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Original Research Article

A comparative study between single dose intralesional autologous blood and corticosteroid injection in chronic plantar fasciitis-a short term follow-up study

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ABSTRACT

Background: Plantar fasciitis was initially thought to be an acute inflammatory disease, but histology findings show that it is a chronic degenerative process leading to pain at the calcaneal insertion without any inflammation. The diagnosis of plantar fasciitis is mainly based on clinical symptoms, like heel pain and tightness, and diagnostic imaging is not routinely required. Injection of autologous blood can help stimulate a healing response in chronic tendon disorders.
Methods: Radiological imaging of the affected foot in lateral view will be taken. 30 patients will be treated with 2 ml of autologous blood with 1 ml lidocaine and another 30 patients with 2 ml of triamcinolone acetonide with 1 ml lidocaine. The main outcomes measured are subjective based on the visual analog scale done pre-injection, 2 weeks, 4 weeks and 12 weeks post injection. Final outcome was measured based on the pain and activity level at 3 months.
Results: The corticosteroid group showed an early sharp and then more gradual improvement in pain scores, but autologous blood group had a steady gradual drop in pain.
Conclusions: Autologous whole blood and corticosteroid local injection can both be considered as effective methods in the treatment of chronic plantar fasciitis.

Keywords: Chronic plantar fasciitis, Intra-lesional injection, Autologous blood, Corticosteroid, Heel spur, Visual analogue scale, Nirschl stage

INTRODUCTION

Plantar fasciitis, which is usually described as an overload of the plantar fascia is the most common cause of heel pain in adults.[1,2] Degeneration and inflammation coexist in chronic plantar fasciitis. It is one of the most prevalent chronic tendinopathies affecting people. It commonly affects both men and women between the ages of 40 and 70, with women being the most affected.[1] It affects 10% of the general population and is bilateral in 33% of instances. The plantar fascia contributes to the maintenance of the longitudinal arch of the foot. In order to maintain the arch, it is put under tension while the foot carries weight normally. The plantar fascia carries 14% of the load on the foot, according to a biomechanical study model.[2] In a different cadaver investigation, the plantar fascia only ruptured under weights of up to 1189 newtons.[2] This failure most frequently happened at the calcaneal proximal attachment location. Treatment options include rest, ice compression, stretching exercises, non-steroidal anti-inflammatory drugs, extracorporeal shock wave therapy, injections and surgery.[3-5] Numerous studies show the relative benefits and drawbacks of various substances.[6-8] Hence, a comparative study between single dose autologous blood versus steroid injection for chronic plantar fasciitis was performed.

METHODS

This comparative study was done in Rajarajeswari Medical College and Hospital during the period of January 2021-June 2022 in the department of orthopaedics. 60 patients entered the study with 30 patients in each group. The patients were selected according to our inclusion and exclusion criteria and diagnosis made on clinical examination alone. The pain status was noted on the visual analog scale and the activity level noted based on the Nirschl stage. The patients were followed at 2-, 4- and 12-weeks post-injection and the pain and activity level noted. The final outcome was based on our scoring system based on the pain status and the activity level at the end of 12 weeks duration and graded into 4 categories as excellent, good, and acceptable and poor. X-ray ankles of the patients were also taken to calculate the incidence of heel spur in chronic plantar fasciitis.

Patients with age more than 18 years, unilateral heel pain >6 weeks, patients who have undergone conservative treatment with oral analgesics, foot wear modifications and physiotherapy modalities for >4 weeks with no improvement, normotensive and normoglycaemic patients were included in the study.

Patients with bilateral heel pain, not willing for follow up, patients with other medical illnesses and those who have already undergone previous local injections have been excluded from the study.

Statistical software namely statistical package for the social sciences (SPSS) 22.0 and R environment version 3.2.2 were used for the analysis of the data.

RESULTS

The average VAS and Nirschl scores in both the groups pre-injection, 2-, 4- and 12-weeks post-injection were acquired.

The VAS score in the autologous blood group decreased by 1.98 and the Nirschl score decreased by 1.96 in the 12th week compared to pre- injection scores.

Whereas, the VAS score in the steroid group decreased by 2.52 and the Nirschl score decreased by 2.33 in the 12th week compared to pre-injection scores.

