

Special Article

Impact of chronic plantar fasciitis on work-related activity: a literature review

Eduardo Araújo Pires¹ , Carmen Silvia Molleis Galego Miziara² , Rafael Barban Sposeto^{1,3} , Fabio Correa Fonseca¹ , Alexandre Leme Godoy-Santos^{1,3} , Túlio Diniz Fernandes^{1,3} 

1. Instituto de Ortopedia e Traumatologia, Hospital das Clínicas, Faculdade de Medicina, Universidade de São Paulo, SP, Brazil.

2. Departamento de Medicina Legal, Ética Médica e Medicina Social e do Trabalho, Hospital das Clínicas, Faculdade de Medicina, Universidade de São Paulo, SP, Brazil.

3. Lab. Prof. Manlio Mario Marco Napoli, Instituto de Ortopedia e Traumatologia, Hospital das Clínicas, Faculdade de Medicina, Universidade de São Paulo, SP, Brazil.

Abstract

Objective: Compare the real need for rest of chronic plantar fasciitis patients with the leave of absence time and criteria used by national and international technical medical expert examination manuals.

Methods: We conducted a review of the medical literature from 2013 to 2018, selecting only randomized controlled clinical trials on the treatment of chronic plantar fasciitis. National and international medical expert examination manuals were also selected. The treatment time for chronic plantar fasciitis was then compared with the leave of absence time recommended by the manuals.

Results: Of the six articles selected, we ascertained that three articles evaluating second-line treatment managed to reduce the VAS by 60% after 4 weeks, one after 3 months, one after 6 months, and one that showed no improvement at all. In all studies, no control group receiving first-line treatment alone achieved a 60% reduction in the VAS during the follow-up period. The evaluated manuals recommend leave from work ranging from zero to 21 days, with only two using the criterion of the type of work performed by the employee for the expert decision.

Conclusion: We observed that none of the medical expert examination manuals provides support for the medical expert to grant leave to workers with chronic plantar fasciitis from their work-related activities to receive secondary treatment for at least four weeks. In addition, stratification by acute or chronic disease is not observed. Two manuals scale leave time by type of activity.

Level of Evidence III; Economic and Decision Analyses; Analyses Based on Limited Costs and Alternatives.

Keywords: Fasciitis, plantar; Occupational diseases; Social security.

Introduction

Pain in the area of the heel is one of the main reasons workers seek appointments with orthopedists in emergency rooms and outpatient clinics. Among the various diseases related to this symptom, such as Achilles tendinopathy, tarsal tunnel syndrome and plantar fascia ruptures, the most common is plantar fasciitis^(1,2).

Plantar fasciitis is defined as an inflammatory and degenerative disorder located in the proximal region of the central

band of the plantar fascia^(1,3,4). Studies deduce that it affects approximately one million Americans every year, accounting for 1% of all orthopedic appointments in the United States (US), at an annual cost of 192 to 376 million dollars⁽²⁻⁶⁾.

Of as yet unknown etiology, plantar fasciitis is believed to be multifactorial, and is more common in elite runners and workers who spend long periods standing, such as guards, nurses and postmen. The main risk factors are being female and/or aged between 40 and 60, limitation of ankle dorsiflexion and obesity^(1,3,7,8).

Study performed at the Lab. Prof. Manlio Mario Marco Napoli, Instituto de Ortopedia e Traumatologia, Hospital das Clínicas, Faculdade de Medicina, Universidade de São Paulo, SP, Brazil.

Correspondence: Eduardo Araújo Pires. 185 Americanos St., Barra Funda, São Paulo, SP, Brazil, Zip Code: 01139-010. **E-mail:** dreduardoaraujopires@gmail.com
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The diagnosis is usually clinical, with typical symptoms being pain in the plantar region of the heel, which is more intense in the morning when starting to walk and improves when starting a particular activity, such as walking^(9,10). First-line conservative treatment is based on rest, cryotherapy, insoles, non-steroidal anti-inflammatory drugs (NSAIDs), stretching exercises, myofascial releases, and others^(7,11-13).

