ORIGINAL RESEARCH PAPER

Orthopaedics

EFFICACY OF PLATELET RICH PLASMA IN RELIEVING PAIN AND IMPROVING FUNCTION IN PLANTAR FASCIITIS

KEY WORDS: platelet rich plasma, plantar fasciitis

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ABSTRACT

Platelet rich plasma(PRP) which is an autologus blood derived product, has in recent years emerged as a safe and cost effectivetherapy for pain relief and functional improvement in a variety of orthopaedic conditions like tennis elbow and plantar fasciitis . This study was undertaken to evaluate its efficacy and safety in patients of plantar fasciitis.74 patients were included in this study. Relief from pain and functional improvement were evaluated using VAS and FHSQ scores, before the procedure and at 6 weeks, 12 weeks and 24 weeks after the procedure. In our study, patients showed statistically significant improvement across both the measures of outcome. Mean value of VAS scores were 79.7 at 0 weeks,37.2at 6 weeks (p value .0036) ,30.07 at 12 weeks(p value .001) and 28.8 at 24 weeks(p value .0014).Mean value of FHSQ improved from68.2 at 0 weeks to37.6 at 6 weeks (p value .0018),31.4 at 12 weeks (p value .001)and 29.7 at 24 weeks (p value .001).

Based on these findings we can conclude that PRP when appropriately given provides significant relief from pain and improves function when injected locally in patients of plantar fasciitis. However further studies with larger number of patients and follow up of longer duration are required to further establish its long term efficacy

INTRODUCTION

Chronic plantar fasciitis is probably the most common cause of foot complaints, accounting for a significant number of midfoot and hindfoot symptoms, requiring professional care among adults. Conservative treatment options which range from rest to the specific part, use of non steroidal anti inflammatory agents, to injection of steroids at the site, frequently fail and also may lead to serious side effects. In recent years significant research has been done in the role of platelet rich plasma (PRP)(1), which is an autologus product derived from blood, in various orthopaedic conditions including tendinopathies like tennis elbow(2,3,4), patellar tendinitis(5), achilles tendinitis(6), plantar fasciitis(7)), shoulder impingement syndrome(8) articular cartilage avulsion (9)osteoarthritis of the knee(10) and avascular necrosis of femoral head(11). It acts by delivering high concentration of platelets derived growth factors and enhances tissue healing (11,12). Platelets present in PRP function as a tissue sealant, initiating wound repair whereas fibrin matrix acts as a drug delivery system slowly releasing various platelet-derived bioactive factors (13) such as vascular endothelial growth factor (VEGF), transforming growth factor (TGF)-b1, insulin-like growth factor (IGF) and platelet derived growth factor (PDGF),(14,15). PRP platelets are initially activated by thrombin and collagen, releasing growth factors that attract undifferentiated cells into the newly formed matrix and trigger cell division (16). PRP also inhibits cytokine release from macrophages, improving tissue healing and regeneration by limiting the inflammation (17), and can promote new capillary growth,(18). In this study we evaluate the safety and efficacy of PRP in patients suffering from plantar fasciitis.

MATERIAL AND METHOD

74 patients suffering from this condition who attended outpatient department of our institution, a 500 bedded tertiary care corporate hospital from July 2018 to June 2019 were included in this study. Inclusion criterion for the diagnosis were

1. Pain in the inferior aspect of heel that is usually worse with their first steps in the morning or after a period of inactivity (with maximal tenderness over the anteromedial aspect of the inferior heel).
2. Increased pain on passive dorsiflexion of foot.

Patients having plantar fasciitis as a part of systemic condition like diabetes, hypothyroidism or rheumatoid arthritis, and those who had received local corticosteroid injections were excluded from the study. All these patients had failed to respond to conservative management and voluntarily signed the consent forms to undergo this procedure and be the part of this study.

The PRP used in this study was obtained using standard technique. The blood drawn from the patient was taken in 10 ml tubes that contained citrate phosphate dextrose. These tubes were then centrifuged two times. Only one third of the original blood sample consisted of PRP and was used. 2-3 ml of PRP so obtained was used.

The patient was placed supine and the site palpated for maximal point of tenderness before giving a local anaesthetic. Under strict aseptic precautions local anaesthetic (2% xylocaine) followed by PRP is then injected into the affected site with a 18-guage needle, and patient is advised to rest for approximately 1 hr.

