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ORIGINAL ARTICLE

Comparison of platelets-rich-plasma vs steroids in treatment of plantar fasciitis.

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ABSTRACT… Objective: To evaluate the effectiveness of Platelets-Rich-Plasma therapy against Steroid therapy in the treatment of Planter fasciitis. **Study Design:** Quasi Experimental study. **Setting:** Department of Orthopedic, Hayatabad Medical Complex, Peshawar. **Period:** January to June 2021. **Material & Methods:** In which participants were divided into two groups (steroid vs PRP). A total of 61 individuals with PF who have failed to respond to conservative therapy were intervened. 31 of them received steroid injection while 30 participants received PRP. The AOFAS and the VAS scoring system were recorded pre- and post-injection phases at 4 weeks, 3 months and 6 months period to evaluate the outcomes. Statistical analyses were performed to compare between the two means. **Results:** In both groups, the VAS, the AOFAS, and PF thickness improved significantly after injection. However, based on the available data, there was no discernible difference in improvement between the two groups for the above-mentioned factors. **Conclusion:** In our study, we found that both steroid and PRP injections had no statistically significant differences in VAS and AFAS scores (post treatment), we found that both were equally beneficial in treating Planter Fasciitis.

Key words: Plantar Fasciitis, Platelet Rich Plasma (PRP), Pakistan, Steroids.

INTRODUCTION

Plantar fasciitis (PF) is a prevalent condition that affects one out of every ten people.[1] It is the most prevalent cause of adult heel discomfort. The patient often complains of discomfort that becomes bleaker with time and is most apparent while taking the initial few strides in the morning. After a brief time of walking, the discomfort may subside, but it returns while undertaking rigorous activities.[2] Non-athletes are more likely to develop PF as they spend the most of their workday on their feet. According to one study, the largest risk factor in non-athletes is decreased ankle dorsiflexion. Limited ankle dorsiflexion leads the foot to over pronate, putting greater strain on the plantar fascia.[3]

In 80 to 90 percent of patients, it is self-limiting ailment, symptoms usually improve after 10 months. This procedure, however, may be challenging for both the patient and the practitioner. When rest, activity restriction, and conservative therapies fail to provide an acceptable result, the patient may consider treatment alternatives other than surgery. PF currently has no viable nonsurgical therapy options. Nonsurgical therapy for PF should be as successful as surgical treatment with fewer side effects.[4] One of those non-surgical option is platelet rich plasma (PRP). PRP has potent anti-inflammatory capabilities with no known negative effects on the plantar fascia. PRP has demonstrated encouraging effects in the treatment of PF in recent researches. However, whether it is more efficacious than other therapies in alleviating pain and increasing function is questionable.[5,6]

Another traditional method is the use of corticosteroids. Because of their intrinsic anti-inflammatory characteristics, CS injections are beneficial; while CS may give temporary pain relief, its long-term efficacy in the treatment of PF is debatable.[7] Although both treatments are effective for treating PF, few studies have

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compared the use of corticosteroids and PRP, so it's still unclear which is better. So, the aim of this study is to compare the effectiveness of corticosteroids and platelet rich plasma in the treatment of PF.

MATERIAL & METHODS

From January to June 2021, individuals who were treated for PF with PRP or steroid injections were enrolled in this quasi-experimental research. This research comprised all individuals with PF who had been diagnosed and treated conservatively with analgesics for at least three months but showed no response. The exclusion criteria were any fracture or trauma at the same ankle or foot, pervious surgery at the same site, previous history of tarsal tunnel syndrome, bone cyst or bone tumor, osteomyelitis, achilles tendinopathy, any systematic disorder like diabetes, rheumatoid arthritis, haematological disorders, gout and pregnancy.

A total of 65 individuals were treated for PF, with 32 receiving steroid injections and 33 receiving PRP. Due to rigorous inclusion criteria, only 61 patients, 31 in the steroid group and 30 in the PRP group, were included in the final analysis. Thirty-one patients were given a local injection of 40 mg methylprednisolone and 2 mL prilocaine (metilprednizalone). The other 30 patients in second group were treated with 3 mL PRP after 2 mL prilocaine injection. All patients were consented and institutional review board approval was obtained before starting this study. The base line characteristics were age, gender, height and duration of pain as mentioned in Table-I.

This procedure was executed using the twofold centrifugation method. To separate erythrocytes, 25 cc venous blood was centrifuged at 1,800 rpm for 15 minutes in the first stage. The blood sample was centrifuged for 10 minutes to concentrate platelets and create a unit of 3mL PRP in the second stage. The patient was laying prone with the ankle in a neutral posture, and the injection was administered by palpating the most sensitive spot on the medial side.

