

# Comparison of Outcome of Steroid Versus Platelet Rich Plasma Injections in The Treatment of Lateral Epicondylitis of Humerus

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## ABSTRACT

**Objective:** To compare the efficacy of local injection of PRP with corticosteroids in terms of mean pain score among patients of tennis elbow (lateral epicondylitis of humerus). **Study design:** Randomized controlled trial. **Settings:** Department of Surgery, THQ Hospital GOJRA. **Duration:** 11<sup>th</sup> August, 2018 to 10<sup>th</sup> February, 2019. **Methodology:** 80 patients of tennis elbow having age ranges from 25-60 years of either gender was included. Patients were randomly divided into two groups. Group A patients received steroid injection while group B patients received PRP injections. Pain was assessed after 12 weeks of treatment. **Results:** Out of 80 patients, mean age was 44.17±9.441 years. There were 45(56.2%) patients were male and 35(43.8%) patients were females. Pain score in group A was 2.8±1.24 and in group B it was 0.8±0.758 with p-value = 0.0001. **Conclusion:** The results of my study showed that PRP is better than steroid injections in controlling and reducing pain in patients of tennis elbow.

**Keywords:** Tennis elbow, Lateral epicondylitis, Platelet rich plasma.

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## INTRODUCTION

The most common symptom of Tennis Elbow, technically known as Lateral Epicondylitis, is pain involving common extensor origin of the forearm. The disorder arises as a result of overexertion of wrist and finger extensors by repetitive manual work. Clinically, it reveals both direct and indirect tenderness at the lateral epicondyle.<sup>1</sup>

Although lateral epicondylitis is quite easily diagnosed and different treatment options are used for its optimal management.<sup>2</sup>

Platelet rich plasma is a concentrate of platelets derived from the patient's own blood. The PRP contain platelets and growth factors that build up reparative processes. The response of PRP therapy in chronic tendinopathies is uncertain and it is hypothesized that it induces angiogenesis and increase the expression of growth factors, cell proliferation, the recruitment of repair cells and tensile strength. As the lateral epicondylitis is characterized by complex changes in the tendon in addition to an inflammatory process, PRP owing to its high content of various growth factors may be more efficacious as a healing agent. However, studies on lateral epicondylitis with PRP treatment have yielded inconclusive and contrasting results with respect to symptom free period.<sup>3</sup>

The rationale of this study is to provide guidelines to future orthopedic surgeons to use PRP injection as common procedure because this treatment is not commonly used in our setup due to lack of experience and there is paucity of evidence on which we can base treatment recommendations. The innovation in this research is that PRP could have better

outcome in terms of pain alleviation as compared to steroids for long time period.<sup>4</sup>

The diagnosis is basically made by observing the patient's history and clinical examination. The main complaint consists of pain in the region of the lateral epicondyle extending to the dorsum of the forearm, along with incapacity to practice sports or do manual labor activities and activities of daily living. In general, the pain arises through activities that involve active extension or passive flexion of the wrist with the elbow extended.<sup>5</sup>

Platelet-rich plasma and autologous blood injection:

Several studies have compared the injection of PRP or ABI to injection of corticosteroids demonstrating a significant ( $p < 0.005$ ) difference in favor of the groups receiving PRP injections over those receiving corticosteroid injections with follow-up intervals up to 2 years.<sup>6</sup> Similarly, Kazemi et al. compared ABI to corticosteroid injection in a RCT where assessors were unaware of treatment. At 8 weeks, ABI was found to be more effective in all outcomes.<sup>7</sup>

A recent study by Krogh et al. did not find PRP superior to corticosteroid injection at 1 month or to either corticosteroid injection of placebo at 3 months of follow-up; however, tendon thickness was found to be reduced on ultrasound examination in corticosteroid injection over PRP or placebo test subjects.<sup>8</sup>

PRP has also been compared directly to ABI. Creaney et al. conducted a double-blind RCT with patients receiving injections at 1-month intervals of either autologous blood or PRP. Both preparations produced improvement over 6 months, but there were no differences between groups.<sup>9</sup> Thanasis et al. also

compared the two in an RCT in which assessors were unaware of treatment allocation. Ultrasound guidance and peppering injection technique was used in both groups.<sup>10</sup> Statistically significant ( $p < 0.05$ ) improvement in pain for PRP over ABI was present only at 6 weeks.<sup>11</sup>

