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COMPARATIVE STUDY OF PLATELET-RICH PLASMA AND CORTICOSTEROID INJECTION IN THE TREATMENT OF PLANTAR FASCIITIS

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Abstract:
Background: Plantar fasciitis is defined as localized inflammation due to chronic repeated microinjury to the substance of plantar aponeuroses and the patients present to the clinic for pain in heel. In this study, autologous platelet-rich plasma (PRP), a concentrated bioactive blood component rich in growth factors, was compared to traditional steroid injection usually methylprednisolone in the treatment of plantar fasciitis resistant to traditional nonoperative management.
Methods: Eighty patients with plantar fasciitis were included in the study and randomly categorised into group A (steroid inj) and Group B (prp inj). 3 cc PRP or 40 mg DepoMedrol injected into plantar aponeurosis at maximum point of tenderness, in both groups separately. Results of both groups comparedand Score of both the groups tellied by using vas score.
Study Design and Time: Prospective cohort study of 6 months duration.
Inclusion criteria: All cases of plantar fasciitis except cases of metabolic disorder
Exclusion criteria: other plantar pathologies and deformities. calcaneum fractures Old treated with injections.
Results: The instillation of PRP found to be more effective than Steroids injection in terms of pain and functional results in the treatment of plantar fasciitis. Clinical evaluation was performed before treatment and at the 6th week, 12th week and 24th weeks from instillation of PRP/steroid in follow up visits. Visual analog scale were used in the clinical evaluation.
Keywords: Platelet-Rich, Plasma, Corticosteroid, Plantar & Fasciitis.

Introduction:

Plantar fasciitis (PF) is an overuse injury that seriously affects the patient's daily activities and quality of life. Primarily it is a clinical diagnosis and a self-limited condition in majority of patients. It takes months and years to resolve; thus poses challenges to treating clinicians.[1] Plantar fasciitis affects both sedentary and physically active individuals like athletic and military personnel's and are believed to arise from chronic overload, alignment or weakness issues either from lifestyle or exercise. The etiology is poorly understood and is unknown in nearly 85% of cases. 1 While there are a plethora of treatment options, none of these are universally reliable or acceptable.[2] Conservative therapies are usually the first line of treatment includes ice, rest and avoidance of potentially strenuous activities, physical therapies, orthotics, arch supports, tapping and splinting.[3] Other modalities include use of NSAIDS, ultrasonic Shockwave therapy, and, in the recalcitrant cases, surgery. Corticosteroid injection is a mainstay of early treatment. However, conflicting evidence exists to support the use of steroid injection.[4] Platelet rich plasma (PRP) therapy is a revolutionary novel modality thatrelieves pain by stimulating long lasting healing of musculoskeletal conditions. 2-4 This clinical study was thus undertaken in patients of chronic planter fasciitis, to evaluate and compare the effectiveness of single injection of autologous platelet rich plasma (PRP) and steroid injections.[5,6]

METHOD:

The study was designed as a single centre prospective controlled randomized research. The present research was approved by institutional review board, and informed consent was obtained from each subject. The current study recruited untreated patients of heel pain reporting to the Department of Orthopaedic, Traumatology and rehabilitation Index Medical College Hospital and RC Indore MP India from January 2018 to July 2018. A medical and demographic history was taken, and patients were examined.

Inclusion criteria-all participants aged 40-70 years of either sex had to

• Have heel pain for more than 4month and/or have been diagnosed as having Chronic Planter Fasciitis (CPF)

• Ability to walk,

• Subject must understand the risk and benefit of the protocol and be able to give informed consent,

• Availability for the duration of entire study period.

Exclusion criteria-It includes following parameter

• Traumatic heel pain,

• Heel pain less than 4 month,

• Inflammatory disorder like gout, RA, Ankylosing spondylosis etc,

• Abnormal LFT and RFT,

• Hematological disorders or any history of coagulopathies,
• Diabetes,
• Cancer,
• Medically unfit patient,
• Hypersensitivity to NSAIDs,
• Compressive neuropathies,
• Skin disorders,
• Severe infection,

• Pregnant, breast feeding or planning to become pregnant.

Preparation of PRP

VENEPUNCTURE - Collection of around 20 ml blood of whole blood in anti-coagulated vacutainer tubes

↓

FIRST SPIN- transfer of the upper layer with buffy coat to empty sterile tube

↓

SECOND SPIN- collection of platelet concentrates at bottom of the tube

↓

Homogenize platelet concentrates by thoroughly mixing into lower 1/3rd of plasma,discarding upper 2/3rd .

