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AUTOLOGOUS BLOOD INJECTIONS: A LESS FANCY BUT MORE COST-EFFECTIVE METHOD TO TREAT PLANTAR FASCITIS

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ABSTRACT

Plantar fasciitis is the inflammation of planter fascia, deep fascia over the foot bones and tendons. Plantar fasciitis is common cause of heel pain and often difficult to treat in its most chronic and severe forms. It is usually subsides itself. Most commonly used conservative treatments include rest, analgesics, anti-inflammatory medications, use of orthotic devices, stretching and physiotherapy. Local injection of steroids, platelet rich plasma and autologous blood can be injected if conservatively symptoms not subside. In this study we have studied the Role of Autologous whole blood injections for patient with planter fasciitis in outdoor basis and then comparing the results with other studies using treatment modalities like local corticosteroid injections and autologous platelets concentrates (APCs)/Platelets rich plasma (PRP) injections on the basis of efficacy, safety and economy. This study was carried out between January 2014 and October 2014. In study, 100 adult patients were selected with planter fasciitis on outpatient basis and given local autologous whole blood. They were followed at 3 weeks, 6 weeks, 3 months and 6 months for assessment. VAS score and Rearfoot scores measured before treatment, at 3 wks, 6 wks, 3 months and 6 months. In our study mean VAS score in patients treated with autologous whole blood injections decreased significantly from 7.8 to 2.9 and Rearfoot score increased from 46 to 83. Autologous whole blood injections are not only as efficacious as local steroid injections and platelet rich plasma but also they are safer than steroid injections and much more cost effective as compared to platelet rich plasma. They become an excellent out-patient tool for the management of plantar fasciitis. It can be easily given in OPD basis.

Key words: Plantar fasciitis, Rest, Analgesics, Anti-inflammatory.

INTRODUCTION

Planter fasciitis is common cause of heel pain. Plantar fasciitis is characterized by a painful inflammatory process involving plantar fascia, causing pain on the heel. It is inflammatory condition generally caused by overuse, injury or biomechanical abnormalities and may be associated with micro tears or fibrosis. It is usually subside itself. It is primarily treated conservatively which include rest, analgesics, anti-inflammatory medications, use of orthotic devices, and physiotherapy. Local injection of steroids, Platelets rich plasma and Autologous blood can be injected. Rarely Extracorporeal shockwave therapy and surgery to release the plantar fascia from the bone or to relieve muscular tightness are sometimes for patients with refractory symptoms.

Use of orthobiologics for plantar fasciitis is the new kid in the town and it claims to promote healing

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through the action of growth factors. It can be used either as autologous whole blood or platelet-rich plasma.

The aim of study was to determine the efficacy, safety and economy of Autologous whole blood injections in patient with planter fasciitis and then comparing the results with other treatment modalities like local corticosteroid injections and autologous platelets concentrates (APCs)/Platelets rich plasma (PRP) injections on the basis of efficacy, safety and economy.

METHODS AND MATERIALS

This is a prospective study which was carried out between January 2014 and October 2014. In the study 100 adult patients were selected with planter fasciitis on outpatient basis.

The disease, planter fasciitis, was diagnosed clinically and radiologically (x-ray calcaneum lat view). Clinically these patients were presented with gradual, insidious onset sharp localized pain at plantar fascial origin. Pain usually worsened in morning, eased with gentle activity, increased as day passed by and was aggravated by stair climbing, use of high heel shoes, running, jumping, or "Barefoot" activities [2]. The key physical finding was central or centro-medial tenderness in the plantar aspect of the heel.

Our inclusion and exclusion criteria for selection in study were below.

Inclusion criteria

-Age>18

- Refractory to conservative treatments (include rest, analgesics, anti-inflammatorymedication, use of orthotic devices, eccentric exercise, stretching and physiotherapy) for 6 weeks.

Exclusion criteria

-Age<18

-Patients not taken conservative treatment

-Patients who had taken local steroid inj. <3 months

-Previous surgery for planter fasciitis

-Vascular insufficiency, neuropathy.

-Active B/L planter fasciitis

-pregnancy

The selected 100 patients were given local autologous whole blood on OPD basis. Autologus blood was injected in the following manner. Under aseptic precaution 10 ml whole blood collected in sterile syringe from ante cubital vein and injected within 5 min in heel at most tender point(at origin of planter fascia generally) with a 'peppering' technique which involves inserting the needle into the fascia, injecting some of the blood, withdrawing without emerging from the skin, slightly redirecting and reinserting.

After injection, no specific physiotherapy or splintage was given. All patients were advised to wear soft slippers and take contrast bath (also known as "hot/cold immersion therapy", is a form of treatment where the foot is immersed in ice water followed by the immediate immersion of the foot in warm water, alternating every 5 minutes) twice a day. Patients were also given NSAIDS as analgesics for post injection pain relief for 3days. They were followed at 3 weeks, 6 weeks, 3 months and 6 months for assessment. VAS score measured before treatment, at 3 wks, 6 wks, 3 months and 6 months. At follow up, if patients did not have a pain relief of more than 25%, the injection was repeated every 3 weeks, up to a maximum of 3 injections, or more than 25% pain relief to the patient, whichever was earlier.

