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STUDY OF PLATELET RICH PLASMA VRS CORTICOSTEROID INJECTION IN CHRONIC PLANTAR FASCIITIS: A TEACHING HOSPITAL BASED COMPARATIVE STUDY

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ABSTRACT

Background: The treatment for plantar fasciitis (PF), a prevalent cause of heel discomfort, is not yet standardized. Despite being the two most often utilized methods, platelet-rich plasma (PRP) and corticosteroid (CS) injections, little attention has been paid to comparing their contributions to long-term functional improvement.

Materials and Methods: 56 cases of plantar fasciitis in all, divided into two groups of 28 participants each, were included in the study from the outdoor orthopaedics department. Following a straightforward randomization process using computerized random numbers, participants were randomized to one of two treatment groups.

Results: There were no notable differences between the therapy groups, according to demographic data. When compared to corticosteroid therapy, PRP therapy consistently produced lower Visual Analog Scale (VAS) pain scores at all follow-up intervals. Furthermore, PRP-treated patients had higher Foot and Ankle impairment Index (FADI) ratings, indicating a larger improvement in functional impairment. Over the course of the trial, patient satisfaction was noticeably better in the PRP group. The two groups experienced comparable adverse effects.

Conclusion: When compared to corticosteroid injection therapy for plantar fasciitis, PRP injection therapy is more effective at lowering pain intensity, improving functional impairment, and raising patient satisfaction.Moreover, the safety profile of PRP therapy is similar.These results support the use of PRP as a recommended therapeutic alternative in clinical settings.

Keywords: Injections of corticosteroids, plantar fasciitis, platelet-rich plasma, the degree of pain, and functional impairment

INTRODUCTION

One of the most frequent causes of heel pain is plantar fasciitis (PF), which presents as discomfort that originates from the plantar fascia's insertion close to the calcaneal tuberosity's medial process. It is worse at the first step in the morning and on getting up from sitting position or on long standing.[1]

Policeman's heel, heel spur syndrome, jogger's heel, sub-calcaneal pain, plantar heel pain, plantar fasciopathy, plantar fasciitis (PF), and plantar fasciosis are some of the terms used to describe discomfort at the plantar surface of the heel.[2] About 8% of athletes have PF, which has an annual incidence that ranges from 3.83 to 10.5/1000 population, with a higher incidence in females.[3]Higher body mass index and advancing age are linked to an increased risk of heel pain.[4] Clinical diagnosis is made based on the patient's medical history and palpable discomfort at the plantar fascia insertion point (on the medial process of the calcaneal tubercle).[5] Some patients respond well to conservative treatment for plantar fasciitis,

which includes strapping, orthoses, cold packs, night splinting, stretching, non-steroidal anti-inflammatory drugs, and shoe changes. Treatment options for situations that are resistant include injectable therapy, extracorporeal shock wave therapy (ESWT), and in certain cases, surgical release of the plantar fascia's origin.[6]An essential component of early treatment is corticosteroid injection. Nevertheless, there is mixed information about the efficacy of steroid injection. A cutting-edge new treatment called platelet rich plasma (PRP) therapy reduces pain by promoting the long-term repair of musculoskeletal disorders.[7] Platelet-rich plasma (PRP) injections have shown encouraging results recently in treating degeneration and injuries to the muscles and tendons.[8] Ferrari et al. employed autologous PRP for the first time in 1987.[9] Increased platelet concentration in platelet-rich plasma aids in the repair of muscles and bones. PRP is utilized for tissue repair, which is facilitated by various growth factors and cytokines. With a high cytokine and cell content, PRP boosts tendon regenerating capabilities in hyperphysiologic levels that encourage cellular chemotaxis, matrix production, and proliferation.[10] Numerous growth factors that can contribute to tissue regeneration processes are released when platelets' alpha granules degranulate. Numerous foot and ankle conditions, such as tendinopathy (achilles, peroneal, posterior tibial, flexor hallucis longus, and anterior tibial) and chronic ligamentous damage (plantar fasciitis), can be treated with PRP.[11] In this study, we examined the effects of platelet-rich plasma and local corticosteroid injections (methyl prednisolone) on patient outcomes for persistent plantar fasciitis.

