

# EFFICACY OF PLATELET RICH PLASMA VERSUS STEROID INJECTION IN PLANTER FASCIITIS

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## ABSTRACT

**Background:** Plantar fasciitis is local inflammation and fibrosis of the plantar aponeuroses, reducing the quality of life and productivity of affected individuals. Pain in the heel and bottom of the foot is the ultimate outcome. **Objectives:** To compare the effect of platelet rich plasma and steroid injections among patients having planter fasciitis. **Methodology:** This Quasi experimental study was conducted at the Department of Orthopedic Surgery at Allied and DHQ Hospital, Faisalabad from 1<sup>st</sup> July 2015 to 30<sup>th</sup> June 2017. Total of 28 patients with age range of 25 -60 years were included in the study. 14 patients received platelet rich plasma (PRP) injection (Group A) and 14 were treated with a steroid injection (Group B) and were followed for the outcome at 0, 6 and 24 weeks to assess mean American Foot & Ankle score and Visual Analogue score. The data was entered in and analyzed by using SPSS version 20. **Results:** Our study showed that mean AFAS was 80. ± 4. at 6 weeks and 91. ± 1.6 at 24 weeks in the group A and 71.4 ± 3.7 and 80 ± 3.2, respectively, in the group B. (p<0.001) The mean VAS 14 in group A was (2.7 ± 0.6 and 1 ± 0.3) and group B (3 ± 1.1 and 2.1 ± 0.9) at the 6th week and 24 weeks was statistically significant. (p<0.001) **Conclusion:** Platelets Rich Plasma appears to be better as compared to steroid injection in terms of pain relief in the treatment of planter fasciitis.

**Key words:** Plantar fasciitis, Platelet Rich Plasma, Steroid, Pain

## INTRODUCTION

Plantar fasciitis usually bilateral is an inflammation and fibrosis of the plantar aponeuroses, resulting in pain at heel and bottom of foot.<sup>1,2,3</sup> This pain starts at beginning of day and usually slow in onset.<sup>4,5,6,7</sup> Plantar fasciitis, mostly is a self-limiting condition.<sup>4</sup> The patient and the physician feels bothered by this process and its management, however due to the natural course of the disease, most of treatment options are nonsurgical, including: stretching exercises, splints, orthoses, non-steroid anti-inflammatory drugs, steroid injections, and extracorporeal shockwave therapy among, Others are the conservative treatment options.<sup>5,6,7,8</sup> Today, there is in fact no convincing conservative treatment option to alleviate the disease.

Platelet-rich plasma (PRP), with its growth factors contained in the platelets promotes natural healing process. PRP in the damaged area speeds up the healing, decreases pain and has anti-inflammatory effects.<sup>9,10,11</sup> The reason for using PRP in this degenerative disease is meant to initiate the cellular cascade process that stops due to inadequate conservative methods, therefore converting the chronic injury to a new and fresh damage.<sup>12-15</sup>

In plantar fasciitis resistant to all these modalities, local steroid injections are sometimes used.<sup>14,15</sup>

The objective of this study was to assess the effect of PRP on pain compare with that of steroid injection.

## METHODOLOGY

This Quasi experimental study was conducted at Allied Hospital, Faisal Abad from 1<sup>st</sup> July 2015 to 30<sup>th</sup> June 2017. Approval was sought by the hospital ethical committee and informed verbal consent was taken from all participating in the study. Patients who were diagnosed as having plantar fasciitis, were followed up for 6 months. Diagnosis of plantar fasciitis was made clinical examination and X-rays were used to rule out other disorders. Exclusion criteria was any systemic disease, pregnancy, active malignancy or blood dyscrasias, sepsis, anticoagulant use, NSAIDs use in the five days before the study, thrombocyte count less than 150,000/mm<sup>3</sup>, prior steroid injection to the heel, a calcaneal fracture.

A total of 28 patients were included in this study. Patients were divided into Platelet Rich Plasma group (PRP) (Group A) and steroid group (Group B) of 14 each PRP was injected following a technique mentioned by Anitua et al.<sup>9</sup> 3.2% sodium citrate was added to the 30-35 cc blood drawn from the antecubital vein. Blood samples were spun with a centrifuge machine at 1800 rpm for 8 minutes at room temperature, and was sent to the hospital laboratory for micro-organisms detection and platelet count. After activation, 2.5 ml of PRP

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containing 5.5% calcium chloride (Cl<sub>2</sub>Ca) was administered on the foot from the medial side to the most tender location by feeling under aseptic measures in Group A. 40 mg of methylprednisolone and 1 ml of local anesthetic was applied in steroid (Group B). Achilles and plantar fascia stretches were advised to the patients. Patients were counselled to have rest for one day after treatment. The American Foot and Ankle Score (AFAS)<sup>10</sup> and the visual analog scale (VAS) were used in the clinical assessment. Data was analyzed by computer software SPSS version 20. Continuous variables like age and pain were analyzed as mean  $\pm$  SD and compared by using independent t-test. Variables like sex were presented as percentages and compared by using chi-square test. Statistical significance was taken as P value of  $\leq 0.05$ .

