

Intra-lesional Autologous Platelets Rich Plasma Injection Compared to Corticosteroid Injection for Treatment of Chronic Plantar Fasciitis

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Abstract

Background: Injection of autologous blood can stimulate a healing response in chronic tendon disorders.

Objective: To comparing the effectiveness of intralesional autologous plasma with intralesional corticosteroid injection for treatment of plantar fasciitis.

Patients and Methods: Sixty-one adult patients presented to the orthopedic clinic in Erbil Teaching Hospital from 1st of January, 2015 to 31st of December, 2015, with chronic proximal plantar fasciitis were included in this study. They were allocated into two groups, group A, the autologous plasma group (30 patient), and group B, the corticosteroid group (31 patients). Pain severity was assessed depending on visual analogue scale scores before treatment and at 2 weeks, 1 month, and 3 months after treatment.

Results: At first week and first month after treatment the pain reduction was significantly higher among corticosteroid group ($P = 0.012$ and 0.010 , respectively). While at third month after treatment there was no significant difference in pain reduction ($P = 0.11$). Reduction in visual analogue scale scores for both groups was significant over time ($p < 0.001$). However, the corticosteroid group showed an earlier sharp drop and a plateau in average pain levels at the lower end of the scale as early as 2 weeks.

Conclusion: Intralesional autologous plasma injection was effective in lowering pain and tenderness, although not as quicker than and as effective as the corticosteroid.

Key words: Intralesional Injections, Visual Analogue Scale, Autologous Plasma, Corticosteroids.

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Introduction

In ankle and foot practice, plantar fasciitis (PF) is the commonest health condition treated by health care providers[1]. It is a self-limiting disease affecting annually greater than one million people[2,3]. Approximately, greater than 10% of people affected by this condition

over their lifetime[2] of whom two thirds seeks medical care[4]. It is reported by many authors that PF is caused by a combination of overuse activities and poor foot and ankle biomechanics[5-7]. PF is characterized by severe pain at the medial border of calcaneus after prolonged inactivity which worsen by 1st few steps in the morning, and

walking or standing for a long period [2, 8] PF pain may disable the affected person from conducting their usual daily activities[9].

Although several therapies exist for treatment of PF, 90% of affected people improved with conservative therapies[10]. Platelets rich plasma (PRP) injections are one of these conservative therapies that believed to stimulate and accelerates tissue healing in PF[11].

Unlike local corticosteroid injections which weakens the plantar fascia and atrophy plantar fat pad; the PRP stimulate regeneration abilities at degenerated or injured site[11].

This study was conducted to confirm that intralesional autologous plasma injection is an effective method for treating plantar fasciitis and to find out whether its effect is comparable to that of local steroid injection.

Patients and Methods

Adult patients presented to the orthopedic clinic in Erbil teaching hospital from 1st of January, 2015 to 31st of December, 2015, with chronic proximal plantar fasciitis were included in the study. Heel pain for longer than 6 weeks which worsen at 1st steps in the morning or after long period of inactivity (sitting or lying) was diagnosed as chronic proximal plantar fasciitis. Patients presented with previous history of surgical interventions for heel pain, peripheral neuropathies, calcaneal tendon pathology, work injuries, and other medical and metabolic diseases (diabetes mellitus, gout, and rheumatoid arthritis), were excluded from the study. All patients enrolled in this study were fully oriented on the rationale of this trial. They gave their verbal informed consent to take part in different treatment group. Data were collected from different study groups using especially designed questionnaire that highlights basic demographic (age, gender, weight, height,

occupation) and clinical characteristics (duration of symptoms, and presence of a calcaneal spur) of patients enrolled in this study. Enrolled patients were allocated in two different groups. Those who receives local intra-lesional autologous plasma injection (group A), and those who receives local intra-lesional corticosteroid injection (group B). Both groups were matched for age. PRP was prepared by centrifuging a mixture of 10 ml of autologous blood with one ml of sodium citrate for a period of 15 minutes; then five ml of the resulted plasma was mixed with 2 ml of local anesthetic (lignocaine HCL 2%) and used for group A, as recommended by other workers . The corticosteroid injection was prepared by combining 80 mg of triamcinolone acetonide with 2 ml of local anesthetic (lignocaine HCL 2%) and was used for group B.

Same doctor on each occasion under aseptic technique, inject these preparations at the medial site of the heel using the technique of single skin portal with multiple fascia penetration (peppering technique). The injection method was a modification of that used by Lee and Ahmed[12]. Ten minutes after injection with close observation, patient was discharged with advice to avoid overuse activities (running, jumping) for 10 days. During this period patient were advised to report any associated events and to follow a stretching program for calcaneal tendon and plantar fascia. In case heel pain persists, repeated injections were conducted at 6-week intervals till a satisfactory outcome was obtained or patient refuse repeated injections of PRP [4].

Outcomes of this trial were assessed by the same doctor before treatment and at 2 weeks, 1 month, and 3 months after treatment as recommended in other studies.3 Assessment was done by the visual analogue scale (VAS) scoring system. This system is unidimensional measure of pain intensity that depends on the patient conviction in scoring

the morning pain occurring on rising from bed or after long period of inactivity. Pain intensity in this scoring system is scored zero when there is no pain, and 10 when the worst imaginable pain experienced [13, 14].

Statistical Analysis

The research ethics committee of the college of medicine of Hawler medical university approved this study. Student t-test, X2 test, and generalized linear model were used for statistical analysis as appropriate. P value ≤ 0.05 was considered statistically significant.