MATERIALS AND METHODS

This present study was carried in the department of Orthopedics, World College of Medical Sciences Research and Hospital during the period from January, 2022 to September, 2023. 56 cases of plantar fasciitis in all, split into two groups of 28 participants each, were included in the study from the outdoor orthopaedics department. Following a straightforward randomization process using computerized random numbers, participants were randomized to one of two treatment groups.Group I recipients received a local injection of autologous platelet-rich plasma, while Group II recipients received a single injection of 1 milliliter of local methyl-prednisolone (40 mg/ml) under local anesthesia.All subjects provided written informed permission, and the Ethics Committee approved the study protocol.

Inclusion Criteria: Patients between the ages of 20 and 70 who had a diagnosis of plantar fasciitis verified by imaging tests and physical examinations met the inclusion criteria.

Exclusion Criteria: Patients with a history of prior foot surgery, systemic foot diseases, coagulation disorders, recent corticosteroid injections, or PRP therapy within the past six months were excluded.

Patient satisfaction, functional impairment, and pain intensity were the primary characteristics evaluated. Validated measures such the Foot and Ankle Disability Index (FADI) for functional disability, the Visual Analog Scale (VAS) for pain, and the Likert scale for patient satisfaction were used to measure these. At the first appointment, baseline parameters, clinical history, and patient demographics were gathered. Following therapy, follow-up evaluations were carried out at predetermined intervals (1, 3, and 6 months). During these follow-up visits, data on patient satisfaction, functional impairment, and pain severity were documented. Any negative consequences or issues were also noted.

Statistical Analysis: Statistical analysis was performed using SPSS version 20.0.Inferential statistics including independent t-tests and chi-square testing were used to compare the PRP and corticosteroid injection groups. Statistical significance was defined as P-values below 0.05.

RESULTS

56 participants with a diagnosis of plantar fasciitis were enrolled in the trial; 28 were assigned to each of the two treatment groups, which included platelet-rich plasma injection therapy and corticosteroid injection therapy. Age, gender distribution, baseline BMI, and duration of symptoms did not significantly differ between the two groups, according to Table 1 demographic analysis ($p > 0.05$).

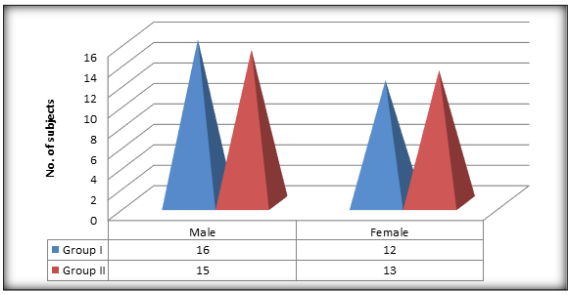

Figure 1: Shows the distribution of subject's a/c to gender

Table1:Shows the demographic details of patients at the time of presentation

Variables	PRP Group-I	CorticosteroidGroup-II	P-value
Age in years	47.8 ± 12.06	46.4 ± 11.36	0.14
Body Mass Index	27.2 ± 6.24	27.4 ± 6.32	0.21
Duration of Symptoms (Months)	7.9 ± 2.05	8.02 ± 2.56	0.28

At each follow-up interval, there were notable differences in the two groups' levels of pain (Table 2).When compared to patients getting corticosteroid injections, PRP injection recipients reported significantly lower pain scores on the VAS at the 1-month follow-up (3.2 ± 1.4 vs. 4.5 ± 1.2, $p < 0.001$).The PRP group continuously reported lower pain scores than the corticosteroid group ($p < 0.01$) during the 3- and 6-month follow-ups, continuing this pattern.