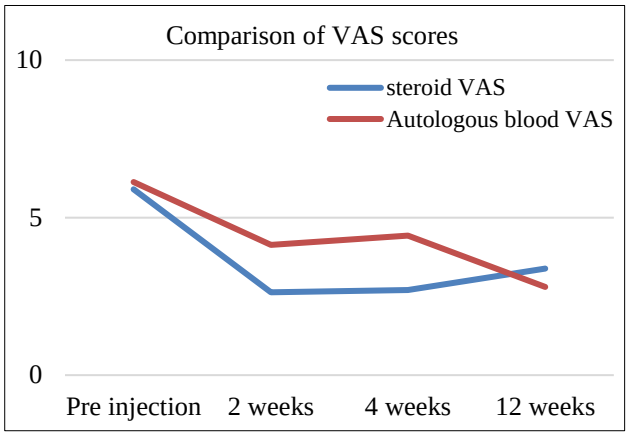

Figure 1: Comparison of vas scores in steroid and autologous blood groups.

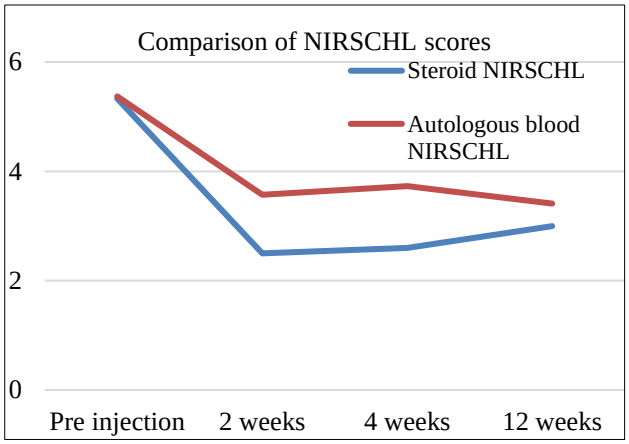

Figure 2: Comparison of Nirschl scores in steroid and autologous blood groups.

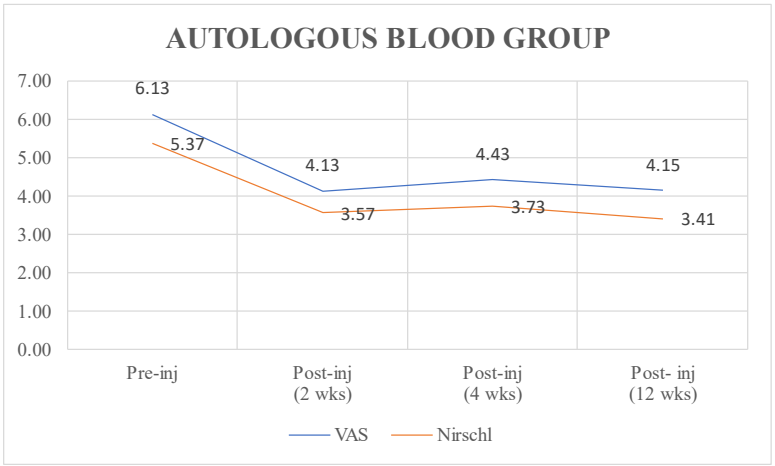

Figure 3: Pain relief assessment in autologous blood group using VAS and Nirschl scoring.

Table 1: VAS and Nirschl scores at pre-injection, 2 weeks, 4 weeks and 6 weeks post injection of autologous blood.

Pre-injection		Post-injection (2 weeks)		Post-injection (4 weeks)		Post-injection (12 weeks)	
VAS	Nirschl	VAS	Nirschl	VAS	Nirschl	VAS	Nirschl
6.13	5.37	4.13	3.57	4.43	3.73	4.15	3.41

Table 2: VAS and Nirschl scores at pre-injection, 2 weeks, 4 weeks and 6 weeks post injection of steroid.

Pre-injection		Post-injection (2 weeks)		Post-injection (4 weeks)		Post-injection (12 weeks)	
VAS	Nirschl	VAS	Nirschl	VAS	Nirschl	VAS	Nirschl
5.90	5.33	2.63	2.50	2.70	2.60	3.38	3.00