Patients were told to apply ice to the injection site after the procedure to ameliorate swelling and discomfort. They were also advised to avoid weight bearing at least for 3 days following injection. It was also instructed to avoid physical activities like running, jogging and other activities at least for 2 weeks after injections in both groups. Some stretching and isometric exercises for PF were taught to all patients. However, all other additional treatments like NSAID, night splint and orthosis were not permitted after injections for both groups.

The outcome measures were visual analogue score (VAS)[8] to report pain intensity and American foot and ankle score (AFAS)[9] to evaluate functional outcomes at affected foot. The VAS is valid and reliable tool to measure pain intensity, scoring system begin from 0 means no pain to 10 means worst pain possible. All outcomes were measured at pre- treatment, 4 weeks, 3- and 6-months post treatment to compare the effectiveness of treatment.

IBM SPSS Version 26 software was used to perform analysis of the study. Descriptive statistics used to compute percentages and mean for general demographics. The independent t-test was used to find difference between age, height and baseline VAS between two groups. Independent (two sample) T-test was performed to analyzed the difference between compare scores of VAS and AFAS scores between steroid and PRP group.

RESULTS

The mean age of all patients was 35 (±8) years, A total of 61 patients were analyzed in this study, with almost 56% (n=34) being male and 44% (n=27) being female patients. The general demographics and other details of both groups are mentioned in Table-I below. The mean duration of symptoms in all patients were 5.5 ±1.2 months. There was no statistically significant difference between age, height and baseline VAS between two groups (p=0.32 and 0.25).

Patient's Characteristics		Steroid Group (n=31)	PRP Group (n=30)
		Mean (± SD), n (%)	Mean (± SD), n (%)
Age (in years)		35 (±8)	35 (±8)
Gender	Males	17 (55%)	17 (57%)
	Females	14 (45%)	13 (33%)
Height (in cm)		166.66 (±3.96)	166.57 (±3.98)
Duration of pain (in months)		5	5.6
Pre- treatment AFAS		63.61 (±3.24)	63.56 (±3.28)
Post-treatment after 4 weeks AFAS		68.77 (±3.37)	68.76 (±3.43)
Post-treatment after 3 months AFAS		75.38 (±3.50)	75.33 (±3.55)
Post-treatment after 6 months AFAS		80.54 (±2.80)	80.53 (±2.84)
Pre-treatment VAS		7.25 (±0.89)	7.26 (±0.90)
Post-treatment after 4 weeks VAS		5.90 (±0.83)	5.90 (±0.84)
Post-treatment after 3 months VAS		3.87 (±0.61)	3.90 (±0.60)
Post-treatment after 6 months VAS		1.80 (±0.65)	1.83 (±0.64)

Table-I. Baseline characteristics of patients for both treatment groups
***AFAS= American foot and ankle score; VAS= Visual analogue scale**

In both steroid and PRP groups pain intensity reduced at every follow up and statistically lower than baseline or pre- treatment scores with P value < 0.05 (P= 0.03, 0.04). All means values for VAS in both groups are mentioned in Table-I and comparison of the mean VAS score (baseline & 6 months) can be seen in Figure-1 below.

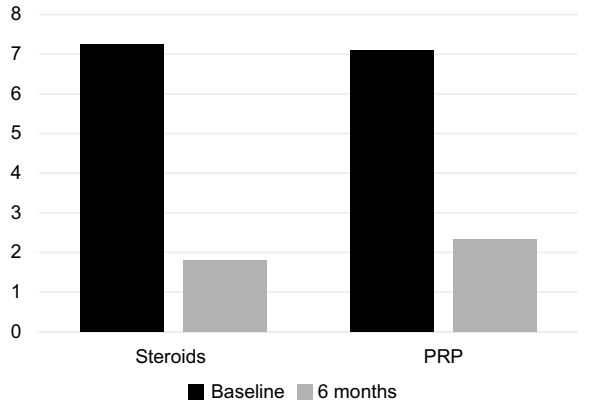

Figure-1. Comparison of Mean VAS scores (at Baseline & 6 months) by Treatment Group.

The mean AFAS also improved after every follow up (4 weeks, 3 and 6 months follow up) in both groups as shown in Table-I and comparison of the mean AFAS score (baseline & 6 months) can be seen in Figure-2 below. However, there was no statistical difference found between the baseline and 6 months (post-treatment) AFAS scores within both groups.

The mean AFAS after 6 months of treatment was 80.54 (±2.80) in steroid group and 80.53 (±2.84) in PRP group respectively. However, there was no statistically significant difference found between the two groups (Table-II below). The mean VAS after 6 months of treatment was 1.80 (±0.65) in steroid group and 1.83 (±0.64) in PRP group. There was also no statistically significant difference found between the VAS scores of both groups (Table-II below).