Results

A total of 61 patients were included in this study. They were allocated into two groups, group A composed of 30 patients while group B composed of 31 patients. In relation to age, gender, and body mass index no significant variations were noticed between the two groups. Similarly, no variations between the two groups were noticed regarding presence of a calcaneal spur, and duration of symptoms table (1). Before treatment, no significant variation (P =0.305)

was noticed in the mean VAS scorings between the two groups (A and B), while at 2 weeks and 1 month after treatment, group B showed significantly lower levels of pain than group A (P= 0.012 and 0.010, respectively). 3 months after treatment, although group B had lower average levels of pain than group A, but it was not significant (P = 0.11). Group A showed more gradual reduction in mean VAS than group B table (2). It was noticed that over the 3-months follow up period, a significant (P <0.001) reduction in the mean VAS occurred in both groups table (3). At 2 weeks and one month after injection, group A experienced significant reduction in mean VAS from the overall mean (intercept) with P value of 0.011 and 0.005, respectively. While at 3 months no significant difference was noticed between group A group B in the mean VAS scores (P=0.093) table (4).

Three (10%) of those in group A needed second injection versus two (6.5%) in group B. Both groups showed no fat atrophy, infection, or plantar fascia rupture.

Table (1): Baseline demographic and clinical characteristics of patients in the groups of autologous plasma and steroid therapy.

Variable	Autologous plasma	Steroid	P value
Number of patients	30	31	
Age (years) Mean ± SD* (range)	48.28 ± 10.46 (28–65)	49.2 ± 11.0 (29–66)	0.75
Gender (Female: Male ratio)	6.5: 1	14.5:1	0.64
Weight (kg) Mean ± SD	66.0 ± 13.39	66.3 ± 15.14	0.94
BMI (kg/m ²) Mean ± SD	26.0 ± 4.58	26.12 ± 5.0	0.94
Calcaneal spur (yes: no)	18/30 (60%)	15/31 (48.4%)	0.51
Duration of symptoms (months) Mean ± SD (range)	7.19 ± 5.59 (2–24)	8.4 ± 7.6 (2–24)	0.51

*Standard deviation

Table (2): Mean visual analogue scores of the groups at baseline, 2 weeks, 1 month, and 3 months after treatment.

Study groups	Mean ± SD of VAS			
	Before treatment	2 weeks after treatment	1 month after treatment	3 months after treatment
Autologous Plasma group	7.2 ± 1.9	4.5 ± 2.5	4.1 ± 2.7	3.8 ± 2.3
Steroid group	6.8 ± 1.8	2.7 ± 2.9	2.3 ± 2.6	2.7 ± 3.0
P value	0.305	0.012	0.010	0.11

Table (3): Mean visual analogue scores of both groups at baseline and at 3 months after treatment.

Mean ± SD of VAS	Study group	
	Autologous plasma group	Steroid group
Baseline (before treatment)	7.2 ± 1.9	6.8 ± 1.8
3 months after treatment	3.8 ± 2.3	2.7 ± 3.0
P value	< 0.001	< 0.001

Table (4): Generalized linear model parameter estimates of VAS scores over time for both study groups.

Time	Indicator	B (SE)	P value
Baseline (before treatment)	Intercept	6.86 (0.315)	0.000
	Autologous plasma	0.46 (0.449)	0.305
	Steroid	Reference	
2 weeks after treatment	Intercept	2.90 (0.462)	0.000
	Autologous plasma	1.72 (0.661)	0.011
	Steroid	Reference	
1 month after treatment	Intercept	2.27 (0.477)	0.000
	Autologous plasma	2.01 (0.679)	0.005
	Steroid	Reference	
3 months after treatment	Intercept	2.35 (0.501)	0.000
	Autologous plasma	1.22 (0.711)	0.093
	Steroid	Reference	

Discussion

Plantar fasciitis is routinely known to be treated by physiotherapy, foot wears, and corticosteroid intralesional injections. Despite that, plantar fasciitis pain may persist for several weeks. Several authors reported the story of autologous plasma injection success in treatment of tendinopathies which raises the idea of using it in treatment of severe cases of plantar fasciitis[11, 15-17] Therefore, this study was conducted to confirm that intralesional autologous plasma injection is an effective method for treating plantar fasciitis and whether its effect is comparable to that of local steroid injection.

Similar to what is reported by Lee,12 and Tiwari *et al*, 18 the current study reported that corticosteroid group had very good immediate response better than the autologous plasma injection group. At 3 months post injection no significant differences were reported between the two groups. This is unlike the findings reported by Lee *et al*12 and Yaratapalli *et al*19 who found that corticosteroid group had significantly lower VAS than the autologous plasma injection group at 3 months. Similar to what is reported by Akashin *et al* 15, Lee,12 and Tiwari *et al*,18 both groups in current study showed significantly lower mean VAS scores over time when compared with pre injection scores.

Long term use of autologous plasma injection found to be more effective and durable than corticosteroid injection in treatment of chronic severe plantar fasciitis. 20 In this study autologous plasma injection leads to gradual reduction in pain scoring which is kept constant until 3 months post injection. This is similar to what is reported by Lee *et al* [12] and Yaratapalli *et al* [19] who found that autologous plasma injection keep constant reduction in VAS till 6 months post injection.

Conclusion: In conclusion, both methods are effective and successful in treating plantar fasciitis. Autologous plasma can provide successful alternative treatment of severe chronic plantar fasciitis in patients who have failed to respond to traditional non-operative management techniques. When corticosteroid injection therapy has failed, contraindicated, or unacceptable to patients because of the poor reputation of corticosteroids and the complications associated with its use, Autologous plasma injection seems to be safer and at least having same effectivity in the treatment of plantar fasciitis.

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