A crepe bandage is applied, and the patient is advised to use rubber footwear and avoid sports and athletic activities for 48 to 72 hr. After 3 days, the crepe bandage is removed, and the patient is allowed to do daily activities. After the procedure, the patient is prescribed broad spectrum antibiotics (cephalosporins) for 3 days. All NSAIDS are strictly avoided for 7 days after the procedure.

Visual Analog Score (VAS), and Foot Health status Questionnaire were used to evaluate the results. Both of them are validated instruments for such use (19,20)

Patients were then evaluated at at 0 weeks, (at the time of injection), at 6 weeks, 12 weeks and 24 weeks after the injection using VAS and FHSQ scores.

RESULTS

The mean age of the patients in this study group was 37.5 ± 15.5 yr, and it included 48 men and 26 women.

Patients showed statistically significant improvement across both the measures of outcome . Mean value of VAS scores were 79.7 at 0 weeks, 37.2 at 6 weeks (p value .0036), 30.07 at 12 weeks (p value .001) and 28.8 at 24 weeks(p value .0014).

Mean value of FHSQ improved from 68.2 at 0 weeks to37.6 at 6 weeks (p value .0018), 31.4 at 12 weeks (p value .001) and 29.7 at 24 weeks (p value .001).

Table 1 shows the mean VAS and FHSQ scores of patients at 0 weeks, 6 weeks, 12 weeks, and 24 weeks

	0 Weeks	6 Weeks	P value	12 Weeks	P value	24 Weeks	P value
VAS	79.7+ .76	37.2+6.2	.0036	30.07+5.2	.001	28.8+7.3	.0014
FHSQ	68.2+4.7	37.6+8.3	.0018	31.4+6.3	.001	29.7+7.5	.001

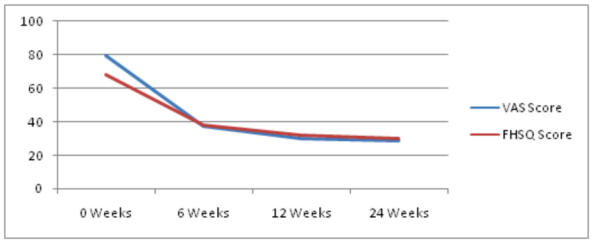

Figure 1 shows the mean VAS and FHSQ scores of patients at 0 weeks, 6 weeks, 12 weeks, and 24 weeks

DISCUSSION

Our study does sugge
st that local injection of PRP is an effective method to relieve pain and improve function in patients suffering with plantar fasciitis. Moreover it may be a safer option than surgery and local injection of steroids. Our results are similar to those described by Martinelli et al (19) who in their study demonstrated12 moths follow-up excellent results in 9 of 14 (64.3%) patients with chronic plantar fasciitis who received three injections of PRP into the plantar fascia, good results in two (14.3%), acceptable results in two (14.3%), and a poor result in one (7.1%) according to the Roles and Maudsley score. VAS for pain was significantly decreased from 7.1 ± 1.1 before treatment to 1.9 ± 1.5 at the last follow-up ($P < 0.01$)[29] In another study conducted by Barret et al (20) in which PRP injection was given under ultrasound guidance, complete pain relief was seen up to 1 yr in 77.8% of patients, Both these studies offer encouraging results of an alternative minimally invasive treatment for plantar fasciitis for which traditional nonsurgical modalities failed. In our study, we observed highly significant differences between VAS and FHSQ scores before and after injection ($P < 0.001$); After 12 to 24 weeks of injection, 75% patients had excellent VAS score improvement (> 50% reduction) and around 62% had reduction of FHSQ score (> 50%).

CONCLUSION

Plantar Fasciitis is a condition which causes significant morbidity and functional limitation. Patients often do not respond to conservative measures and repeated use of local injection of steroids may lead to serious consequences. Since patients showed improvement based on both of the validated measures of outcome, our study does suggest that local injection of PRP appeared to be a safe, cost effective and effective procedure to relieve pain and improve symptoms in patients suffering from plantar fasciitis. However further follow up studies of long duration with placebo control are required to establish the long term efficacy of this treatment option

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