This treatment is satisfactory in 90% of people diagnosed with plantar fasciitis⁽¹⁴⁾. However, the rest of those undergoing first-line conservative treatment who progress with little or no improvement after two months, are diagnosed with chronic plantar fasciitis⁽¹⁵⁾. Among other reasons, this fact is associated with the delay in treatment initiation, obesity, and bilateral foot involvement⁽¹⁶⁾.

In this phase, the recommended treatment is the maintenance of analgesics, insoles, more suitable shoes and stretching exercises combined with second-line treatment, such as infiltrations, shockwave therapy, needling, low-level laser therapy, ultrasound, and others^(14,17-20).

Patients refractory to conservative treatment for more than six months may require surgical treatment, such as plantar fascia release or gastrocnemius lengthening⁽²¹⁻²³⁾.

Company employees who remain standing for long periods of time during their workday often develop chronic plantar fasciitis, since they are generally people with restricted access to health services who wear inappropriate shoes at work. Because chronic plantar fasciitis causes pain that is hard to manage, with a detrimental effect on the employee's work activity, this fasciopathy generates a high rate of absenteeism⁽²⁴⁾.

Temporary leave of absence is requested in order to improve a worker's quality of life and provide them with more effective treatment. However, disability allowance is often denied⁽²⁵⁾.

According to Brazilian legislation, once the grace period has elapsed, all employees who pay social security contributions to the National Institute of Social Security (INSS) and are up to date with their payments are entitled to disability allowance/sick pay for the treatment of their medical conditions, subject to proof from the medical expert of the INSS unit responsible for their case.

As the risk factors for plantar fasciitis are not well known and the condition requires long-term treatment, INSS experts do not usually classify the individual with plantar fasciitis who is undergoing the examination as unable to work. This prompts the employee to resume his duties, with reduced work capacity.

With the intention of providing experts with guidance on the necessary treatment time for a wide variety of medical conditions, i.e., duration of leave of absence from work of a particular individual undergoing examination, governments of several countries draw up technical manuals for experts at their social security entities.

The purpose of this study is to evaluate the duration of chronic plantar fasciitis treatment instituted by the various means described in the orthopedic literature, and to compare them with the technical manuals of social security experts.

Methods

This is a literature review study where we will be analyzing information about time to improvement of pain in the treatment of chronic plantar fasciitis.

Therefore we used the Pubmed database, and carried out the advanced search according to the descriptor (MESH) *fasciitis, plantar*. After this first selection, we used the advanced search tool of the Pubmed platform to select only randomized controlled clinical trials published in the last five years. These articles were evaluated individually, excluding those that did not fulfill the inclusion and exclusion criteria.

As inclusion criteria, we chose only randomized controlled clinical trials, with publication date in the last five years (2013 to 2018), follow-up time greater than or equal to three months, in patients with a clinical diagnosis of chronic plantar fasciitis, such as pain in the plantar region of the calcaneus, in which the pain starts in greater intensity when the patient stops resting and stands upright, progressing with partial improvement after walking. As criteria for the term chronic plantar fasciitis, we used patients refractory to first-line conservative treatment, such as analgesics, anti-inflammatory drugs, insoles and stretching exercises for at least eight weeks.

As exclusion criteria, we excluded retrospective, cross-sectional and observational articles and pilot studies. Non-randomized uncontrolled articles and articles with patients undergoing surgical treatment were not accepted either.

In those studies that met the inclusion and exclusion criteria, we collected information such as: sample size, disease duration, type of randomization, follow-up time and time to improvement of pain in the intervention and control group. As a parameter of time to improvement of pain, we decided to use the target of the time needed to reduce the initial Visual Analog Scale (VAS) score by 60%⁽²⁶⁻²⁸⁾.

A search for national and international technical medical expert examination manuals was carried out simultaneously. These manuals contain suggestions on the average time of disability/sick leave, helping experts decide on the time needed to treat a particular condition in the person under examination.

Those data were compared with national and international technical medical expert examination manuals in order to correlate the time needed to treat the chronic plantar fasciitis patient to the leave of absence time recommended by the current manuals.