Table 2: Shows the pain intensity and functional disability scores

Follow-up Interval	Study groups	Pain Intensity	Functional Disability
1 Month	PRP Group	3.4 ± 0.78	79.21 ± 15.4
	Corticosteroid Group	4.6 ± 1.06	66.51 ± 13.32
3 Month	PRP Group	2.9 ± 0.64	87.6 ± 16.46
	Corticosteroid Group	3.9 ± 1.02	74.54 ± 14.24
6 Month	PRP Group	1.8 ± 0.06	93.4 ± 18.58
	Corticosteroid Group	2.4 ± 0.72	82.4 ± 15.08

The functional impairment of both therapy groups significantly improved over time.However, the PRP group outperformed the corticosteroid group in terms of functional impairment improvement at each follow-up period ($p < 0.04$).Specifically, when it came to mean FADI scores at 1, 3, and 6 months, the PRP group performed better than the corticosteroid group. On a Likert scale, the PRP group continuously outperformed the corticosteroid group in terms of patient satisfaction at every follow-up time point ($p < 0.04$).In contrast to 87% of patients in the PRP group who reported being "very satisfied" with the treatment outcome at the 6-month follow-up, only 68% of patients in the corticosteroid group indicated the same level of satisfaction. The frequency of adverse events did not significantly differ between the two treatment groups. Infection, edoema, and injection site discomfort were similar in both groups ($p > 0.03$).

DISCUSSION

Adults with plantar fasciitis frequently experience inferior heel pain, which significantly impairs their range of motion.[12] Doctors are still perplexed by it because no specific combinations of training, biomechanical, or clinical variables have been identified as causal causes for the development of persistent plantar fasciitis.[13] Despite being regarded as one of the therapeutic options, corticosteroid injections have short-term effects and are linked to problems such as fat atrophy and plantar fascia rupture.Platelet rich plasma (PRP) has been employed as an alternate treatment for persistent plantar fasciitis in regenerative medicine recently, and it has been linked to better pain and function scores. For plantar fasciitis, a comparison of PRP injection therapy and corticosteroid injection therapy showed that PRP treatment was significantly superior to corticosteroid treatment in terms of pain relief, functional improvement, and patient satisfaction. In comparison to the corticosteroid group, patients who received PRP injections reported consistently lower VAS pain scores at all follow-up intervals and larger improvements in functional impairment as measured by the FADI. Over the course of the study, the PRP group also had noticeably greater levels of patient satisfaction.Crucially, there were no appreciable variations in adverse events across the two treatment regimens, and their safety profiles were similar.According to these results, PRP injection therapy is superior to corticosteroid injection therapy for improving functional impairment, lowering pain levels, and raising patient satisfaction in plantar fasciitis patients.Additionally, throughout a 6-month follow-up period, PRP therapy showed consistent benefits with a safety profile similar to that of corticosteroid injections. Numerous studies have examined the relative efficacy of PRP and corticosteroid injections in the treatment of plantar fasciitis, with illuminating findings. PRP may be used to treat plantar fasciitis that is not improving with conservative measures, according to a study that demonstrated its capacity to draw in inflammatory mediators for collagen remodelling.[14]According to the findings of another study, PRP injections provide a more secure and long-lasting treatment for persistent plantar fasciitis than corticosteroids.[15]For chronic recalcitrant instances, a study supported these conclusions by demonstrating PRP's improved durability and efficacy over steroid injections, with benefits lasting at follow-up.[16]In a similar vein, a comparative investigation showed that PRP is a better long-term management choice than corticosteroids since it dramatically decreases pain and improves functional outcomes.[17] PRP's long-term success in treating chronic refractory plantar fasciitis is further supported by a randomized controlled research that discovered that, although PRP's advantages last, the effectiveness of corticosteroid injections starts to decline after three months.[18] All of these trials highlight the benefits of PRP in giving patients with plantar fasciitis long-lasting relief and improved function.

CONCLUSION

According to the study, PRP injection therapy is more effective than corticosteroid injection therapy for treating plantar fasciitis.Comparable safety profiles were noted between PRP therapy and corticosteroid therapy, and PRP therapy regularly

showed lower pain levels, greater improvement in functional impairment, and improved patient satisfaction.These results highlight PRP therapy's ability to offer long-term relief and enhance patient outcomes, hence supporting its adoption as the recommended treatment choice for people with plantar fasciitis.

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