

Research Article

Plantar Fasciitis Treatment; Efficacy of Extracorporeal Shock Wave Therapy

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Abstract

Efficacy of extracorporeal shock wave therapy (ESWT) in the treatment of plantar fasciitis (PF) is under debate in spite of applying in treatment. We aimed to investigate the efficacy of extracorporeal shock wave therapy in decreasing plantar fasciitis heel pain.

Methods: Eighty patients fulfilled the inclusion criteria; 77 agreed to participate the study. Patients randomly divided into 2 groups of treating with NSAID alone and NSAID+ESWT and assessed in to periods of 4 and 8 weeks with a focus on ESWT effectiveness.

Results: Visual analog score decreased significantly after eight weeks of treatment with ESWT+NSAID in comparison with NSAID group alone. ($p < 0.05$)

Conclusion: ESWT reduced pain of PF in our study. So it could be used as treatment options.

INTRODUCTION

Plantar fasciitis (PF) is one of the most common causes of heel pain in adults, while its etiology is not clear. Although some risk factors have been suggested including those conditions that increase the pressure at the sole such as prolonged standing position, obesity, flat foot, and repetitive trauma to the sole [1-4].

The diagnosis of plantar fasciitis is based on plantar point tenderness as the hallmark and morning sole pain gradually relieving with walking [5] However, radiographic studies are required to rule out other conditions. Ultrasonography of the foot is also useful in diagnosis and follow-ups demonstrating thickening of plantar fascia, decreased echogenicity at the insertion of plantar fascia upon the calcaneus, and features of edema between the fascia and surrounding tissues [5,6].

The treatment options for relieving PF symptoms include activity modification, plantar fascia stretching, ice massage, night splints, non-steroidal anti-inflammatory drugs, local steroid injections, extracorporeal shockwave therapy, and surgery [3].

Extracorporeal shock wave therapy (ESWT) has been widely

used as a suitable treatment option for musculoskeletal disorders such as tendinopathies and bone healing disturbances [16]. In addition it has been used for plantar fasciitis treatment due to its convenience, noninvasive nature and fast recovery time [5,6]. The specific mechanisms of ESWT in treating musculoskeletal pain is not clear; multiple studies have reported that it can destroy sensory unmyelinated nerve fibers, and stimulate neovascularization and collagen synthesis in degenerative tissues [3,7,8].

In this study we conducted a randomized trial to evaluate the efficacy of ESWT in the management of plantar fasciitis.

METHODS

This randomized clinical trial was registered in the research and ethics committee of Ardabil University of medical sciences. Inclusion criteria included at least three months heel pain compatible with PF pattern without any history of diabetes, rheumatologic disease, arthritis, neurological abnormalities, recent trauma or foot surgery, infectious diseases, and malignancy. Based on the criteria, 80 patients entered the study and grouped in 2 clusters; first group received NSAID (Naproxen

tablet 500 mg every 12 hr) as well as 5 sessions shockwave therapy and second group received Naproxen only as mentioned. In the meantime, conservative managements including stretching exercises were applied for both groups.

Shockwave intervention was carried out for 5 sessions with a 72-hours interval by the same operator using a 12 MHz linear array transducer. For each session a pressure of 2 bars with 2000 shockwaves were applied.

Self report pain score (Visual Analog Score) was recorded before the study and at 4th and 8th weeks after treatment.

Statistical analysis

Data were analyzed with SPSS software for windows, version 16.0 (SPSS Inc., Chicago IL, and USA). A paired samples t-test, independent t-test and ANOVAs were applied for the analysis. A result was considered to be statistically significant with (P value<0.05.)

RESULTS

Two patients from first group and 1 patient from second group refused to continue the study. Seventy-seven patients including 41 females and 36 males suffering plantar fasciitis agreed to participate the study (Figure 1). Mean age of participants was 49.51 years and mean body mass index was 26.82. Demographic characteristics of the both groups are outlined in Table 1. There was no significant difference between the two groups in terms of baseline characteristics. Pain improvement was seen in both groups but with significance in ESWT group especially after eight weeks, as shown in detail in table 2.

DISCUSSION

Multiple treatment options has been proposed for plantar fasciitis, including activity modification, stretching plantar fascia, ice massage, night splints, nonsteroidal anti-inflammatory drugs combined with other treatment modalities, local steroid injections, extracorporeal shockwave therapy, and surgery [3]. Effectiveness of some of them especially ESWT are not clearly described. Recently the use of ESWT approved by the FDA for treatment of plantar fasciitis in the USA [9]. The current study conducted for evaluating the efficacy of the ESWT in Iran.

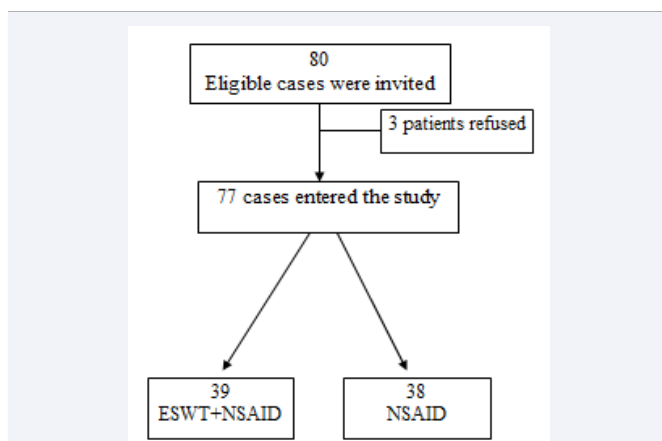


Figure 1 Shows study diagram.

Table 1: Demographic characteristics of the case and control groups.

P value	NSAID	ESWT+NSAID	
0.4	50.95±9.86	48.07±10.74	age
0.5	19/20	22/16	Sex (F/M)
0.52	26.8/26.9	27.1/26	Body Mass Index (F/M)

Table 2: Pain improvement in both groups based on average VAS.

P value	After 8 weeks	After 4 weeks	Before treatment	
0.01	3.2	3.69	7.37	ESWT+NSAID
	3.65	4.37	7.2	NSAID

Haake et al. previously reported better improvement in the ESWT treatment than the placebo group [7].

In another study, Rompe et al. indicated stretching exercise and low energy shock wave therapy together improved patients' symptoms more in comparison with the stretching alone [10]. Some other studies reported mostly effectiveness of ESWT in pain subsidence of heel pain and plantar fasciitis in spite of different significances [11-15].

On the other hand, Speed et al. reported no beneficial effects for shock wave therapy for PF [8].

These different results for the efficacy of ESWT in plantar fasciitis may be due to multiple factors ,like study populations, heterogeneity of treatment parameters such as shock wave intensity, geometry of the shock wave focus, focal energy, different placebos and patients' self treatments.

In our population study in Iranian northwest, use of ESWT after 4 and 8weeks resulted in significant symptom relief and patients' satisfaction in comparison with the use of NSAID only.

CONCLUSION

So that is clinically recommended that applying ESWT would be helpful for patients suffering PF.

Further studies, especially in Iranian population, are also proposed with larger study groups to better investigate the efficacy of the treatment.

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