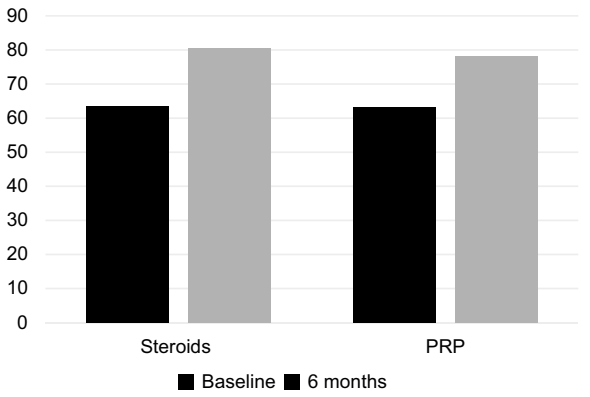

Figure-2. Comparison of Mean AFAS scores (at Baseline & 6 months) by Treatment Group.

DISCUSSION

PF may be addressed with a myriad of nonsurgical treatment options, each with a different success rate. The best therapy for it is yet to be discovered. PF has an unknown underlying pathophysiology. Increased vascularity, an abundance of ground material proteins, and localized regions of fibroblast growth and damaged collagen fibers

are all frequent pathogenic characteristics.[10] In the literature, there is no evidence that gender is linked to PF. The difference was not statistically significant in this research as well.

Scoring Scale	Steroid Group Mean (± SD)	PRP Group Mean (± SD)	P- Value
Post- treatment. 6 months AFAS	80.54 (±2.80)	80.53 (±2.84)	0.98
Post- treatment 6 months VAS	1.80 (±0.65)	1.83 (±0.64)	0.87

Table-II. Comparison of Post-treatment VAS and AFAS scores between steroid and PRP group *Independent (two-sample) T-test was applied to assess the difference between both treatment groups

Lemont et al. found no histological inflammation in PF histology samples. These puzzling results on the genesis of PF remain unsolved. Many therapeutic options have been explored, including corticosteroid injections, although they only proved to be effective in the short term and to a limited extent. Potential steroid injection complications raise some questions about whether the benefits outweigh the risks.[11] PF is a degenerative disease, according to histological investigations, therefore the steroid's anti-inflammatory effect via prostaglandins is unknown. The positive impact of steroid injection might be explained by corticosteroids inhibiting fibroblast growth and expression of ground substance proteins.

PRP has been demonstrated to be a viable therapeutic option for persistent PF in several studies.[12-14] PF is a degenerative tissue disease characterized by microtears in the fascia rather than inflammation. As PRP is enriched with growth factors, it disseminates them directly to the site where lesion is present. There it stimulates angiogenesis and fiber repair by accelerating migration of the fibroblast and optimizing collagen deposition.[15]

In our study we noted that both PRP and steroid improved both AFAS and VAS score at six months and there was no statistically difference among them i.e. both were equally efficacious post operatively. Our results are inconsistent with Shetty et al study in which PRP results were better than steroids. The study was also of short term duration i.e. only 3 months. However, their findings were preliminary, and no data on outcomes beyond the 3-month mark was provided.[16] In another study, PRP and Steroid were compared in 60 (30 in each arm) individuals by Aksahin et al. The VAS ratings improved for both groups at 3 weeks and 6 months after injection, with no statistically significant difference between groups.[17] These results are comparable to our findings.

PRP was applied to the heel at the site of greatest tenderness in this research. Previous research has recommended using ultrasonic guidance for injections in PF because it may allow for more precise injection placement. In the treatment of idiopathic PF, however, data from Tsai and Kane's studies showed that ultrasound-guided injection was no more successful than palpation-guided injection.[18,19]

PRP is valuable in and of itself, with less complications, but it entails the deployment of centrifuging equipment, which is expensive and mandatory for anybody who intends to give PRP in an outpatient environment, raising the cost by at least tenfold that of corticosteroids.

However, there are certain limitations of our study. PRP was applied to the heel at the site of greatest tenderness in this research. Previous research has recommended using ultrasonic guidance for injections in PF because it may allow for more precise injection placement. Also, the sample size was small, which could affect the generalizability of the results. Future research with a larger patient population, a longer follow-up period, and a control group might give a clearer understanding of the efficacy of the two therapy methods. Another drawback of this study is that it was not conducted under blind conditions.

CONCLUSION

In conclusion, both PRP and steroids appear to be an equally efficacious strategy for alleviating pain and optimizing functional outcomes. However, randomized, multicenter trials are needed to

better understand the optimal outcomes of both the regimens.

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2	Abdur Rauf	Data design, Concept.	
3	Wasim Anwar	Interpretation of the data.	
4	Haroon Ahmed Khan	Data collection.	