Results

We accessed the Pubmed database, performed an advanced search based on the descriptor (MESH) *fasciitis, plantar*, and found 728 articles which, after being filtered through the advanced options of the research platform, were narrowed down to randomized controlled trials published in the last 5 years (2013-2018), totaling 56 articles.

After this process, the 56 articles were analyzed individually. Of these, six fulfilled the inclusion and exclusion criteria. These

articles record 536 feet diagnosed with chronic plantar fasciitis. The follow-up time was three months to two years.

As an add-on therapy to first-line treatment, the studies used shockwave therapy, infiltrations with corticosteroids, platelet-rich plasma (PRP), polydeoxyribonucleotide (PDRN) or autologous conditioned plasma in the topography of the calcaneal insertion of the plantar fascia.

Among the manuals used to assess leave of absence time, we used the following: Manual de Procedimento de Perícias Médicas (UNESP - BRAZIL), Disability Duration Guidelines (WCB - US), Return to Work & Disability Duration Guideline (US) and Tiempos Estándar de Incapacidad Temporal (INSS - SPAIN).

Discussion

Plantar fasciitis is the most common cause of heel pain in adults, leading to reduced work capacity of employees worldwide⁽²⁹⁾, and is responsible for 10-15% of foot-related symptoms⁽¹⁴⁾. The increase in sedentary habits in the global population, associated with weight gain and aging, may contribute to an increase in the prevalence of plantar fasciitis, since obesity and age between 40 and 60 years are known risk factors⁽⁹⁾. In addition, many occupations require workers to remain standing for long periods, thus adding risk factors for the development of plantar fasciitis.

It is widely known that the conservative treatment of plantar fasciitis is satisfactory in most cases⁽³⁰⁾, yet a small portion of these progress to chronic plantar fasciitis. The rehabilitation of these patients is often difficult, as pain generates dissatisfaction and changes in medical staff in search of other therapies. There is also an increase in the cost of treatment

due to the need to perform more expensive procedures, such as shockwave therapy, infiltrations, laser treatments, and others. The number of work absences rises as a result of this problem.

Although studies claim that plantar fasciitis is a self-limiting condition that resolves without intervention in approximately one year, some people remain symptomatic for longer. Ibrahim et al.⁽²³⁾, in a prospective, randomized, placebo-controlled study, monitored 47 patients with chronic plantar fasciitis, diagnosed at least six months previously and refractory to first-line conservative treatment, for two years. Persistent pain was observed in their control group, with an average score of 5.6 points on the VAS scale at the end of their work. The other articles analyzed in this study, despite having a shorter follow-up time, show similar data^(16,28,31-33). This shows the relevance of plantar fasciitis in a worker's life, making it difficult for them carry out their work activities, especially those workers who need to remain standing for long hours during their workday.

The therapeutic approach to chronic plantar fasciitis is based on maintaining first-line treatment in combination with more invasive procedures. A multicenter therapeutic study followed up 146 patients with this condition for three months, during which time half of the sample underwent shockwave therapy and the rest of the participants received placebo treatment. A statistically significant reduction in the VAS score was observed in 69% of patients undergoing the procedure, as compared to only 35% of the control group⁽²⁸⁾. Ibrahim et al.⁽²³⁾ observed a more substantial reduction in pain among patients undergoing shockwave therapy in their sample, with a mean VAS score of 8.52 prior to the procedure, dropping to a mean of 0.64 after four weeks, and remaining at low levels throughout the two-year follow-up period (Table 1).

Table 1. Results of randomized controlled trials

Author	Year	Sample size	Follow-up time (weeks)	Groups	Time for 60% reduction of VAS (weeks)
Ibrahim et al. ⁽²³⁾	2017	50	104	Shockwave therapy	4
				Placebo	not observed
Karimzadeh et al. ⁽³¹⁾	2017	36	12	Corticosteroid infiltration	4
				PRP infiltration	4
				Stretching	not observed
Mahindra et al. ⁽¹⁶⁾	2016	75	12	PRP infiltration	12
				Corticosteroid infiltration	4
				Placebo infiltration	not observed
Gollwitzer et al. ⁽²⁸⁾	2015	146	12	Shockwave therapy	12
				Placebo	not observed
Kim et al. ⁽³²⁾	2015	40	12	Polydeoxyribonucleotide (PDRN) infiltration	not observed
				Placebo	not observed
Chew et al. ⁽³³⁾	2013	54	24	Shockwave therapy	not observed
				PRP infiltration	24
				Stretching	not observed