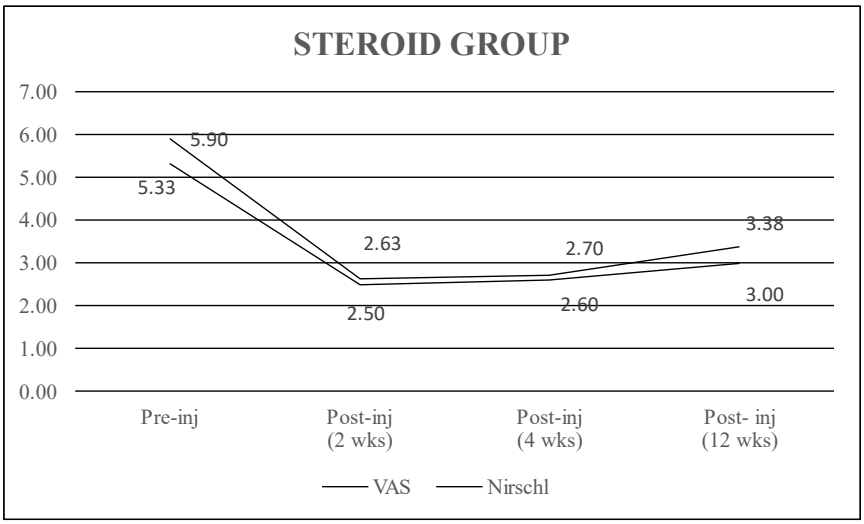

Figure 4: Pain relief assessment in steroid group using VAS and Nirschl scoring.

From the above figures, it is clear that the autologous blood group followed a gentle curve during the 2 weeks after injection compared to that of the steroid curve. At the end of 12 weeks, the effect is still sustained shown by its down coming curve pattern.

Also, it is clear that the steroid group had a steep curve during the 2 weeks after injection compared to that of the autologous blood group curve. At the end of 12 weeks, the effect has weaned off shown by its up going curve pattern.

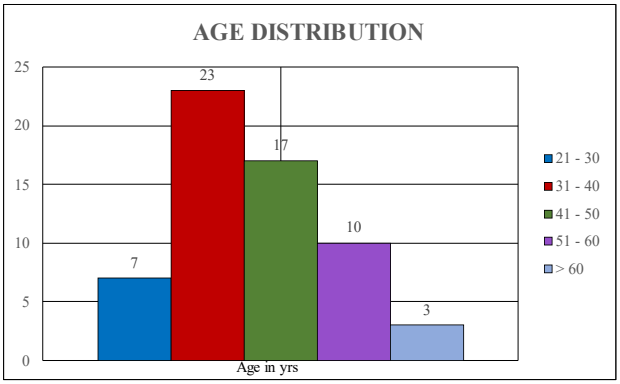

Figure 5: Age distribution of patients.

There were 17 males and 43 females with a mean age of 43.2 years. Range was age 23-69 years.

DISCUSSION

From the results extrapolated in the graph as discussed before, the autologous blood group had a descending/down coming curve pattern at the end of 3 months, whereas the steroid group had an ascending/up going curve pattern. This is due related to a late and sustained beneficial effect of autologous blood. Steroid injections provide faster and better relief of pain compared to autologous blood, but the beneficial effect is only short lived.

Chi-square/Fisher exact test has been used to find the significance of study parameters on categorical scale between the two groups.

The p value of the results in my study was 0.253 through fisher exact test and the results were not significant for the given time period

Martin et al studied the effect of intra-lesional autologous blood injections in chronic plantar fasciitis in over 200 patients and reported good results nearing 80%.

Corticosteroids inhibit the fibroblast proliferation and the release of ground substance proteins.[16,17]

The literature also supports the effectiveness of corticosteroid injection for plantar fasciitis treatment on a short-term and long-term basis.[18,19]

In our study, in the autologous blood group, 11.1% had good and 88.8% had acceptable outcomes.

It was Dr. Barrett who initially tried autologous blood injections for plantar fasciitis with good results.[9]

In our study, in the steroid group, 23% had good, 65% had acceptable and 7% had excellent outcomes.

In our study, 1 patient in the steroid group had poor outcome and was advised another intra-lesional injection of the same substance.

Table 3: Outcomes.

Outcome	Group B (%)	Group S (%)	Total (%)
Average	24 (80)	17 (56.7)	41 (68.3)
Excellent	0 (0)	2 (6.7)	2 (3.3)
Good	3 (10)	6 (20)	9 (15)
Poor	0 (0)	1 (3.3)	1 (1.7)
Lost follow-up	3 (10)	4 (13.3)	7 (11.7)
Total	30 (100)	30 (100)	60 (100)

The current study was done on 60 patients for a duration of 3 months and at the end of 3 months the average pain relief for the patients was arguably similar. Further study on pain relief for longer follow up duration on a bigger study group is expected to give concrete results and eliminate the limitation of this study.

CONCLUSION

We conclude that in chronic plantar fasciitis local intra-lesional steroid injection gives better pain relief and faster return to activities of daily living compared to autologous blood injections. Autologous blood injections also provide pain relief, although not comparable to steroids in the speed of recovery, but produces sustained effects and are easily available with no potential risk.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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