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Efficacy of Methylprednisolone Acetate Injection for the Treatment of Plantar Heel Pain

S. Abdolhossein Mehdi-Nasab,*[1] Nasser Sarrafan,[1] Hamid Reza Arti,[1] Mohsen Khorami,[1] Gholamhossein Rafatian[1]

1. Department of Orthopaedic, Musculoskeletal and Rehabilitation Research Centre, Jundishapur University of Medical Sciences, Ahvaz, Iran

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Abstract

***Background*:** To assess the short term results of local methyl prednisolone acetate injection for the treatment of heel pain syndrome.
***Materials and Methods*:** This prospective study was carried out on 109 patients with plantar heel pain who were treated by local methyl prednisolone acetate injection. Reduction of pain and tenderness were the primary measurement outcome.
***Results*:** Rest pain, walking pain and tenderness at 3 weeks was relived in 70 and 67 and 74 patients, and after 3 months in 72, 68 and 81 patients respectively. Mean patient's pain score was 8.2±2.2 before injection, 4.1±1.5 at 3 weeks, and 3.9±1.4 at 3 months after injection.
***Conclusion*:** Local injection of methyl prednisolone acetate was associated with a fairly high satisfactory short term results in the treatment of heel pain.

Introduction

Plantar heel pain is one of the most common musculoskeletal disorders which can affect many adults and active people and reduce their useful working abilities [1, 2]. Although the exact cause of heel pain is unknown, inflammatory and biomechanical factors are thought to be involved in this condition [3-5]. Some other involved factors are tension or pressure on plantar fascia, obesity and sudden weight gain, wearing improper shoes, long standing and flat feet [6]. Like the other musculoskeletal disorders, local injection of corticosteroid is a common method for the treatment of heel pain, especially in patients who cannot tolerate analgesic drugs due to gastrointestinal upsets. This mode of treatment is used frequently by rheumatologist and orthopedist for treatment of heel pain. In some studies, results of local steroid injection have been reported to be comparable with long-term prescription of heel pad orthosis, though rupture of plantar fascia has been reported as a rare complication of this treatment [7, 8].

In a study by Crawford et al., the short term corticosteroid injection led to reduced pain [9]. Acevedo and Beskin have considered the rupture of plantar fascia and injection pain as side effects of this therapy [10]. The present study aimed to assess the efficacy of the local methyl prednisolone acetate injection in this disease.

Materials and Methods

This prospective cross sectional study was conducted on patients with plantar heel pain who referred to orthopaedic clinics of Razi and Imam Khomeini hospitals in Ahvaz Iran, from October 2008 to March 2011. Inclusion criteria: unilateral heel pain for at least 3 weeks, age range of 20-70 years old, no previous heel injection, no history of rheumatic disease, and no traumatic injury. Exclusion criteria: heel pain duration less than 3 weeks, patients who did not take part in follow up. Anteroposterior, lateral and axial view radiographs of heel and ankle were taken for all patients. After patient selection, one ml lidocaine 2% was injected using syringe insulin, and then one Depo-Medrol® vial (40 mg Methylprednisolone acetate) (Hormone company, Iran) was injected by a fine needle No. 21 or 23. Among of 133 patients who were treated, 24 patients were excluded because non compliance in follow up. As a result, the remaining 109 patients were included. Ten centimeter visual analogue scale (VAS) was used to assess the severity of the pain before and after treatment.

The patients were asked to fill out a check list composed of 3 questions for evaluation of pain during rest, standing or walking and plantar heel tenderness. Data were entered and analyzed by using the statistical software SPSS-13. $p<0.05$ was considered significant. This study was approved by Ethic committee at our university and a consent form was taken from the patients.

Results

In this study, 109 patients were included among which, 81 (74.3%) were women and 28 (25.7%) were men. Sixty eight patients (62.4%) were complaining of the left and 41 patients (37.6%) from the right heel. Mean age of the patients was 45.9 years (range 26 to 65 years). Anteroposterior and lateral radiographs of the heel and ankle was taken for all subjects. Calcaneal spur in 1-2 millimeters size was seen in 41 (37.6%) patients. The age

group of ≤ 30 years had the lowest frequency (7.4%) and the age group 41-50 years had the highest frequency (33%). The most frequent job (56%) was housekeeping for women.

Table 1 shows the frequency distribution of pain before, three weeks after and three months after injection. It can be seen that 77 patients (70.6%) complained of moderate to severe rest pain before injection while after 3 months, 22 (20.2%) of the patients complained of this pain. Results are shown in Table 1 and 2. At three weeks and three months after injection, 61.4% and 62.4% of patients did not complain of pain during standing or usual activities respectively. Tenderness before injection was present in 81% of the patients. This symptom at 3 weeks and 3 months after injection was relived in 67.9% and 69.7% of the subjects respectively (0.044). The most common, adverse reaction was the experience of pain feeling during injection in 89% of the patients. This reaction was transient and all patients were able to walk after a few minutes. No cases of severe reaction or local infection were occurred. Mean patients pain score (VAS) before injection was 8.1±2.3, that was reduced to 3.6±1.7 at 3weeks and 3.4±2.2 at 3 months after injection. No statistical differences in pain score were observed between 3 weeks and 3 months after methylprednisolone injection, but significant improvement was seen after 3 weeks and 3 months versus pre treatment, table 2 shows a relationship between patients age and reduction in pain score and those patients who were younger than 50 years age obtained more pain reduction, though statistically it was not significant.