## METHODOLOGY

**Study design:** Randomized controlled trial.

**Settings:** Department of Surgery, THQ Hospitals, Gojra-Pakistan

**Duration:** 11<sup>th</sup> August, 2018 to 10<sup>th</sup> February, 2019.

**Sample size:** By using World Health Organization (WHO) sample size calculator for two means,

Anticipated population mean = 36.3<sup>3</sup>

Test value of population mean = 7.33<sup>3</sup>

Pooled standard deviation = 9.89

Level of significance = 5%

Power of study = 90%

Sample size = 80 (40 in each group)

**Sampling technique:** Non-probability, consecutive sampling.

**Inclusion criteria:**

Patients from 25-60 years of age of either gender having clinical diagnosis of lateral epicondylitis of humerus (as per operational definition).<sup>12</sup>

**Exclusion criteria:**

1. Patients received local steroid injection within 6 months,
2. Had previous surgery of the elbow,
3. Previous fracture to lateral condyle or
4. Having other associated diseases of Upper limb (vascular insufficiency, Diabetic, neuropathy, and elbow joint disorder)<sup>13</sup>

**Data collection procedure:** Approval from the institutional ethical review committee was sought. All the patients with diagnosis of Lateral epicondylitis of humerus fulfilling the inclusion criteria were entered in the study after informed written consent. The qualifying patients were informed of the risk and benefits of each operation and asked to sign a detailed informed consent in their respective native language. Computer-generated random numbers were used to assign the type of treatment (group A or B). Group A patient undergo treatment with steroids and Group B patient undergo treatment with PRP. All the relevant information was filled on predesigned Performa (Annexure). Post treatment pain was noted and scored at 12 weeks in the ward by each patient on a visual analogue scale (VAS) consisting of a 10-cm-long horizontal line without graduations varying from "no pain at all" on the left side to "unbearable pain" on the right side. Afterward, the VAS was scored by measuring the length in millimeters left of the patient's mark.<sup>14</sup>

**Data analysis:** Data was analyzed by SPSS computer software version-20. Continuous variables like age and pain were analyzed using means, standard deviation and compared by using independent t-test. Categorical variable like Gender was analyzed using frequencies and percentages. Statistical significance was set at p value of less than or equal to 0.05. Effect modifier like age and gender were controlled by stratification. Post stratification independent t-test was applied.

## RESULTS

80 patients having lateral epicondylitis of humerus included in the study and randomly divided into two groups. Group A patients undergo treatment with steroids and Group B patient undergo treatment with PRP.

Out of 80 patients, mean age of the patients was  $44.17 \pm 9.441$  years. Minimum age was 25 years while maximum age was 60 years.

**Table 1: Descriptive statistics of Age**

	n	Minimum	Maximum	Mean	Std. Deviation
age	80	25	60	44.17	9.441

In group A, out of 40 patients, mean age was  $45.77 \pm 9.037$  years and in group B, out of 40 patients, mean age was  $42.57 \pm 9.677$  years.

**Table 2: Descriptive statistics of Age among both groups**

Group		n	Minimum	Maximum	Mean	Std. Deviation
Group A	age	40	25	60	45.77	9.037
Group B	age	40	25	58	42.57	9.677

Out of 80 patients, 33 (41.2%) patients had age between  $\leq 40$  years and 47 (58.8%) patients had age  $> 40$  years. In group A, out of 40 patients, 14 (35%) patients had age between  $\leq 40$  years and 26 (65%) patients had age  $> 40$  years. In group B, out of 40 patients, 19 (47.5%) patients had age between  $\leq 40$  years and 21 (52.5%) patients had age  $> 40$  years with p-value = 0.256.

**Table 3: Pain score at 12 weeks between both groups**

Variable	Group		p-value
	Group A	Group B	
Pain at 12 weeks	$2.86 \pm 1.24$	$0.8 \pm 0.758$	0.0001

Patients having age  $\leq 40$  years, in group A, mean pain score was  $2.86 \pm 1.46$  while in group B, mean pain score was  $1 \pm 0.816$  with p-value = 0.0001. Patients having age  $> 40$  years, in group A, mean pain score was  $2.77 \pm 1.14$  while in group B, mean pain score was  $0.62 \pm 0.669$  with p-value = 0.0001.

