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## COMPARISON BETWEEN STEROID AND PRP INJECTIONS IN MEDIAL EPICONDYLITIS (GOLFER'S ELBOW) PATIENTS

Nissanth Chandrasekaran, Shri Vishnu Manokaran, Harish Babu Jayakaran and Gandhamsetty Sai Ganesh,

Department of Orthopaedics, Saveetha Medical College and Hospital, Thandalam, Kancheepuram - 602105, Tamil Nadu, India.

### Keywords:

Golfer's elbow, PRP, Steroid, VAS, DASH

### Correspondence to Author: Dr. Yeshwanth Subash

Professor,  
Department of Orthopaedics,  
Saveetha Medical College and  
Hospital, Thandalam, Kancheepuram  
- 602105, Tamil Nadu, India.

**E-mail:** djyesh@rediffmail.com

**ABSTRACT: Background:** Golfer's elbow, commonly known as medial epicondylitis, is an overuse syndrome caused by an eccentric overload of flexor-pronator mass on the medial epicondyle. This is produced by repetitive actions causing micro-trauma to insert the flexor-pronator mass, which affects the pronator teres more than the flexor carpi radialis. This study evaluates the efficacy of platelet-rich plasma and steroid injections in treating the golfer's elbow. **Materials and Methods:** This is a prospective study including 30 patients. They were divided into 2 groups Group A (n = 15) and B (n = 15). PRP injection was given for Group A patients, and for Group B patients, Steroid injection was given. There was a total of 17 Females and 13 males in the study. All the patients were followed up at 1<sup>st</sup>, 2<sup>nd</sup> and 6<sup>th</sup> months post-procedure, VAS and DASH scores were analyzed. **Results:** In group A, the mean VAS score pre-PRP was 6.8, which improved to 1.93, 1.26 and 1.06, and the mean DASH score pre-PRP injection was 34.8, which improved to 11.8, 11.1, 10 at 1<sup>st</sup>, 2<sup>nd</sup> and 6<sup>th</sup> months follow up. In group B, the mean VAS score pre-steroid injection was 5.8, which improved to 3.2, 2.6, and 2.2 and the mean DASH score pre-steroid injection was 34.4, which improved to 23.3, 22.6, 22.4 at 1<sup>st</sup>, 2<sup>nd</sup> and 6<sup>th</sup> months follow up. **Conclusion:** PRP injection gives good functional outcomes without complications compared to steroid injection.

**INTRODUCTION:** The overuse syndrome known as golfer's elbow, also known as medial epicondylitis, is produced by an eccentric overload of flexor-pronator mass on the medial epicondyle. Tenderness around the medial epicondyle, which intensifies with resisted forearm pronation and wrist flexion, can be used to identify this <sup>1</sup>.

Workers lifting heavy objects and overhead throwers are at a high risk of medial elbow pain <sup>2</sup>. This is produced by repetitive actions causing micro-trauma to insert the flexor-pronator mass, which affects the pronator teres more than the flexor carpi radialis.

Treatment is mostly non-operative, like rest, ice pack application, lifestyle modifications, brace application, and extracorporeal shock wave therapy. Rarely is surgical management used for patients with persistent symptoms despite non-operative management. In refractory situations, surgical repair and debridement may be required <sup>3</sup>. The flexor-pronator group is reattached after open

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debridement of the Pronator teres / Flexor carpi radialis. The choice of injections used in treating medial epicondylitis (golfer's elbow) is steroid, botulinum toxin, hyaluronic acid, and PRP. However, recent clinical evidence shows that PRP outperforms other traditional techniques, including shockwave therapy and dry needling. This study aims to compare the efficacy of two treatment modalities for golfer's elbow (steroid vs PRP). Various pain scores have been accepted as one of the most accurate and reliable methods of assessing the patient's pain and response to pain management<sup>5</sup>. The Visual Analogue Scale (VAS) is the most frequently used scoring system to measure pain intensity<sup>6</sup>.

