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Comparison between physiotherapy (Stretching exercise) vs platelet-rich plasma in chronic plantar fasciitis

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Abstract

Introduction: Plantar fasciitis is a common disorder of the degenerative tissue of the plantar fascia, and not inflammation. Various treatment options are available, including nonsteroidal anti-inflammatory drugs, corticosteroid injections, orthosis and physiotherapy. This study compared the effects of physiotherapy (Stretching exercises) with a local injection of platelet-rich plasma in the treatment of chronic plantar fasciitis.

Material and Method: In this study, patients were randomly divided into 2 groups of 25 each. Patients were assessed on a visual analogue pain scale and on the ankle and hind paw scale of the American Society of Orthopedic Foot and Ankle (AOFAS) before and after treatment after 4 weeks and 4 months.

Results: The average score on the visual analog scale in physiotherapy groups (Stretching exercises) and in plasma with a high platelet content decreased from 7.24 and 7.02 before treatment to 2.82 and 3.34. Rich in platelets, it improved from 51.56 and 53.72 before treatment to 87.24 and 81.32 in 4 months. There was a significant improvement in the visual analog scale and AOFAS in physiotherapy (Stretching exercises) and in groups of platelet-rich plasma after 4 weeks and 4 months.

Conclusion: The authors concluded that physiotherapy is also effective as injection of plasma, enriched with platelets, in the treatment of chronic plantar fasciitis.

Keywords: plantar fasciitis, treatment, physiotherapy, injection of plasma enriched with platelets

Introduction

Plantar fasciitis is a common cause of pain in the heel. The diagnosis is mainly based on history and clinical examination. Long-term weight, obesity, and reduction in plantar flexion are well-described risk factors [1]. Non-surgical treatment options include nonsteroidal anti-inflammatory drugs (NSAIDs), night tires, ice packs, stretching the plantar fascia, corticosteroid injections and extracorporeal shock wave therapy. In more than 70-80% of patients, symptoms are eliminated with the help of these non-operational measures [2]. In 10% of cases, patients do not recover with the help of conservative measures, and the disease becomes chronic [3]. Delayed onset of treatment, obesity and bilateral diseases are risk factors for chronic disease.

According to the author, no study evaluated the effect of physiotherapy (stretching exercises) on platelet-rich plasma in chronic plantar fasciitis. Topical administration of platelet-rich plasma is a new concept for the treatment of tendon and ligament diseases, including plantar fasciitis. Injection of platelet-rich plasma releases platelets and growth factors in high concentrations directly at the site of injury, which is otherwise not available for growth factors as a result of hypovascular and hypocellularity [4, 5].

Although previous studies have compared the administration of plasma and platelet-rich corticosteroids with variable results, it is important to show that the improvement is the result of treatment rather than the usual course of the disease. This study is the first prospective, randomized study comparing the effectiveness of physiotherapy (stretching exercises) and platelet-rich plasma in chronic plantar fasciitis.

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Table 1: Patient demographic characteristics

Characteristic	Group A (n=25)	Group B (n=25)
Age, mean±SD, y	32.72±7.42	30.92±8.61
Sex, male:female	6:19	9:16

Table 2: Comparison between groups A and B

Score/Group	Before treatment	4 Weeks	4 Months
Visual analog scale score, mean±SD			
Group A	7.24±1.04	3.66±1.53	2.82±1.71
Group B	7.02±1.17	2.64±1.46	3.34±1.62
<i>P</i>	.37	.35	.22
American Orthopaedic Foot and Ankle Society score, mean±SD			
Group A	51.56±11.1	82.92±12.12	87.24±8.76
Group B	53.72±11.79	87.6±6.77	81.32±6.39
<i>P</i>	.22	.31	.00

Materials and Methods

Group A was prescribed toe walking physiotherapy twice a day for 10 minutes and stretching exercises with a roller for 3 minutes twice a day, while group B was prescribed for topical administration of rich plasma in platelets at maximum sensitivity. Heel with a needle 22 g, which uses the portal with one skin and 4-5 fascia penetrations. Injections were carried out under aseptic conditions as a daily procedure. Patients were instructed not to use NSAIDs. After the injection, it was recommended that patients use ice to relieve pain. If necessary, continue to wear comfortable shoes with pillows. All patients received physical therapy to stretch the calf muscles and plantar fascia. Patients were evaluated before and during follow-up at 4 weeks and 4 months. The evaluation was performed using a visual analogue scale to evaluate pain and ankle and hind paws of the American Society of Orthopedic Feet and Ankles (AOFAS). In groups A and B, the visual analogue scale before and after treatment and the AOFAS values were compared after 4 weeks and 4 months of follow-up.

Results

The average age of patients in groups A and B ranged from 32.72 to 30.92 years (Table 1). The average score on the visual analogue scale in groups A and B before treatment was 7.24, 7.02, which improved to 3.66, 2.64, respectively, after 4 weeks and 2.82, 3.34, respectively, after 4 months. The mean score of AOFAS in groups A and B before treatment was 51.56, 53.72, which improved to 82.92, 87.06, respectively, after 3 weeks of observation and 87.24, 81.32, respectively, after 3 months observations. Comparison of groups A and B did not show significant differences in the visual analogue scale and in AOFAS scores before treatment (Visual analogue scale, $P = .37$, AOFAS scale, $P = .22$). After 4 weeks, group B had the best result (Low score on the visual analogue scale and high AOFAS score) compared to group A, but the difference was not significant (Score on the visual analogue scale, $P = 0.35$; AOFAS rating, $P = .31$). After 4 months in group A, the AOFAS score was significantly higher than in group B, but the difference in points on the visual analog scale was not significant (Score on the visual analog scale, $P = .22$, AOFAS scale, $P = .00$) (Table 2).

Discussion

Many authors believe that plantar fasciitis is a degenerative condition of the tissue, and not inflammation at the site of the plantar fascia in the middle of calcicaria tuberosity [6, 7]. Collagen degeneration occurs at the site of injury due to the presence of microteara unhealed fascia. The histological

characteristics of chronic plantar fasciitis do not show invasion of inflammatory cells at the site of the lesion, as well as the normal fascia surrounding tissues are replaced by angiofibroblastic hyperplastic tissue [7, 8]. Injection of platelet-rich plasma releases platelets with growth factors in high concentrations directly at the site of injury, which is otherwise not available for growth factors due to hypovascular and hypocellularity [9]. Plantar fasciitis by increasing migration and proliferation of fibroblasts, increasing vascularization and improving collagen deposition. Previous studies have described the injection of platelet-rich plasma as an effective treatment option for chronic plantar fasciitis.

Monto [11] found that injection of platelet-rich plasma was more effective and durable than corticosteroid injection after 2 years of follow-up in a study of 40 patients.

Shetty *et al.* [12] compared the efficacy of platelet-rich plasma and corticosteroid injections in 60 patients and found no significant differences after 6 months of follow-up.

The current study showed that physiotherapy and platelet-rich local plasma were effective after 4 weeks and 4 months of follow-up, with significant improvement in the visual analogue scale and AOFAS scores. Platelet-rich plasma showed a significant difference compared to the physiotherapy group after 4 weeks. After 4 months of follow-up, physiotherapy showed significantly better results compared to injection of plasma enriched with platelets, according to the AOFAS scale, but both had the same results according to the scale of the visual analogue scale.

Limitations

In the current study, the sample size was small, and a large sample was required to confirm the results and the long observation time.

Conclusion

The authors concluded that physiotherapy is as effective as platelet-enriched plasma injections in the treatment of chronic plantar fasciitis after 4 months of observation and avoids modern and expensive options

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