Among the articles that met the inclusion and exclusion criteria imposed in this study, two evaluated the treatment with corticosteroid and platelet-rich plasma (PRP) concentrate infiltration in the painful area of the foot. The first one randomized 75 people with a clinical diagnosis of plantar fasciitis refractory to first-line treatment, dividing its sample into three randomized groups, in which all participants underwent infiltration of the plantar region, one group with saline solution (placebo group), another with corticosteroid, and the last with PRP, with a three-month follow-up period. A statistically significant reduction in the VAS score was observed only in the patients from the groups undergoing the proposed treatment, with the VAS decreasing from a mean score of 7.7 prior to the procedure to 2.84 in the corticosteroid therapy group after just three weeks. The PRP group also experienced a reduction in the mean VAS score from 7.4 to 3.7 in the same circumstances, and a mean of 2.52 after completing three months of follow-up⁽¹⁶⁾.

The second article presents a sample of 36 patients diagnosed with chronic plantar fasciitis. The researcher randomized the sample into three statistically similar groups, one receiving corticosteroid infiltration, another PRP infiltrate, and the control group, in which there was no infiltration of placebo substance, just continuing with the first-line treatment. All were reassessed after one and three months, with the best results with statistical significance being observed in the groups receiving infiltration, with a decrease of approximately 60% in the VAS score three months after the procedure. Conversely, in the control group there was a small decrease in the VAS score, without statistical significance⁽³¹⁾.

Kim et al.⁽³²⁾ showed an important improvement in pain after three months of Polydeoxyribonucleotide (PDRN) infiltration in a sample of 40 patients with chronic plantar fasciitis refractory to conservative treatment for at least six months. A significant improvement in pain was observed in the group receiving infiltration in the fourth week after infiltration, yet with a more substantial improvement after three months of follow-up. The placebo group, as other studies have shown, progressed with limited pain relief according to the VAS score. However, the decrease in the VAS score did not fall below 60% throughout the follow-up period of the groups. This shows us that first- and second-line treatment can prove insufficient in these patients, requiring additional second-line therapies or even surgical treatment.

When evaluating national and international medical expert examination procedure manuals, we observed that the guidelines for leave time of workers with plantar fasciitis range

from zero to three weeks⁽³⁴⁻³⁷⁾. No distinction was observed with regards to disease duration, or whether the condition was acute or chronic. American manuals distinguish between the types of work activity performed by the professional, recommending longer leave for those who perform heavier jobs^(35,36). Because plantar fasciitis is more prevalent in workers who need to remain standing for long periods, we consider this criterion necessary when making the decision regarding the necessary duration of leave (Table 2).


Table 2. Manuals of evaluated procedures and respective recommended leave times

Manual	Time
Manual de Procedimento de Perícias Médicas	10 days
Return to Work & Disability Duration Guideline	0-14 days
Disability Duration Guidelines	0-21 days
Tiempos Estándar de Incapacidad Temporal	20 days

Although some studies show that pain control is achieved after just four weeks of second-line therapy, we observed that this improvement is more relevant over the course of the third month of follow-up. Other controlled studies are needed to objectively assess the impact of the worker's continuing to work on the treatment of chronic plantar fasciitis. However, we are of the opinion that to achieve a more reliable assessment of the necessary duration of leave, in addition to categorizing leave times by the type of work, as is the case in the American manuals, the assessment of treatment time would be beneficial in deciding on the necessary leave time.

Conclusion

We observed that pain management in patients with chronic plantar fasciitis is a difficult task if we use conservative first-line treatment alone, as these cases generally progress with significant improvement in pain after four to 12 weeks when the treatment is combined with effective second-line treatment. Expert medical examination procedure manuals recommend an average leave time of zero to 21 days, with only two scaling leave time according to the type of work. None of the manuals took into account the period of treatment already undergone by the worker.

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