The DASH score (Disability of Arm, Shoulder, and Hand) is increasingly being employed as an outcome measure for upper limb disease. The DASH score is also used to assess the level of disability in patients who have suffered lower-limb injuries. When assessing the disability evaluated by the DASH score to upper limb injuries when difficulties are also apparent in the lower limb, caution should be exercised. This study aims to evaluate the efficacy of the platelet-rich plasma and steroid injections in treating the golfer's elbow (medial epicondylitis).

**MATERIALS AND METHODS:** A prospective study was conducted with 30 patients after the ethical committee approval (SMC/IEC/2020/11/83) with golfer's elbow who came to our institution between January 2021 to June 2021. Patients were divided into groups of 2 (15 per group). In that group A received PRP injections and group B received steroid injections. Pre-treatment and post treatment Visual Analogue Scale (VAS) score and DASH score [1 month, 2 months and 6 months] were analysed.

#### **Inclusion Criteria:**

- Patients with medial epicondylitis (golfer's elbow).
- Skeletally matured patients.
- Patients who are willing to participate in the study.
- Patients who are willing for follow-up.

#### **Exclusion Criteria:**

- Patients who have undergone previous treatment (injections).
- Skeletally immature patients.
- Patients who are not willing to participate in the study.
- Patients who are allergic to the drugs used.

**Steroid Injection:** Patient in the supine posture, afflicted arm in abduction and supination, painted and draped, under aseptic precautions. The medial epicondyle is where the most soreness can be felt. The needle is placed right down to the level of bone, then withdrawn 1 to 2 mm before slowly injecting the anaesthetic (2 percent lignocaine) and corticosteroid (Kenocort 40mg) solution using an aseptic procedure.

**PRP Preparation and Injection:** PRP is created using a sample of the patient's blood collected during treatment. The 30ml venous blood, 3-5 cc of PRP can be produced. The blood is drawn with the addition of an anticoagulant, such as citrate dextrose A, which prevents platelet activation before to usage. PRP is prepared using a specialized 'table top cold centrifuge' apparatus. Under aseptic conditions, the prepared PRP is injected at the point of maximal tenderness. Post injection, patients were given analgesics for a period of 1 week, and physiotherapy and lifestyle modifications were advised. Every patient was asked to come for regular follow-up on 1<sup>st</sup>, 2<sup>nd</sup> and 6<sup>th</sup> months. None of the patients missed follow-up.

**Statistical Analysis:** The data were subjected to statistical analysis using paired T-test. SPSS software was used to tabulate and analyze the data.

**RESULT:** The study involved a total of 30 patients. They were split into Group A (15 people) and Group B (15 people). PRP injection was given for Group A patients, and for Group B patients, Steroid injection was given. Out of the 30 patients, the minimum age was 20 years, and the maximum was 51 years, with the mean age being 35.56 years. There were 13 females (43.3%) and 17 males (56.7%) in the study.

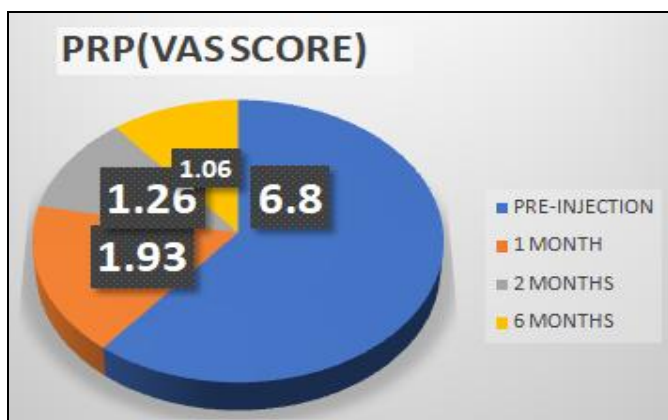
The left elbow was affected in 13 patients (43.3%), while the right elbow was affected in 17 patients (56.7%). All the patients were followed up at 1<sup>st</sup>, 2<sup>nd</sup> and 6<sup>th</sup> months post-procedure **Table 1**.

