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Effect of Platelet Rich Plasma Versus Steroid Infiltration on Planter Fasciitis

Priyanshu Pandey¹, Nitin Samal², S. S. Khedkar³

¹Junior Resident, Department of Orthopaedics, Jawaharlal Nehru Medical College, Datta Meghe Institute of Medical Sciences, Sawangi, Wardha, Maharashtra, India; ²Associate Professor, Department of Orthopaedics, Jawaharlal Nehru Medical College, Datta Meghe Institute of Medical Sciences, Sawangi, Wardha, Maharashtra, India; ³Professor, Mechanical Engineering, Yeshwantrao Chavan College of Engineering, Nagpur, Maharashtra, India.

ABSTRACT

Background: Plantar fasciitis (PF) is an overuse injury that seriously affects the patient's daily activities and quality of life. Plantar fasciitis is often unclear and may be multifactorial because of high incidence in runners it is best populated to be caused by repetitive microtrauma. Risk factors include obesity, an occupation requiring prolonged standing and weight-bearing. Primarily it is a clinical diagnosis and a self-limited condition in the majority of patients. It takes months and years to resolve; thus poses challenges to treating clinicians.

Methods: The study was conducted over 1 year in the department of orthopaedics JNMC Sawangi. The study population included patient diagnosed with plantar fasciitis clinically and radiologically. Total 30 patients were included in this study which was divided into 2 groups randomly group A and group B for PRP and local corticosteroid injection.

Expected Results: Result will be summarized as-Number of cases included for analysis, sex distribution of study participant, sex ratio, prevalence among male and female, the age distribution of participants, socioeconomic status.

Key Words: PRP, Corticosteroid, Plantar fascia

INTRODUCTION

Plantar fasciitis is a typical neurotic condition influencing the rear foot, and can frequently be a test for doctors to treat effectively.^{1,2} It is an abuse injury-causing aggravation at the source of the plantar sash and encompassing peri fascial structures, for example, the calcaneal periosteum.³⁻⁶ Inferno average heel torment is the most normal clinical issue in adults.⁷⁻¹⁰ Plantar fasciitis (PF) is normally observed as an abuse injury in competitors, sprinters specifically¹¹ (representing almost 10% of running wounds), but at the same time is found in the general population.¹²⁻¹⁴ A portion of the components as often as possible accepted to encourage PF to incorporate atypical foot biomechanics and additionally foot types, ill-advised footwear, and obesity.¹⁵⁻²⁰ All the more explicitly, foot over-pronation is accepted to put an expanded strain on the plantar delicate tissues and make the potential for injury to occur.²¹ Despite the absence of comprehension of the reasons for PF, most creators concur that it is a self-constraining condition in by far most of the cases and that medical procedure isn't the treatment of choice.²² Roughly

95% of those with PF will have goals of their side effects in six to eighteen months.²³ The backbone of treatment for intense and interminable PF remains non-usable because moderate strategies are effective in over 90% of patients.²⁴ Three classifications for nonsurgical administration of plantar fasciitis: lessening torment and aggravation, diminishing tissue worry to an average level; and reestablishing muscle quality and adaptability of included tissues.²⁵ Platelet-rich plasma (PRP) discharges high centralizations of platelet determined development factors that upgrade wound recuperating, bone mending and ligament mending. At the point when platelets become actuated, development factors are discharged and start the body's common mending response.²⁶⁻²⁹ Development factors intercede the organic procedures fundamental for the fix of delicate tissues, for example, ligament, muscle, ligament and tendon after intense awful, or abuse injury. PRP is gotten from the centrifugation of autologous entire blood and contains platelets fixation that is 3 to multiple times higher than that of typical entire blood.^{30,31}

Corresponding Author:

Priyanshu Pandey, Department of Orthopedics, Jawaharlal Nehru Medical College, Datta Meghe Institute of Medical Sciences, Sawangi, Wardha, Maharashtra, India; Contact: 8237133769; Email: priyanshup94@gmail.com

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Objectives

- To study and compare the efficacy of PRP infiltration in patients with plantar fasciitis.
- To study the efficacy of steroid infiltration in patients with plantar fasciitis
- To compare the effect of PRP vs. steroid infiltration in patients with plantar fasciitis.

MATERIALS AND METHODS

This Randomized control trial will be conducted at AVBRH, a tertiary care, rural hospital located in central India after the institutional ethical committee has approved this study. Participants: Patient of plantar fasciitis would be diagnosed. Diagnosis will be confirmed by ultrasonography finding with thickness more than 4mm. Following patient are included in the study;

Inclusion criteria

- Age of subject is 20-60 yr of both genders.
- Patients with plantar fasciitis for more than 3 months.
- Patients without any deformity (structural).
- Normal random blood sugars. (Including HbA1c in normal limits)

Exclusion criteria

1. Patients with Rheumatoid arthritis.
2. Any fractures or injury around the ankle or knee.
3. Patients with the bone tumour, infection.
4. Patients with a history of corticosteroid injection past two months.
5. Patients with Hemorrhagic disorder.
6. Age group for less than 20 years and over 60 years.