## RESULTS

Baseline characteristics are shown in table I. In group A, 8 were females and in Group B 7 were females. In group A (PRP), AFAS score was  $80.5 \pm 4.2$  at the 6<sup>th</sup> week and  $91.3 \pm 1.6$  at the 6<sup>th</sup> month follow-up. whereas VAS score was  $2.7 \pm 0.6$  at the 6<sup>th</sup> week and  $1 \pm 0.3$  at the 6<sup>th</sup> month. In the steroid group (Group B), AFAS score was  $71.4 \pm 3.7$  at the 6<sup>th</sup> week and  $80.3 \pm 3.2$  at the 6<sup>th</sup> month follow-up. VAS scores was  $3 \pm 1.1$  and  $2.1 \pm 0.9$  at the 6<sup>th</sup> week and 6<sup>th</sup> month follow-up. (Table II) No complication was reported in either group.

**Table I: Comparison of Both Groups at Baseline**

	PRP (n= 14) (Group A) (Mean $\pm$ SD)	STERIOD (n=14) (Group B) (Mean $\pm$ SD)	P Value
Age	49 $\pm$ 12	51 $\pm$ 61	$\geq 0.05$
AFAS	60.8 $\pm$ 8.5	58.1 $\pm$ 1.7	$\geq 0.05$
VAS	7.8 $\pm$ 1	8.1 $\pm$ 0.9	$\geq 0.05$

**Table II: Comparison of both groups at baseline, 6 weeks & 6 months**

Pain Scales	PRP group (Group A) (n=14) (Mean $\pm$ SD)	Steroid group (Group B) (n=14) (Mean $\pm$ SD)	P Value
<b>AFAS</b>			
Baseline	60.8 $\pm$ 8.5	58.1 $\pm$ 1.7	$\geq 0.05$
6th week	80.5 $\pm$ 4.2	71.4 $\pm$ 3.7	$\leq 0.001$
6th month	91.3. $\pm$ 1.6	80.3 $\pm$ 3.2	$< 0.001$
<b>VAS</b>			
Baseline	7.8 $\pm$ 1	8.1 $\pm$ 0.9	$\geq 0.05$
6th week	2.7 $\pm$ 0.6	3 $\pm$ 1.1	$< 0.001$
6th month	1 $\pm$ 0.3	2.1 $\pm$ 0.9	$< 0.001$

## DISCUSSION

Among the multiple treatment options available for planter fasciitis, none is considered gold standard yet. A study showed that pain was significantly improved in patients treated with platelet rich plasma compared with steroids. ( $P = < .001$ ).<sup>11</sup> Mean post-operative pain according to Visual analogue score for steroids treated patients was  $4.6 \pm 0.8$  and for patients treated with platelet rich plasma it was  $1.5 \pm 0.6$ , while in another study mean post-operative pain was  $5.6 \pm .5$  in steroid group and  $1.8 \pm 0.7$  in platelet rich plasma group. The functional outcome was markedly improved among platelet rich plasma treated patients as compared to the steroid group.<sup>12</sup>

A short term relief is seen with the use of steroids. In current study, we found a remarkable effect on pain in both groups and better in PRP group. Our study showed that no complication was found in any group. However, studies showed that steroid injections are associated with tear in fascia,<sup>14</sup> atrophy of fat pad, sepsis,<sup>15</sup> and osteomyelitis.<sup>16</sup> Platelet-rich plasma activates cellular repair in circulation. Alpha granules of platelets contain more than 30 proteins.<sup>17</sup> PRP also is fraught with growth factors, i.e; transforming growth factor, insulin-like growth factor, and proteins. These growth factors exhibit a role in many stages of cellular repair. PRP activates the local stem cells and activities the repair cells with these growth factors. PRP offers revascularization by growth factors to increase tenocyte production in the injured area which increases expression of collagen in the tenocytes.<sup>18</sup> Multiple ways can be utilized to get PRP; we followed the one described by Anitua et al.<sup>9</sup> Platelet concentration higher than normal platelet count was proved to be the most efficacious in another study.<sup>19</sup> Ideal concentration of PRP is still not decided and there is no consensus on it. Same is true for frequency of application or platelet activation.

Few studies using ultrasound measured the thickness of the plantar fascia and after the treatment decreased thickness of the plantar fascia was observed and patients were free of symptoms after follow up.<sup>18,19</sup> However, due to steroid side effects, Platelet Rich Plasma was preferred. Other studies observed that plantar fascia thickness reduced on USG applying PRP to 25 patients and 88% of the patients were free of symptoms after follow-up of about one year.<sup>20,21</sup> In evaluation of the results of current study, the post-treatment 6<sup>th</sup> week and 6<sup>th</sup> month, the pain scores as measured in terms of AFAS and VAS were markedly reduced. The improvement in the pain scores of the PRP group were clearly superior to those of the

steroid group.

In this study, a complete recovery was determined at follow up period of 24 weeks, it may be possible that its effects still continue. For PRP obtained from the same patients blood, there is no risk of any reaction. We did not notice any significant complication in the PRP group. Lack of randomization limits the results of this study. Moreover, small sample size and comparatively shorter period of follow-up was limitation of this study.

## CONCLUSION

Our study showed that platelets rich plasma is more effective than steroid in the treatment of planter Fasciitis. We recommend studies with longer follow up and larger sample size.

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