**TABLE 1: PATIENT DEMOGRAPHICS AND DATA**

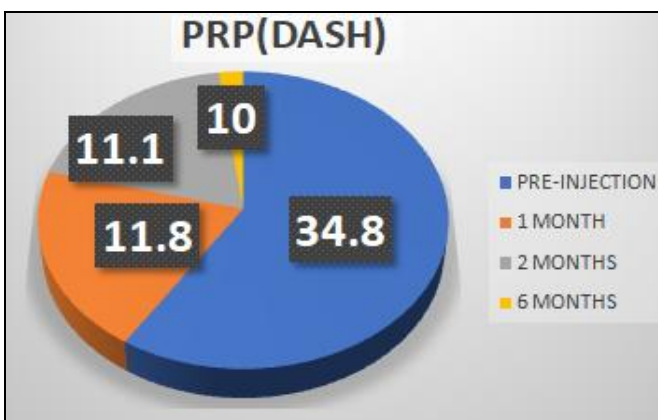
S. no.	Age (Years)	Gender	Side	Prp	Steroid	Vas Score Pre-Injection	Vas Score Post-Injection (Months)			Dash Score Pre-Injection	Dash Score Post-Injection (Months)		
							1	2	6		1	2	6
1	42	F	RIGHT	✓	×	6	2	1	1	35	12	11	10
2	23	F	LEFT	✓	×	8	2	2	1	33	10	9	9
3	45	M	RIGHT	✓	×	7	3	1	1	36	11	11	9
4	34	M	LEFT	✓	×	5	2	1	1	40	12	10	9
5	21	M	RIGHT	✓	×	6	3	2	1	34	10	10	10
6	47	F	LEFT	✓	×	6	3	2	2	32	10	10	9
7	33	M	RIGHT	✓	×	7	1	1	1	30	14	12	10
8	20	F	RIGHT	✓	×	5	1	1	1	35	13	13	11
9	24	M	LEFT	✓	×	8	1	1	1	36	12	11	11
10	32	M	LEFT	✓	×	8	2	2	1	37	11	11	10
11	30	F	RIGHT	✓	×	8	2	1	2	33	12	12	10
12	49	F	RIGHT	✓	×	7	1	1	1	35	14	13	11
13	50	F	LEFT	✓	×	6	3	1	1	35	13	12	10
14	28	M	LEFT	✓	×	8	2	1	1	34	12	11	11
15	27	M	LEFT	✓	×	7	1	1	1	34	11	11	10
16	46	M	RIGHT	×	✓	7	4	3	2	36	24	24	24
17	51	M	LEFT	×	✓	6	3	3	3	35	22	22	22
18	30	F	RIGHT	×	✓	5	3	2	2	32	20	21	20
19	51	M	LEFT	×	✓	4	2	2	2	33	25	24	23
20	25	M	LEFT	×	✓	8	5	4	3	34	27	25	24
21	22	F	RIGHT	×	✓	6	4	3	2	35	26	26	25
22	38	F	RIGHT	×	✓	7	4	4	3	36	22	22	22
23	43	M	LEFT	×	✓	5	3	3	3	37	24	24	24
24	42	M	LEFT	×	✓	5	2	1	2	33	22	21	21
25	35	M	RIGHT	×	✓	6	2	2	2	31	25	22	22
26	24	F	RIGHT	×	✓	5	3	2	2	38	26	24	23
27	29	M	RIGHT	×	✓	5	4	2	2	35	21	21	21
28	48	F	LEFT	×	✓	6	3	3	2	36	20	20	21
29	31	F	RIGHT	×	✓	5	3	2	1	32	22	20	22
30	47	M	RIGHT	×	✓	7	4	3	2	34	24	23	23

**In Group A (n = 15): Patients Treated with PRP Injection:** Patients between 20 to 44 years were included with the mean age of 31.06 years. There were 9 females (60%) and 6 males (40%). Seven

patients (46.7 percent) had problems with their right elbow, while eight had problems with their left elbow (53.3 percent).