Discussion

In this study, the age group of ≤ 30 years had the lowest frequency (7.4%) and the age group 41-50 years had the highest frequency (33%). The most frequent job (56%) was housekeeping for women. We observed that most of the patients were pain free at 3 months after local steroid injection, that is in favored of short term results of this treatment. Our findings suggest that no significant difference was observed between the results at 3 weeks and 3 months after steroid injection.

There are a variety of modality treatments for heel pain syndrome including reduction of prolong standing or walking, nonsteroidal anti-inflammatory drugs, the use of heel pad with appropriate foam, shoe inserts, sandal, local injection of corticosteroids, physiotherapy, ultrasound, extra corporal shock wave therapy, and rarely surgery 11-13. Each of these treatments has their own advantages and limitations. The mean age of our patients was 45.9 years which is comparable with literature [11-13].

Crawford et al. studied effect of local injection of prednisolone acetate in 106 patients with heel pain and reported good results in a 6-month follow-up. They found that prior local anesthesia did not increase the patient comfort [9]. In another study, Miller et al. reviewed the results of local injection of betamethasone (6 mg) in 27 patients with heel pain in a 5-8 months period and concluded that steroid injection can be considered as an effective method but they believed it will not likely result in permanent remission [14].

In a study by Vaziri et al. the efficacy of inside-heel wedge orthosis was assessed for heel pain syndrome. In their study on 50 patients, (64% female and 36% male) pain was relieved in 74% of the subjects [15]. It may represent a likely risk factor or certain risk factors associated with female sex in our environment. As shown in the study, the majority of the patients (74.3%) were women, and most of them were (56%) housekeeping. Although it was expected that some occupations seemed to have similar risk factors (like hairdressers with long-standing) among the subjects, the qualified people in this class did not come to our clinic. Of course, to determine the relationship between occupation and heel pain, a separate study is required.

It should be noted that this study was done on patients who voluntarily referred to the clinic and the related jobs were collected in a random manner and no selection was made in this regard. In our study, 62.4% of patients had left heel pain, but no result was found in other studies reviewed in this regard. We observed that the majority of the patients were those who had severe heel pain during standing or walking. This is in favor that mechanical pressure on heel can be a contributing factor in heel pain. We found that 64.2% after three weeks and 66% after three months did not complained of pain at all. This means that the maximum effect of steroid injection can be expected to occur after 3 weeks. In this study, it was found that the higher the age of patients, the lower will be their satisfaction of this therapy.

Table 1. Results of treatment

Parameter		Before injection N (%)	After 3 weeks N (%)	After 3 months N (%)	*p*-Value
Rest pain	Mild	32 (29.3)	16(14.6)	15(13.7)	0.045
	Moderate	35 (32.2)	13(11.9)	12(11)	0.067
	Severe	42 (38.5)	10(9.3)	10(9.3)	0.041
	No pain	0	70(64.2)	72(66)	0.03
Pain on standing or walking	Mild	22(20.1)	11(10.1)	14(12.8)	0.044
	Moderate	36(33)	14(12.9)	12(11)	0.065
	Severe	51(44.8)	17(15.6)	15(13.7)	0.035
	No pain	0	67(61.4)	68(62.5)	0.03
	Tenderness (+)	89(81.6)	35(32.1)	28(25.7)	0.621
	Total of patients	109	109	109	

Table 2. Patients pain score according to the age group

Age group	Before injection (Mean±SD)	After 3 weeks (Mean±SD)	After 3 Months (Mean±SD)	*p*-Value
≤ 50 years	7.8 ± 2.3	3.9 ± 2.5	3.7 ± 1.9	0.45
> 50 years	8.7 ± 1.1	4.5 ± 2.1	4.3 ± 1.3	0.31
All patients	8.2 ± 2.2	4.1 ± 1.5	3.9 ± 1.4	0.42

Data are given as mean ± standard deviation. VAS: (mild=1-3), (moderate= 4-7), (severe= 8-10). *p*-Value refers before MP injection and after 3 months

The patients' satisfaction with the treatment did not show a significant difference in women and men, and also, tenderness and activity improvement had no significant difference in both sexes after treatment. The study showed that the higher the age of patients, the lower will be the pain reduction and lower satisfaction rate with this therapy. Despite of lidocaine injection for local anesthesia before methylprednisolone injection, a noteworthy point was the feeling of pain caused by needle during injection. This was an unpleasant experience for the patients, so we recommend using a fine needle to minimize or eliminate this adverse reaction.

We observed that there was no relationship between age and this reaction, but women experienced more pain. With regard the duration of symptoms before treatment, the research showed that the more chronic the disease, the lower will be the effectiveness of this treatment. A limitation of our study was outcome measurement in a short term follow up. Also variables such as body mass index or occupation can alter the response of treatment or affect the course of disease that future studies will be needed.

In conclusion, a single local injection of steroids (methylprednisolone) was associated with a fairly high satisfactory short term results in the treatment of heel pain syndrome. This method of treatment was less effective in patients who had a more chronic symptom or were in older age. To determine the role of occupation, further study will be needed.

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Authors' Contributions

SA Mehdi-Nasab, writing and editing the manuscript. Rafatian G, designed the study, Sarrafan N, Arti HR, Khorami M performed the procedure and collected the data. The authors did review and final approval of manuscript.

Conflict of Interest

The authors declare no conflict of interest.

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Ahvaz Jundishapur University of Medical Sciences.

*Corresponding author at:
Department of Orthopaedic, Musculoskeletal and Rehabilitation Research Centre, Azadegan Street, Emam Khomeini Hospital, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
E-mail: hmehdinasab@yahoo.com

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