The patient attending OPD will be screened for the eligibility criteria. The participants meeting the set criteria would be explained about the nature and purpose of the study. Written and informed consent will be taken from those willing to participate in the study. The would-be ensured confidentiality.

Procedure

After taking clearance from the ethical committee, the patient will be selected according to the inclusion and exclusion criteria. Informed written consent will be taken from every patient who agrees to follow instruction and recommendation given by the clinician. Patient biography, detail history and clinical examination will be done along with the ultrasonographically guided thickness of plantar fascia of feet 0th day, 2 weeks, 4 weeks and follow up will be taken on 8 weeks.

Interventions

Corticosteroids Injection

Corticosteroids exert its anti-inflammatory effect by lipocortin-1 synthesis. Lipocortin-1 inhibits phospholipase A2

thereby preventing the formation of prostaglandins and leukotrienes which are primary mediators of inflammation. It also inhibits various inflammatory events like white blood cell migration, chemotaxis, phagocytosis, etc. Role in chronic plantar fasciitis: anti-inflammatory role of corticosteroids may not play a part here except in acute conditions. But the beneficial effect of corticosteroids in this condition seems to exist for a long time. Corticosteroids are known to inhibit the proliferation of fibroblasts and to decrease the synthesis of ground substances. The beneficial effect of steroid injection may be due to the above action rather than its anti-inflammatory role.

Injection of steroid is made after palpating the area of maximum tenderness. It is usually injected in combination with a local anaesthetic agent to tolerate the immediate post-injection pain. Advantages are it is very effective, Even single injection may bring about resolution of the condition. cost-effective, Do not need expensive equipment's. The disadvantage is it an invasive procedure, Cannot be done in patients with uncontrolled diabetes/hypertension, Side effects are common which includes plantar fascial rupture, fat pad necrosis. Commonly used preparations: 2 types of corticosteroids are used for the treatment of chronic inflammatory musculoskeletal conditions. 1. Methylprednisolone acetate (moderately insoluble, long-acting) and 2. Fluorinated hydrocortisone i.e. Betamethasone, Dexamethasone, etc (highly soluble, short-acting). Methylprednisolone acetate has 5 times the glucocorticoid action of prednisolone and is 1.25 to 1.5 times stronger than prednisolone. Betamethasone is 8 to 10 times potent than prednisolone.

Autologous blood injection

This is the injection of the affected tissue with the patient's blood in small quantities. This is a relatively newer technique and has become an alternative to corticosteroid injections in recent times. Autologous blood injection was initially done by Edwards and Calandruccio in 2004 for tennis elbow with a good outcome. It was gradually extended for other tendinopathies and chronic inflammatory conditions. Mechanism of action for autologous blood, when injected into an area of inflammation/degeneration, tends to provide cellular/humoral mediators and growth factors. These growth factors tend to recruit stem cells and results in collagen synthesis and repair of the degenerated tissues resulting in healing. Mode of injection is around 2 ml of venous blood of the patient is drawn and mixed with 1 ml of a local anaesthetic and injected into the area of maximum tenderness. Advantages are no chance of reaction as the patient's blood is injected, cost-effective, no need for expensive equipment. Disadvantages are like may take a long time to act, Patient may not accept it.

Platelet rich plasma injection

Mechanism of action is similar to that of autologous blood, but here the same effect is brought about by centrifuged platelet-rich plasma rather than the administration of whole blood. Advantages are that no reaction to the injected substance. Disadvantages are needs centrifugation apparatus, need more quantities of blood to be drawn, may need multiple injections, the patient may need to restrict activities for a few weeks.

Variables (Endpoints)

1. Ultrasound Imaging Machine Measurement of the cross-sectional area of plantar fasciitis will be done using a linear probe of Aloka Hitachi S70
2. American Orthopaedic Foot and Ankle Society Scale
3. Numerical pain rating scale (NPRS)
4. Visual analogue scale (VAS)
5. Foot health status questionnaires. (FHSQ).

Follow up will be at 2,4,6 weeks

Bias: intervention is such that it is not possible to blind the participant and personal this might create bias.

Study size: 30 patient

Quantitative variables; plantar fascia thickness, weight, height, BMI

Statistical methods: will be evaluated as ssps6

EXPECTED OUTCOMES/RESULTS

The result will be summarized as Number of cases included for analysis, sex distribution of study participant, sex ratio, prevalence among male and female, the age distribution of participants, socioeconomic status.

DISCUSSION

As per a comparative study of functional outcome between platelet-rich plasma injection³² versus steroid infiltration in plantar fasciitis, there is no significant difference in VAS and FADI score between corticosteroid injection and PRP injection at 1, 3 and 6 months follow up. So, they were determined to be equally effective in Plantar fasciitis. Since PRP injection was found to be more time consuming and more costly. Hence, corticosteroid seems to be a better option. Few of the Bone and joint pathologies related studies were reported.^{32,33}

CONCLUSION

Platelet-rich plasma can be more effective in the management of Plantar Fasciitis.

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