**FIG. 1: PRE INJECTION PRP VAS SCORE**



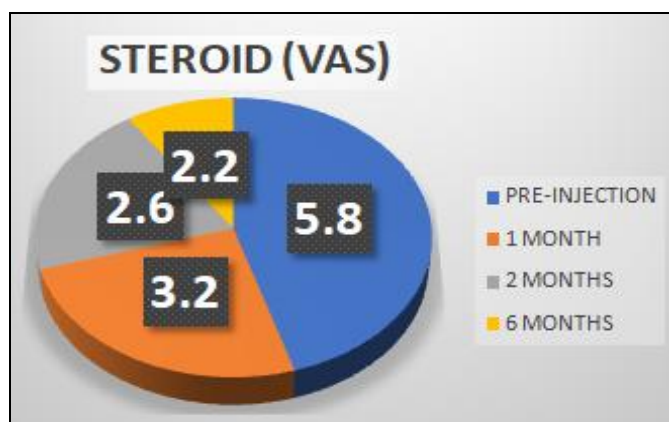
**FIG. 2: PRE INJECTION PRP DASH SCORE**

The mean Visual Analog Score (VAS) pre-PRP was 6.8, which improved to 1.93, 1.26, and 1.06 **Fig. 1** and the mean DASH score pre-PRP injection was 34.8, which improved to 11.8, 11.1, 10 **Fig. 2** at the end of 1<sup>st</sup>, 2<sup>nd</sup> and 6<sup>th</sup> months follow up respectively post PRP indicating statistically significant with  $P < 0.05$ . 1 patient had pain and infection resolved after 5 days of analgesics and oral antibiotics.

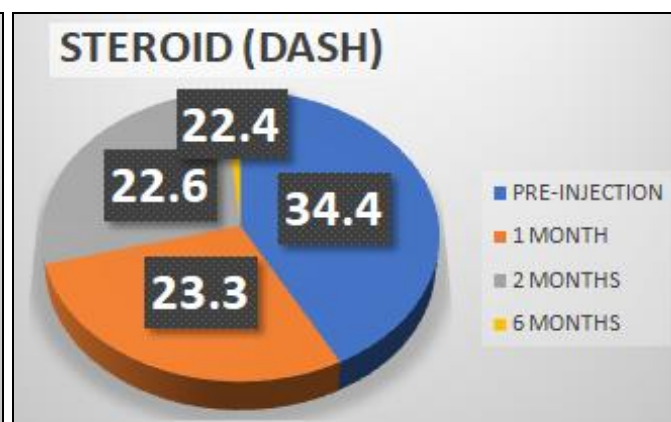
**In Group B (n = 15): Patients Treated with Steroid Injection:** Patients between 22 to 47 years were included with a mean age of 31.7 years. There were 8 females (53.3%) and 7 males (46.7%). Nine patients (60%) had problems with their right elbow,

while six had problems with their left elbow (40 percent). The mean Visual Analog Score (VAS) pre-steroid injection was 5.8, which improved to 3.2, 2.6, and 2.2 **Fig. 3** and the mean DASH score pre-steroid injection was 34.4, which improved to 23.3, 22.6, 22.4 **Fig. 4** at the end of 1<sup>st</sup>, 2<sup>nd</sup> and 6<sup>th</sup> months follow up respectively post steroid injection indicating statistically significant with  $P < 0.05$ . 1 patient had the complication of pain till 2<sup>nd</sup> day, which resolved spontaneously.

There were only minor complications in both the groups, and no major complications have been noted. None of the patients lost follow-up.



**FIG. 3: PRE INJECTION STEROID VAS SCORE**



**FIG. 4: PRE-INJECTION STEROID DASH SCORE**

**DISCUSSION:** Golfer's elbow, also known as medial epicondylitis, is tendinitis affecting the elbow. It appears when the forearm muscles' tendons meet the bony section of the elbow. Tendons are the connective tissue that connects muscles to bones. They might become swollen and painful due to any injury or irritation. Golfer's elbow, or medial epicondylitis, is a kind of epicondylitis. An overuse syndrome is caused by an eccentric overload of flexor-pronator mass on the medial epicondyle, which is classified as an overuse syndrome. This is caused by recurrent activities that cause micro-trauma to the flexor-pronator mass's insertion, which affects the pronator teres more than the flexor carpi radialis. Golfer's elbow is diagnosed clinically. Usually, patient complains of pain and tenderness in the medial epicondyle. Other than tenderness, provocative tests can be done to diagnose medial epicondylitis. Passive and active techniques can perform these tests. Treatment is mostly non-operative like rest, ice pack application, lifestyle