OBSERVATIONS AND RESULTS

This prospective study consists of 100 patients of planter fasciitis treated with autologous whole blood injections. The data analysis of these patients as, the materials for the study was analyzed to the following findings.

Age group	No of patients with planter fasciitis
18-30	12
30-50	44
50-70	29
>70	15
Total	100

Most of the cases were between 30 and 50 years of age (44%). 73% of patients were between 30 and 70 years old.

Gender	No of patients with planter fasciitis
Male	41
Female	59
Total	100

The number of females (59) has outnumbered the males (41) by 18%.

BMI (Body Mass Index)	No of patients with planter fasciitis
<20	07
20-25	11
25-30	47
30-35	32
>35	03

82% of the cases were from the population which was overweight, obese, or morbidly obese. (BMI >25). There was a statistically significant high in the number of patients of plantar fasciitis with a BMI more than 25. [$p<0.0001$]

In our study, assessment were done with VAS score (visual analogue scale from 0–10,with 0 indicating no pain and 10 the worst imaginable pain)and Rearfoot scores(scale 0–100 with higher scores indicating less pain and better function) at 3 wks, 6wks, 3months and 6months.

Treatment	Mean VAS score (0-10)
Pre-Injection	7.8
At 3 weeks	4.9
At 6 weeks	3.6
At 3 months	3.1
At 6 months	2.9

The mean VAS score has reduced with time, this is negative correlation [Pearson correlation coefficient=-4.7] and this was significant [p=0.028]

The proportion of patients with no change in score was 5%.

Treatment	Mean Rearfoot scores(0-100)
Pre-injection	46
At 3 weeks	63
At 6 weeks	71
At 3 months	80
At 6 months	83

The mean Rearfoot scores has increased with time, this is positive correlation [Pearson correlation coefficient = 5.37] and this was significant [p=0.015]

DISCUSSION

Plantar fasciitis is the most common cause of foot pain, affecting 8% of the Indian population. They constitute the major chunk of orthopaedic OPDs across the country after osteoarthritis and backache. There are many treatment options available for the treatment of plantar fasciitis including local steroid injections, PRP injections, extracorporeal shockwave therapyand surgical methods like plantar fasciotomy. These treatment modalities vary to a great extent in their efficacy, safety, and cost. So we must be armed with a modality which is as efficacious as the above modalities, which is cost effective, which can be administered daily on an opd basis without causing much discomfort to the patient and which is safe. Autologous blood injection seems to be an answer to all the above mentioned requirements.

Autologous whole blood injections carry several growth factors and growth factors play an integral role in the natural process of healing. They promote the inflammatory response allowing the completion of 1st phase and progression to the next. In phase1, bleeding into the area of injury causes platelet aggregation then coagulation so as to prevent excessive bleeding and to release growth factors. There is an increase in vascular permeability, initiation of angiogenesis, chemotactic migration of monocytes and macrophages, and induction of fibroblasts to synthesize collagen and extracellular matrix.

The peak incidence of heelPain occurs between ages 30 and 50, which is our working population.

It is also more common in females, most probably because most of the females of our country are housewives. They stand for long periods cooking, squat while washing clothes, and they are almost always bare foot in the house. Wearing high heels when they go out makes them more vulnerable to plantar fasciitis. In our study, the proportion of females with plantar fasciitis was significantly higher than in males.

In our study, 82% of the cases were from the population which was overweight, obese, or morbidly obese. (BMI > 25). There was a statistically significant high in the number of patients of plantar fasciitis with a BMI more than 25. [p<0.0001] Hence, we can say that obesity is a risk factor for plantar fasciitis, most probably because more weight on the origin of plantar fascia leads to more inflammation.

The selected 100 patients were given local autologous whole blood on OPD basis with a 'peppering' technique which involves inserting the needle into the fascia, injecting some of the blood, withdrawing without emerging from the skin, slightly redirecting and reinserting. The advantage of injecting in such a way is that it most probably it allows greater spread of the autologous blood hence better healing. Besides injecting 10 ml blood at a single spot would create tension in the plantar fascia and its compartments, thereby aggravating pain.

After injection, no specific physiotherapy or splintage was given to allow full mobility to the patient. All patients were advised to wear soft slippers and take contrast bath, not neglecting the standard precaution and proven therapy. Patients were also given NSAIDS as analgesics for post injection pain relief for 3 days. They were followed at 3 weeks, 6 weeks, 3 months and 6 months for assessment. VAS score and Rear foot scores were measured before treatment, at 3 wks, 6 wks, 3 months and 6 months. At follow up, if patients did not have a pain relief of more than 25%, the injection was repeated every 3 weeks, upto a maximum of 3 injections, or more than 25% pain relief to the patient, whichever was earlier.

