45/56(83.5%) got relieved after using treatment at one and six months follow–up, four patients became lost to follow up and five patients changed their initial treatment during the 6 month follow-up because did not experience relief. Results showed significant improvement in pain at four weeks was 42/51(82.35%) as compare to six month was 3/5(60.0%) , associated with lower compliance as ISE (2%), ISI (1%), and PFR (2.8%).

However, pain relief was showed significant difference after treatment at 4 weeks as (4.05±1.18) and insignificant at six month follow-up (3.94 ± 2.40).

Conclusion: Steroid infection is safe and effective method and provides short-term pain relief for patients with plantar fasciitis but for long term pain relief was insignificant and improvement was not sustained.

Key Words: Plantar fasciitis, Steroid Injection, Injection site infection.

INTRODUCTION

Plantar fasciitis (PF) is estimated to affect about 12 million people quality of life and work capacity in the world wide[1].

The risk of PF is 2.5% up to 10%,[2] with 83% of these patients being active working.[3] While among asymptomatic, it was found to be 4% to 22%.[4] Incidence is approximately 11-15% at the age > 40 years.[5] There are various treatment modalities for PF , most cases of plantar fascia can be successfully managed with a conservative approach. Surgery should be considered only after failure of the conservative treatment[6].

About 75% several interventions are used SI for the management of PF, despite the widespread use of steroid injection for PF no current standard of care and the existing management protocols are mainly from expert opinion-derived practice guidelines[7]. The steroid injections are the most widely accepted approach. The use of steroid injections remains controversial as it has no clear improved outcome over other conservative treatments and importantly, significant possible underappreciated side effects, despite the widespread use of steroid injections in the region to treat the condition. As per available resources, there is no local data available therefore this study will be a good addition in the relevant medical literature.

Therefore, this study aims to compare the efficacy of steroids injection on the assessment of pain relief for the treatment of plantar fasciitis to understand its acceptability and low risk in cases of plantar fasciitis, so that a decision can be made regarding the implementation of this technique at a wide scale in our population.

METHODOLOGY

This descriptive case series study included 56 consecutive patients after approved from hospital ethical committee who underwent conservative treatment, both male and female, aged >15 years were selected from Orthotics department of HOPE

Senior Registrar, Lahore General Hospital, Lahore
Corresponding Author: Noman Shakeel Niazi
Email: nomanniazi@gmail.com

Rehabilitation Center in Lahore, Pakistan from 1st March 2013 to 31st December 2013.

Patients were fulfilling the criteria of diagnosis of plantar fasciitis according to the guidelines of the American College of Foot and Ankle Surgeons (ACFAS) heel pain committee[8] as (medical record and who experiencing significant history of planter heel pain with symptomatic duration of at least 2 month i.e. initiated by weight bearing, pain provoked by the first few steps in morning by standing after prolonged sitting and tenderness localized to the origin of the plantar fasciitis on the medical calcaneal tubercle) and elicited by dorsiflexion and palpation of the inferior heel were considered to have PF were included. The exclusion criteria was the cases with previous foot surgery, previous injection, foot trauma, tarsal tunnel syndrome and other medical causes with generalized inflammatory disorder like gout, ankylosing spondylitis, rheumatoid arthritis or lupus.

After examining the patient by a doctor, an informed consent was obtained from each patient. Demographic history was noted for each patient by interview and gender, age and BMI were noted. The patients were assessed for the outcome parameter i.e. pain relief. [9,10] The area was cleaned by antiseptic and single injection of 40mg (1ml) of methylprednisolone (Depomedrol) and 2 ml of 0.5% bupivacaine into the tender most area of inflamed plantar fascia by palpation. The patients were sent home same day and were given paracetamil 500mg(QID) and Naproxen (BD) 500 mg BD for one week.