modifications, brace application, extracorporeal shock wave therapy. Rarely is surgical management used for patients with persistent symptoms despite non-operative management. Surgical management is open debridement of Pronator teres / Flexor carpi radialis and reattachment of the flexor-pronator group. Steroid, botulinum toxin, hyaluronic acid, and platelet-rich plasma (PRP) are among the injections used to treat medial epicondylitis (golfer's elbow). Platelets are cytoplasmic remnants of megakaryocytes formed in the bone marrow and measure around 2 micrometers in diameter. Studies state that platelets contain more than 30 bioactive proteins. These bioactive proteins have a fundamental role in the process of haemostasis and the process of tissue healing. According to the literature, platelets actively produce fundamental protein growth factors that start wound healing. Cell adhesion molecules in platelet-rich plasma include fibronectin, fibrin and vitronectin.

The degranulation phase, in which platelet granules fuse to the cell membrane and secretory proteins (e.g. PDGF, TGF-, etc.) are transformed to a bioactive state by adding histones and carbohydrate side chains is the beginning of PRP's mechanism of action. The active proteins secreted bind to the transmembrane receptors of the target cells, which include mesenchymal stem cells, fibroblasts, osteoblasts, endothelial cells, and epidermal cells, activating the intracellular signal protein, which causes the expression of a gene sequence that commands cellular proliferation, matrix formation, osteoid production, and collagen synthesis, resulting in tissue repair and regeneration. The platelets commence active secretion of the growth mentioned above factors after ten minutes of activation, with more than 95 percent of the pre-synthesized growth factors secreted within one hour. The major growth factors present are transforming growth factor-beta and vascular endothelial growth factors. It can promote the proliferation, recruitment, and differentiation of cells involved in the process of tissue repair and regeneration. Van Ark *et al.* has shown that the platelet-rich plasma provides pain relief in several chronic degenerative diseases, such as rotator cuff disease, osteoarthritis, and patellar tendinopathy.

Our study found that PRP injection significantly reduces pain in patients diagnosed with golfer's elbow (medial epicondylitis). Tarpada *et al.* state that when platelet-rich plasma injections are used to treat golfer's elbow (medial epicondylitis), the alpha granules present in the platelets include many growth factors that encourage the growth and healing of the damaged tissues<sup>11</sup>. He claims that high amounts of growth factors can help tissue repair and change the biomechanical and histological features of the afflicted tendons and tissues. According to Mautner *et al.*, when platelet counts with leukocytes are greater, and the pH is slightly higher, the injection is perfect for promoting tendon recovery<sup>12</sup>. Platelet-rich plasma can be used as an alternative treatment for surgical treatment. It has shown significant effects during the treatment of lateral and medial epicondylitis. Another added advantage of PRP is that it reduces the need for the use of narcotics, improves sleep, and reduces pain perception. Therefore, it helps to improve the quality of life of the patients. Corticosteroids have anti-inflammatory and

immunosuppressive properties, but their mechanism of action is unknown. Corticosteroids operate on nuclear steroid receptors, interrupting the inflammatory and immunological cascade processes at multiple levels. They lower vascular permeability and block the processes of inflammatory cell accumulation, phagocytosis, neutrophil superoxide generation, metalloprotease, and metalloprotease activator. They stop inflammatory mediators like prostaglandins and leukotrienes from forming and secreting. In our study, we measure the outcome of PRP injection and steroid injection in treating medial epicondylitis (golfer's elbow) patients in terms of pain and functional outcome using the VAS and DASH scoring system on 1<sup>st</sup>, 2<sup>nd</sup> and 6<sup>th</sup> months. The limitations of this study are that the sample size is small and there is a short follow-up time.

**CONCLUSION:** PRP injection is a viable treatment for medial epicondylitis and can be utilized in patients for whom other treatment options have failed. This form of treatment gives good functional outcomes without complications compared to steroid injection.

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**CONFLICTS OF INTEREST:** None to declare

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