In our study mean VAS score in patients treated with autologous whole blood injections deceases significantly from 7.8 to 2.9 over 6 months and Rearfoot score increase from 46 to 83. Most of the pain relief occurred within the first 6 weeks of therapy. (mean 7.8 to mean 2.9). Almost negligible relief was seen (3.6 to 2.9) after 6 weeks over 6 months. If 25% pain relief was not seen at 3 weeks, a repeat injection was administered. Hence, apparently there was no benefit of more than 2 injections.

The results of our study were compared with results with other treatment modalities.

Akashinet al completed a prospective non randomized Comparison of PRP and corticosteroid injection for plantar fasciitis. Sixty patients who had failed 3 months of conservative care were treated in 2 consecutive groups of 30each with either 40 mg methyl prednisolone or 3 ml of PRP and were followed up for 6 months after treatment. The mean VAS scores dropped

from 6.2 to 3.2 in the steroid group and 7.33 to 3.93 in the PRP group at 6-month follow-up. The authors concluded that while both treatments appeared effective, PRP injection appeared to be the safer of the two but treatment with PRP needs costly instruments and trained man power. Unlike corticosteroid injection, risks of plantar fascia rupture and soft tissue atrophy have not been seen in PRP injections. The mean reduction in VAS score in our study was 4.9 while in Akashin et al study the mean reduction was 3.4. Our study has shown higher reduction than Akashin et al who used costly PRP. This difference was statistically significant [$p<0.001$, $z=7.2$].

In a non blinded, uncontrolled, prospective preliminary study, Martinelli at el used PRP to treat a group of 14patients with chronic plantar fasciitis. Three weekly injections were given and the patients were followed up for 12months. Average VAS scores decreased from 7.1 to 2.1. The mean reduction in VAS score in the study of Martinelliet all was 5.0, which was comparable to our study [4.9]; this difference was not significant [$p=0.72$, $z=0.35$]

Thus PRP injections are expensive, with no added benefits than autologous blood injections. Moreover, the whole blood carries all the factors present in PRP, and since the injections are not given in the joint, there is no risk of cartilage damage.

Besides, local steroid injections always carry the risks of tendo-achilis rupture and infections in local side. There are no such risks associated with autulogous blood injections, while not compromising on the efficacy.

CONCLUSION

Autologus whole blood injection for patient with planter fasciitis is same effacious as compared to local corticosteroid injection but autologous blood injections are more safe and cost effective as compare to local corticosteroid injection. It can be easily given in OPD basis.

REFERENCES

1. Donley BG, Moore T, Sferra J, Gozdanovic J, Smith R. The efficacy of oral nonsteroidal anti-inflammatory medication (NSAID) in the treatment of plantar fasciitis, a randomized, prospective, placebo-controlled study. *Foot Ankle Int*, 28(1), 2007 20-3.
2. CRAIG C. YOUNG. Medical College of Wisconsin, Milwaukee, Wisconsin DARIN S. RUTHERFORD, Mercy Sports Medicine, Janesville, Wisconsin MARK W. NIEDFELDT, Medical College of Wisconsin, Milwaukee, Wisconsin. *Am Fam Physician*, 63(3), 2001, 467-475.
3. Martinelli N, Marinozzi A, Carnì S, Trovato U, Bianchi A, Denaro V.Platelet-rich plasma injections for chronic plantar fasciitis. *Int Orthop*, 37(5), 2013, 839-42.
4. Crawford F, Atkins D, Young P, Edwards J. Steroid injection for heel pain, evidence of short-term effectiveness. A randomized controlled trial. *Rheumatology*, 38, 1999, 974–977.
5. Acevedo JI, Beskin JL. Complications of plantar fascia rupture associated with corticosteroid injection. *Foot Ankle Int*, 19, 1998, 91–97.
6. Akashin E, Dogruyol D, Yuksel HY, et al. The comparison of the effect of corticosteroids and platelet-rich plasma (PRP) for the treatment of plantar fasciitis. *Arch Orthop Trauma Surg*, 132, 2012, 781–785.
7. Martinelli N, Marinozzi A, Carni S, et al. Platelet-rich plasma injections for chronic plantar fasciitis. *Int Orthop*, 19, 2012,
8. S1432–S5195.
9. Gerdesmeyer L, Frey C, Vester J*et al* Radial extracorporeal shock wave therapy is safe and effective in the treatment of chronic recalcitrant plantar fasciitis, results of a confirmatory randomized placebo-controlled multicenter study. *Am J Sports Med*, 36(2), 2008, 100–2,109.
10. Riddle DL[1], Pulisic M, Pidcoe P, Johnson RE. Risk factors for plantar fasciitis, a matched case-control study. *J Bone Joint Surg Am*, 85-A(5), 2003, 872-7.
11. Autologous blood injection for tendinopathy Issued, January 2013. NICE interventional procedure guidance 438. guidance.nice.org.uk/ipg438
12. NICE interventional procedure guidance 438 guidance.nice.org.uk/ipg438.
13. Leach R, Jones R, Silva T. Rupture of the plantar fascia in athletes. *Bone Joint Surg Am*, 60, 1978, 537–539.