Nest visit was after 4 weeks and six months following SI treatment and asked about pain using the visual analog scale (VAS) between 0 and 10 points, in which 0 represented no pain and 10 represented the worst pain experienced by the patients [11, 12]. Pain intensity was measured before treatment, 4 weeks and six months after the initiation of the treatment and any adverse reaction assessed by MR image abnormalities i.e. repture (increased PF thickness up to 10mm with convexed dorsal thickening), ISE as nodosum b/w 2- 6 cm,[28] were recorded. Information was collected on Performa.

The data will be entered and analyzed using SPSS 21.0. Mean ± S.D will be given for quantitative variable. Frequencies and percentages will be given for qualitative variables. Paired sample t tests will be applied to observe pre and post mean differences of quantitative variables. A p-value of ≤ 0.05 will be considered statistically significant.

RESULTS

Out of 56 patients of which 38(67.85%) were male while 18(32.14%) were female. The mean age of the patients was 37.76±13.35years and the average of BMI was 28.32±1.52 as shown in table I.

Post operative mean VAS pain improved (4.05±1.18 at one month and 3.94 ± 2.40 at 6 month) and is associated with lower complications of heel pain.

Three patients were lost to follow-up while two patients changed their initial treatment at one month, out of 51 cases 42 patients had pain relieved after using treatment and nine patients were remained painful after using steroid injection treatment.

Table 1: Patient Characteristics

Variables		**Treatment (Steroid injection) (n=56)**
Gender	Male	38(67.85%)
	Female	18(32.14%)
Age		37.76±13.35
BMI		28.32±1.52

Table 2: 4th week and 6th month after effect of steroid injection for the assessments of pain relief using (VAS) pain score on plantar fasciitis patients.

Treatment	**(VAS) pain score**
Baseline	7.33 ± 2.09
After 1st month follow-up	4.05±1.18*
After 6th month follow-up	3.94 ± 2.40

*: statistically significant as P-value < 0.05

Table 3: 4th week and 6th month after effect of steroid injection for the assessments of pain relief on plantar fasciitis patients.

Treatment (Steriod injection)		**Frequency (%)**
After 1st month follow-up	Yes	42/51(82.35%)
	no	9/51(39.13%)
After 6th month follow-up	Yes	3/5(60.0%)
	no	2/5(40.0%)
Total		45/56(83.5%)

Out of nine patients who remained painful after using steroid injection at one month, one patient became lost to follow-up and three patients changed their initial treatment during the six month follow-up.

Out of five cases three patients had pain relieved and two patients were remained painful after using steroid injection treatment at six month follow-up while the difference was statistically significant as p-value > 0.05.

DISCUSSION

The present study provides evidence that the SI is effective option that focuses on decreasing pain for PF patients, associated with lower complications of heel pain as injection site erythema (2%), injection site infection (1%), and Plantar fascia rupture (2.8%). With time and a good conservative treatment plan, approximately 83.5% of patients resolved their condition or reach a tolerance level where it does not have much effect on their lifestyle as it showed significant improvement in pain at 4 week while insignificant at six month follow-up. Pain relief was maximum at 4 weeks and pain came back in some patients at 6 months period.

Our results were comparable with the previous literature by Chaitali B et al (2015) found that SI is a better treatment modality as it causes early, rapid and sustained relief of pain and inflammation in plantar fasciitis as 54/60(90%) and the mean VAS score improved (1.09±1.16 at one month and 1.92±1.22 at 2 month) also found low in-hospital outcome (16.66%). Present results showed similar results.[13]

Wolgin M et al initiated greater pain reduction with the SI alone at one month as (84%). [14]

Scherer PR et al (1988) showed that 84% of the patients treated SI had at least 80% relief of symptoms and 7% had no relief at one month.[15]

Lee TG et al (2007) reported that SI is more superior in terms of speed and probably extent of improvement in pain relief as (90.3%) while 3(9.7%) had not reduction in pain levels and significantly lower VAS pain score at 3 (2.3±2.6;P-vlaue= 0.001) and 6 month (2.4±3.0; P-value =0.094). [16]

Yucel U et al established significant improvement in pain relief additionally, pain score was more improve at 1 month as (3.70 ± 1.45) also found statistically significant difference in mean pain score before and after treatment of both groups (P-value <0.05). Present study showed similar results[17].