↓

Homogenized PRP is prepaired

PROCEDURE

The procedure was done on out-patients basis under complete aseptic condition
1- Position: The patient lay supine with lower limb externally rotated
2- Disinfection: Skin disinfection with betadine and spirit
3- Aneasthesia: Homogenize platelet mix with 2% of lignocaine
4- Technique: Homogenize platelet and lignocaine mixer injected at site of maximum point of tenderness

Table 1: Comparison of Steroid & PRP Group

	Steroid Group (n=30)		PRP Group (n=30)		P Value
	N	Mean ± SD	n	Mean ± SD	
Age (year)		41.36± 8.82		41.26 ± 8.82	> 0.05
Male/Female	9/21		5/25		>0.05
Affected Heel (Right/ Left)	11/19		14 / 16		>0.05
VAS		6.93 ±1.04		6.96 ± 1.2	>0.05
AHFS		71.86 ± 8.95		71.80± 8.97	>0.05

Table 2: Comparison of Steroid & PRP Group

	Steroid Group (n=30)	PRP Group (n=30)	P Value
	Mean ± SD	Mean ±SD	
		VAS	
Baseline	6.93±1.04	6.96 ± 1.12	>0.05
6th Week	1.26 ± 1.31	3.83 ±0.79	<0.05
12th Week	0.90 ± 1.53	0.76 ± 0.85	>0.05
24th week	1.03 ± 1.77	0.33± 0.71	<0.05
		AHFS	
Baseline	71.86 ± 8.95	71.80 ± 8.97	>0.05
6th Week	96.06 ± 6.64	89.73 ± 5.54	<0.05

12th week	96.00 ± 6.74	98.56 ± 3.74	>0.05
24th Week	95.63 ± 7.60	99.23 ± 2.94	< 0.05

VAS: Visual Analogue Scale AHFS: Ankle Hind Foot Scale

Visual Analog Scale

Visual Analog Scale:										
No Pain										Worst Pain Imaginable
Numerical Rating Scale:										
0	1	2	3	4	5	6	7	8	9	10
No Pain										Worst Pain Imaginable
Verbal Descriptor Scales:										
				None	Mild	Moderate		Severe		
	No Pain		Mild	Discomforting			Distressing		Horrible	Excruciating

Visual Analogue scale is a measurement of pain intensity and generally completed by patients in terms of current intensity in last 24 hours providing a range of score from 0-10 greater score means greater pain intensity. Vas score takes less than 1 minute to complete. The test reliability has been shown to e good but higher among literate patient than illiterate patients.

Ankle Hind Foot Scale

Pain (40 points)
• None – 40
• Mild, occasional. – 30
• Moderate, daily – 20
• Severe, almost always present – 00
Function (50 points)
Activity limitations, support requirement
• No limitations, no support – 10
• No limitation of daily activities, limitation of recreational activities, no support – 07
• Limited daily and recreational activities, cane – 04
• Severe limitation of daily and recreational activities, walker. crutches, wheelchair, brace – 00
Maximum walking distance, blocks
• Greater than 6 – 05
• 4-6 – 04
1-3 – 02
• Less than 1 – 00
Walking surfaces
• No difficulty on any surface. – 05
• Some difficulty on uneven terrain, stairs, inclines, ladders – 03
• Severe difficulty on uneven terrain, stairs, inclines, ladders – 00
Gait abnormality

• None, slight. – 08
• Obvious – 04
• Marked – 00
Sagittal motion (flexion plus extension)
• Normal or mild restriction (30° or more). – 08
• Moderate restriction (150-29°) – 04
• Severe restriction (less than 150) – 00
Hindfoot motion (inversion plus eversion)
• Normal or mild restriction (75-100% normal). – 06
• Moderate restriction (25–74% normal) – 03
• Marked restriction (less than 25% normal) – 00
Ankle-hindfoot stability (anteroposterior, varus-valgus)
• Stable – 08
• Definitely unstable – 00
Alignment (10 points)
• Good, plantigrade foot, midfoot well aligned – 15
• Fair, plantigrade foot, some degree of midfoot malalignment observed, no symptoms – 08
• Poor, nonplantigrade foot, severe malalignment, symptoms – 00

Discussion

Chronic heel pain is a difficult condition to treat. It is well known that pain does not subside quickly, but can resist for several months and result in significantly disability. Platelet rich plasma injection has emerged as a treatment alternative for many musculoskeletal conditions.[7,8]

The method of PRP preparation is based on studies conducted by Crawford F et al who concluded that platelet high spin method results in higher number of growth factors and platelets in the sample, so we adopted this method. The technique of PRP injection (peppering) was based on the studies by et Aziza Sayed Omar al found this method to be very effective.[9,10]

PRP is an efficient way to treat chronic plantar fasciitis when conservative management fails. It is good treatment option compared to other invasive surgical modalities such as fasciotomy as this procedure helps in preserving the anatomy of the foot. PRP is more effective and durable than corticosteroid injection for the treatment of chronic cases of plantar fasciitis.[11]

In the present study, patients were more frequently females (67%), and their mean age was 51 years. The occurrence of plantar fasciitis is related to activities that require the support of body weight. Most patients in the present study (63%) had standing duties, thus indicating the importance of mechanical factors in this disease. Morning pain, important evaluation criteria, was reported by 85% of the patients, gait pain by 72% and orthostatic pain by 78%.

Conclusion

The PRP local injection is a new, readily available and well tolerated, with prolonged effect and safe choice of therapy for chronic pf and is not inferior to steroid injection in a short term up. Comparing the long-term efficacy, both clinically and sonographically is necessary to confirm their sustained effect. We can conclude that the use of PRP is an effective treatment method for patients with plantar fasciitis which do not respond to conservative treatment. However, the cost and the time for preparation the PRP are two of the disadvantages of this treatment. Steroid therapy effect appears in a short period (about 3 months post-injection), but PRP has a prolonged effect (for about 12 months post-injection). The PRP injection is better than steroid injection in relieving the pain of planar fasciitis and in improvement of the function of the patient foot.

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