Original Article

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Effectiveness of Platelete Rich Plasma (PRP) Injections in Patients with Plantar Fasciitis

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ABSTRACT

Objective: To determine the effectiveness of PLATELETE RICH PLASMA (PRP) injection in patients with plantar fasciitis interms of improvement in at least one grade of pain on visual analogue scale at 6 weeks interval follow up.
Study Design: Descriptive cross sectional study
Place and Duration of Study: This study was conducted in Orthopedics Unit of Khyber Teaching Hospital, Peshawar from March, 2012 to Feb 2013.
Materials and Methods: Patients with plantar fasciitis from the age of 20 to 50yearswho were not responding to oral medications were included in the study.
Results: There were 26 (9.38%) males and 38 (59.38%) females with mean age of 37.00 years. 45.31% patients have symptoms for 6-12 weeks where as those who had symptoms for 13-26 weeks made 48.43%of the study population. A total of 43(67.18%) patients having moderate pain before PRP only had severe pain at 6 weeks, while 25 (39.06%) had no pain, 13 (20.31%) had mild pain and 4 (6.25%) had moderate pain. Out of 21 (32.81%) patients who had severe pain before PRP, 36 (56.25%) had no pain, 18 (28.12%) had mild and 9 (14.06%) had moderate pain. Nonetheless, 3 (4.69%) had severe pain even after PRP. Over all, PRP was equally effective in patients of all ages and was more effective in men.
Conclusion: Platelet Rich Plasma which is cheap and effective can successfully treat patients with plantar fasciitis.
Key Words: Plantar fasciitis; Calcaneum; Platelets Rich Plasma injections; Effectiveness.

INTRODUCTION

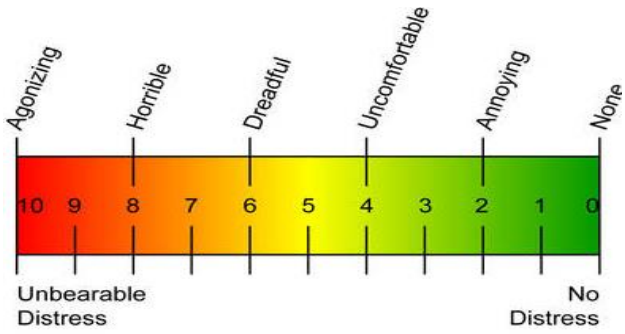
Plantar fasciitis/heel pain syndrome is one of the most common conditions treated by orthopedic surgeons in our country.[1] It affects sport participants as well as inactive middle-aged individuals with peak incidence occurring at 40-60 years of age. It occurs in 10% of the general population. One third of cases are bilateral. Plantar fasciitis typically presents as localized pain at the medial aspect of the heel.[2] It is common in athletes and accounts for 8%of all sports related injures.[3]

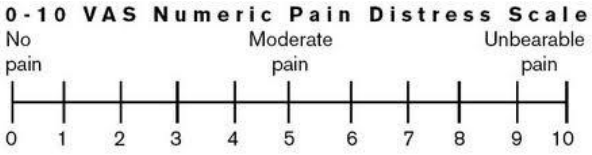
The exact cause of plantar fasciitis is unknown. The current consensus is that plantar fasciitis is initiated as micro tears in plantar fascia due to aging process and thus results in degeneration of plantar fascia which causes pain in the heel.[4] Increasing knowledge of the pathology has led to the wide spread application of a large number of conservative treatments for recalcitrant plantar fasciitis.[5], including physiotherapy, plantar-fascia-stretching exercises[6], icepacks, night splints, prefabricated and custom-made insert, shoe modification, nonsteroidal anti-inflammatory drugs (NSAIDs) and extracorporeal shock-wave therapy (ESWT) when conventional physical therapy is not effective.[7] Recently, promising results were reported with the use of platelet-rich plasma (PRP) injections for treating muscle and tendon injuries and degeneration.[8] The rationale for using PRP is to increase tendon regenerative abilities with a high content of cytokines and cells, in hyperphysiologic doses, which should promote cellular chemotaxis, matrix synthesis, and proliferation.[9] Degranulation of the alpha granules in platelets releases many different growth factors that can play a role in tissue regeneration processes. PRP represents a treatment option for many foot and ankle pathologies, including tendinopathy (Achilles, peroneal, posterior tibial, flexor halluces longus, anterior tibial) and chronic ligamentous injury, such as plantar fasciitis. The purpose of this study was to assess the safety of PRP injections for treating chronic plantar fasciitis and provide initial clinical assessment of its effectiveness.