Shuming Li et al (2014) found that SI was less effective long term treatment showed a significant effect of mean VAS pain relief at the 1-month as (4.03 ± 2.37) but not at 6 months as (6.32 ± 2.64). Present study showed similar results[18].

Kalaci A (2009) illustrated that SI showed a significant effect of mean VAS pain relief at the 1-month as 3.04±2.32 and 1.52±2.14 at 6 month and found no side effects [19].

Gerald TK et al (2011) examined that the SI group had the second highest number of patients who improved after treatment with (72%). There were 7% of patients who got complete pain relief after injection, only 5% had no pain relief at 2 weeks[20].

Kulkarni RS et al (2004) found only (79.83%) got complete pain relief after injection, (18.54%) had slight pain while (1.61%) had remained painful at six month, due to small sample size present study showed different results[21].

Abdihakin M et al (2012) scrutinized that SI showed fewer improvement in pain relief in PF at one month (53%, mean pain VAS 5.2±1.7) and at 2 months (45%, mean difference 4.9±1.7) [22].

Black AJ et al (1996) recognized that local injection significantly improved pain at 1 month (30.76%, mean VAS pain score 6.23±1.4) .The difference in pain was reported as non-significant at 6 month. As the pain was commonly one sided and no cause was found in majority of the patients due to this study showed dissimilar results[23].

Crawford et al (1999) demonstrated that SI can provide short-term relief but not subsequently as significant reduction in pain levels after receiving SI at 1 month as (2.9±2.5); however, after 3 months there was observed no significant difference as (2.4±2.6), found no complication. Due to local anaesthetic was also given to the patients who received steroid injection in that study that's way present study showed dissimilar results[24].

However, study by Brinks A et al (2010) established that SI has been implicated in adverse reactions including one death from necrotizing fasciitis, injection site cellulitis, atrophy of the fat pad, and tendon rupture[25].

Kim, et al (2010) reported on a 2.4% incidence of plantar fascial rupture after receiving an average of 2.67 injections[26].

Chaitali B et al (2015) found injection site erythema (10%), injection site infection (3.3%), plantar fascia rupture (3.3%)[13]. Present study demonstrated similar incidence of PFR (2.8%) and ISI rate 1% while ISE 2% was found to be less in present study due to improve injection target and monitor soft tissue changes, thus preventing complication.

Gerald TK et al (2011) reported no cases of severe complications from SI injections [20]. Acevedo JI et al (1998) were noted post op complications for PF including rupture approximately 10% of subjects, two-thirds of the patients developed sudden onset rupture while one-third have acute onset[27]. Sellman JR[28] et al reported 50% in additional Daly PJ et al reported 57% rupture rate.[29] present study showed dissimilar results due to overuse of steroid injection so that cause the higher rate of post operative complication. As the SI was not given according to the US guidance; however the overuse of steroid injection increases the incidence of post operative complication in these studies so, present study showed contradictory results. A further study reported no complication associated with the steroid injection.[30]

Savas G et al (2013) examined that after SI treatment pain relief was improved after 6 month follow-up as 18(60%), acceptable in 7 (23.3%), and poor in 5 (16.7%) and mean VAS score improves at 6 month was (2.97±2.41) while, no complication attributable to corticosteroid injections was observed. Present study demonstrated also 60 pain relief at 6 month. [31]

CONCLUSION

Steroid injection is safe and effective treatment for short term pain relief in patients treated with plantar fasciitis while after long term showed less improvement in pain relief. In many literatures steroid injection was not assessed alone. It is very difficult to assess the effectiveness of each individual treatment. We also could not figure out whether the steroid injection was more effective for patient whose BMI > 30.

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