**Table 4: Pain score at 12 weeks between both groups among different age groups**

Age distribution	Variable	Group		p-value
		Group A	Group B	
$\leq 40$ years	Pain at 12 week	$2.86 \pm 1.46$	$1 \pm 0.816$	0.0001
$> 40$ years	Pain at 12 week	$2.77 \pm 1.14$	$0.62 \pm 0.669$	0.0001

Out of 45 male patients, in group A, mean pain score was  $2.57 \pm 1.21$  while in group B, mean pain score was  $0.71 \pm 0.806$  with  $p$ -value = 0.0001. Out of 35 female patients, in group A, mean pain score was  $3.05 \pm 1.35$  while in group B, mean pain score was  $0.94 \pm 0.68$  with  $p$ -value = 0.0001.

**Table 5: Pain score at 12 weeks between both groups among both gender**

Gender	Variable	Group		p-value
		Group A	Group B	
Male	Pain at 12 week	$2.57 \pm 1.121$	$0.71 \pm 0.806$	0.0001
Female	Pain at 12 week	$3.05 \pm 1.35$	$0.94 \pm 0.68$	0.0001

## DISCUSSION

Today, it is clear that lateral epicondylitis is a degenerative disorder that compromises the extensor tendons originating from the lateral epicondyle, extending infrequently to the joint.<sup>15</sup> Although the terms epicondylitis and tendinitis are used to describe "tennis elbow", histopathological studies characterize this condition not as an inflammatory condition but, rather, as a form of tendinosis with a fibroblastic and vascular response called angiofibroblastic degeneration of epicondylitis.<sup>16</sup>

Despite the classical description relating to practicing the sport of tennis, only 5 to 10% of the patients who present epicondylitis practice this sport. Thus, tendinosis of the elbow is more common among non-sports players.<sup>17</sup>

The peak incidence occurs at around 40–50 years of age group and in women aged 42–46 years, incidence increases to 10%. In the UK, the Netherlands, and Scandinavia, the annual incidence of lateral elbow pain in general practice is 4-7/1000 population. Acute onset of symptoms occurs more often in young athletes; chronic, recalcitrant symptoms typically occur in older patients.<sup>16</sup> Lateral epicondylitis is seen more commonly in the dominant arm and among Caucasians.<sup>18</sup>

Lateral epicondylitis is a common occurrence in the general population with an incidence of 4-7/1000/year.<sup>19</sup>

Lateral epicondylitis, is significantly more common than medial epicondylitis and has an annual prevalence of 1% to 2% in the general public. As its eponym implies, lateral epicondylitis has a high association with tennis, particularly one-handed backhand strokes. Nearly 40% to 50% of recreational tennis players will suffer this condition during their lifetime.<sup>20</sup>

The natural course of the condition seems to be favourable, with spontaneous recovery within 1–2 years in 80–90% of the patients; however, there is very little scientific data available on the natural history of the disease.<sup>21</sup> Lateral epicondylitis is commonly a self-limiting condition that will resolve in approximately 90% of cases within one year without surgical intervention.<sup>22</sup>

The results of my study showed that PRP is better than steroid injections in controlling and reducing pain in patients of tennis elbow (lateral epicondylitis of humerus). PRP injections should

be used in routine practice for tennis elbow to overcome the patients complains in terms of pain.

Yadav et al<sup>1</sup> conducted a study on comparison of local injection of platelet rich plasma and corticosteroids in the treatment of lateral epicondylitis of humerus. They found that mean pain score in steroid group 2.8 while in PRP group it was 1.6. They concluded that PRP and steroid injections both are effective in the treatment of lateral epicondylitis. However, PRP is a superior treatment option for longer duration efficacy.

Omar et al<sup>2</sup> conducted a randomized control trial on local injection of autologous platelet rich plasma and corticosteroid in treatment of lateral epicondylitis and plantar fasciitis. According to their results, pain score with PRP was  $3.8 \pm 1.9$  and with steroids it was  $4.3 \pm 2.1$ . They concluded that local injection of autologous PRP proved to be a promising form of therapy for tennis elbow patients.

Krogh et al<sup>12</sup> conducted a study on Comparative effectiveness of injection therapies in lateral epicondylitis: a systematic review and network meta-analysis of randomized controlled trials. They reported that PRP and steroids are equally effective in pain alleviation which is not similar to our results.

## CONCLUSION




The results of my study showed that PRP is better than steroid injections in controlling and reducing pain in patients of tennis elbow (lateral epicondylitis of humerus). PRP injections should be used in routine practice for tennis elbow to overcome the patients complains in terms of pain.

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