MATERIALS AND METHODS

This descriptive cross sectional study was conducted in Orthopedics Unit of Khyber Teaching Hospital, Peshawar from June 2011 to December 2011. A total of 64 patients were included in the study comprising of 26 males and 38 females. All patients of either gender between 20 and 50 years with plantar fasciitis with moderate to severe pain according to Visual Analogue Score (VAS) were included in the study. The pain of plantar fasciitis was assessed by visual analogue score (VAS) using a 10cm as follow;

According to visual analogue scale (VAS), the pain of plantar fasciitis was graded as follows: Grade0: no pain (VAS 0), Grade 1: Mild pain (VAS 1-3), Grade2: Moderate pain (VAS 4-7), Grade 3: Severe pain (VAS8-10). Before treatment and during the follow-up visit, patients were asked to rate their pain on a visual analogue scale (VAS). All patients with mild pain according to VAS, prior surgery of foot, dislocation and fractures, prior use of steroid injections within 6 months, local skin infection or osteomyelitis and those with bilateral heel symptoms were excluded from the study. All patients meeting the inclusion criteria were included in the study through OPD of Orthopedic department. Diagnosis of plantar fasciitis was based upon pain on medial part of the heel with a point of maximum tenderness for a minimum period of 6 weeks and pain becoming worse by pressure on the heel.





The purpose and benefit of the study were explained to the patient. Detailed clinical history followed by detailed physical and systemic examination was carried out. For preparation of PRP, 30 ml of venous blood was drawn with aseptic technique from the anticubital vein by 50cc disposable syringe using 18 or 19 g butterfly needle. The blood was then centrifuged for 15 min and about 3 ml of PRP was extracted. The sites of maximal tenderness of sole at heel were located and marked with a skin marker and then infiltrated with 3ml of 2% Xylocaine injection. After waiting for 10 minutes for local anaesthesia to be effective, each marked point of tenderness was then penetrated with a D/Syringe with 23-gaugeneedle having PRP until the underlying periosteum is touched. After contacting the periosteum, the needle was gently partially withdrawn then advanced in a fan-like wheel in order to do dry needling 7 to 10 times. Next, 0.5 to 1mL of the PRP was injected as this peppering maneuver was continued. This process was then carried out at each marked site. All injections were performed by one of the authors on an outpatient basis. After injection, the patient was kept for 20 minutes under observation in the ward for hemodynamic stability and then the patient was allowed to leave. After injection, all patients were allowed to immediately walk but were advised to avoid weight-bearing sport activities, such as running or jumping, for at least four weeks after the last injection. Patients were re-assessed at 6 weeks follow up to determine intervention effectiveness. PRP injection was labeled as effective in patients who showed improvement in terms of decrease in at least one base line grade of pain at 6weeks follow up. All the above mentioned information including name, age, sex, address was recorded in a pre-designed proforma. Data was entered and analyzed by SPSS version 10.0. Descriptive statistics were applied for age, gender, severity of plantar fasciitis pain and effectiveness of injection therapy. Frequency and percentages were calculated for all categorical data.

RESULTS

The total number of patients was 64 including 38 (59.38%) females and 26 (9.38%) males with male to female ratio of 1 to 1.46. The mean age was 37 years with age range of 21 to 50 years. The right sided planter fasciitis was noted in 44 (68.75%) patients while 20 (31.25%) patients had left sided planter fasciitis.

45.31% patients have symptoms for 6-12 weeks where as those who had symptoms for 13-26 weeks made 48.43%of the study population (Table 1).

Table No. 1: Duration of symptoms in patients with planter faciitis

Duration of symptoms	Number of Patients n(%)
6-12 Weeks	29 (45.31%)
13-19 Weeks	18 (28.12%)
20-26 Weeks	13 (20.31%)
27 Weeks and above	04 (6.25%)
Total	64 (100%)

Table No. 2: Effectiveness of platelet rich plasmain terms of improvement of pain on vas at 6 weeks follow up

Before PRP	After PRP				Total
	No Pain	Mild Pain	Moderate Pain	Severe Pain	
Moderate Pain	25 (39.06%)	13 (20.31%)	4 (6.25%)	1 (1.56%)	43 (67.18%)
Severe Pain	11 (17.18%)	5 (7.81%)	3 (4.69%)	2 (3.12%)	21 (32.81%)
Total	36 (56.25%)	18 (28.12%)	9(14.06%)	3 (4.69%)	64 (100%)

B PRP= Platelet Rich Plasma, VAS = Visual Analogue Score

A total of 43(67.18%) patients having moderate pain before PRP only had severe pain at 6 weeks, while 25 (39.06%) had no pain, 13 (20.31%) had mild pain and 4 (6.25%) had moderate pain. Out of 21 (32.81%) patients who had severe pain before PRP, 36 (56.25%) had no pain, 18 (28.12%) had mild and 9 (14.06%) had

moderate pain. Nonetheless, 3 (4.69%) had severe pain even after PRP (Table 2).

Over all, PRP was equally effective in patients of all ages; however it was more effective in men than women. (Table 3)

Table No. 3: Age and gender wise distribution of effectiveness of pRP injection in patients with planter faciitis

Age	No Pain	Mild Pain	Moderate Pain	Severe Pain
20-30 years N = 13 (20.31%)	9 (14.06%)	2 (3.12%)	1 (1.56%)	1 (1.56%)
31-40 years N = 31 (48.44%)	23 (35.94%)	3 (4.69%)	2 (3.12%)	3 (4.69%)
41-50 years N = 20 (31.25%)	13 (20.31%)	4 (6.25%)	2 (3.12%)	1 (1.56%)
Total N = 64 (100%)	45 (70.31%)	9 (14.06%)	5 (7.81%)	5 (7.81%)
Gender				
Male N = 24 (37.5%)	18 (28.12%)	3 (4.69%)	2 (3.12%)	1 (1.56%)
Female N = 40 (62.5%)	27 (42.19%)	6 (9.38%)	3 (4.69%)	4 (6.25%)
Total	45 (70.31%)	9 (14.06%)	5 (7.81%)	5 (7.81%)

N= Total number of patients, n= Number of patients showing effectiveness to autologous blood injection

DISCUSSION

Plantar fasciitis is a common foot problem. Itaffects approximately 2 million people annually and affects as much as 11-15% of the population over thecourse of a lifetime.[10] Plantar fasciitis is characterized by a sharp, stabbing and burning pain in theposteromedial aspect of heel. It is a commonobservation that initial treatment of plantar fasciitisshould be conservative because 90% of patients respond to it.[11] Plantar fasciitis is usually observed in the 40-60year age group, but has been reported in people from7 to 85 years and appears to be more common infemales.[12] In our study female predominance was observed. However, age wise distribution is different in our study. In our study it was more common in the age group of 31-40 years.Conservative treatment has shown a wide range of acceptable outcome with success rates ranging from 46% to 100%.[13] However, 20% to 30% of patientstreated with traditional measures progress to a chronic condition.[14] In our study the effectiveness ofPlatelet Rich Plasmas was determined by VASat 6 weeks interval. Our results were that 77.10% had no pain (grade 0), 9.16% had mild pain (grade 1),6.11% had moderate pain (grade 2) while 7.63% had no improvement with severe pain (grade 3). The overalleffectiveness of the procedure was 92.3%. Lee et al[15] compared Platelet Rich Plasmas to corticosteroid injections for the treatment of chronicplantar fasciitis. At 6 weeks and 3 months, the corticosteroid group had significantly lower VAS thanthe autologous blood group, but the difference wasnot significant at 6 months. The conclusion of this study was that Platelet Rich Plasma is more efficaciousin lowering pain and tenderness in plantar fasciitis butcorticosteroid is more superior in terms of speed and improvement. However this study was comparative in design and patients were assessed over a period of 6 months whereas in our study assessment was done at 6 weeks interval. In our study the overall effectiveness in both gender groups according to VAS at 6 weeks follow up was 92.37%. One of the studies has shown[14] that the combination of two modalitiesthat is conventional and local steroid application iseffective in treating this painful condition and these results match with the study done by Nuefeld SK et al [16] showed that nonsurgical treatment of plantarfasciitis has a success rate of 90%. However, in another study it was noted that there is significant riskof plantar fascia rupture with corticosteroid injections.[6] In our study no such complication occurred. Thus Platelet Rich Plasmas in plantar fasciitis is more safe, cheap and effective as compared to other modalities.[17] In another study by Frontera RW, effectiveness of Platelet Rich Plasmas in plantar fasciitis the effectiveness was 80%.[18, 19] Most of the international studies have been carried out in literate communities with good compliance of the patients.[5, 20] while we faced certain problems during this study. The limitations of this study were lack of regular physiotherapy, NSAIDS and short follow up period. Also many patients reporting to us had already taken multiple types of medication by themselves and most were from rural or some far flungareas and they were treated by the hakeems or by the traditional healers. Many of the patients had beentaking oral steroids for a long time. Due to excessiveuse of so many drugs they were not responding to thetreatment of plantar fasciitis. However the results ofthis study are very encouraging and further studies oflonger duration and comparison may be needed toconfirm our results.

CONCLUSION

Patients with plantar fasciitis can besuccessfully treated with Platelet Rich Plasmasinto the plantar fascia and its efficacy is good in termsof improvement in at least one grade of pain on visualanalogue scale at 6 weeks follow up.

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