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A comparative prospective study of platelet rich plasma vs corticosteroid injection in lateral epicondylitis

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Abstract
Introduction: Lateral epicondylitis, commonly referred to as 'tennis elbow' is seen to affect 1% to 3% of the general population in the 3rd and 4th decade of life. Treatment modalities for the treatment of lateral epicondylitis include analgesics and immobilisation. 90% of cases resolve spontaneously within 6-12 months.
Materials and Methods: Prospective comparative study performed at department of orthopaedics in Sri Lakshmi Narayana institute of Medical Sciences from August 2020 to November 2021, 40 patients (26 females and 14 males) were included in the study after explaining the procedure with consent by block randomization with 20 in each group.
Result: We included 40 patients in this study, 26 were females and 14 were males with chronic pain at elbow for more than 3 months not responding to 6 weeks of conservative management. Patient follow up was done at fourth, eighth and twelfth week of post injection. Mean VAS & DASH pre injection score average for platelet rich plasma group was 66.6 & 56.4 respectively while 36.5 & 29.1 at the end of one year treatment. Mean VAS & DASH pre injection score average for steroid group was 65.5 & 55.2 respectively while 37.8 & 34.0 at the end of one year treatment.
Conclusion: A single injection of autologous platelet rich plasma improves elbow pain and functional activities more effectively than corticosteroid injection in lateral epicondylitis.

Keywords: Tennis elbow, platelet richplasma, corticosteroid, lateral epicondylitis

Introduction
Lateral epicondylitis, commonly referred to as 'tennis elbow' is seen to affect 1% to 3% of the general population in the 3rd and 4th decade of life. It is one of the most common causes for elbow pain. The pathogenesis of an overuse injury is thought to be a result from cumulative micro trauma that weakens the structural and vascular elements of the tendon. Micro trauma to a mechanical structure occurs even if the loads are within the material's strength limits, and is due to fatigue after repetitive loads. If the muscle is weak or fatigued, the energy absorbing capacity of the whole muscle-tendon unit is reduced, and tendon stresses will increase. Treatment modalities for the treatment of lateral epicondylitis include analgesics and immobilisation. 90% of cases resolve spontaneously within 6-12 months. Other modalities include wrist bracing, elbow bracing, local corticosteroid injection, shockwave therapy and modifying poor technique in sport or work have been used in the treatment for Lateral Epicondylitis.

Materials and Methods
Prospective comparative study performed at department of orthopaedics in Sri Lakshmi Narayana institute of Medical Sciences from August 2020 to November 2021, 40 patients (26 females and 14 males) were included in the study after explaining the procedure with consent by block randomization with 20 in each group.

Inclusion criteria
Patients in the age group of 20-70 years
Patients with symptoms of lateral epicondylitis for more than

3 months not responding to 6 weeks of conservative management.

Exclusion criteria

Diabetic patients
Patients suffering with rheumatoid arthritis.
Patients with history of trauma or surgery to the lateral epicondyle
Patients who have previously received an injection at the lateral epicondyle in the last 3 months.
Patients suspicion of nerve involvement.

Methodology

1ml (40mg) of Triamcinolone acetonide was taken with 2ml of Lignocaine (1 %). It was injected in the maximum tenderness point deep into the tendon. The patient was then observed for 15 to 20 minutes and then discharged. The platelet rich plasma preparation has been done using desktop from the patient with 18 gauge needle. Blood is equally divided into three parts (nine ml each) which is then added to three pre filled test tubes, each containing one ml of 3.8% of sodium citrate solution. The blood is centrifuged at 1500 rpm for 15 minutes. By the end of the procedure the whole blood is separated into three layers such as platelet poor plasma (PPP), platelet rich plasma (PRP) and red blood cells (RBC). Platelet rich plasma is withdrawn from the middle layer and 3 – 4 ml of platelet rich plasma was prepared.

PRP Injection Technique

The procedure was done on an outpatient basis. Once the exact location was determined by assessing the maximum tenderness point clinically, the patient was injected with a local anesthetic drug (Lignocaine) under sterile technique.
Platelet rich plasma was injected with 3-4 ml platelet rich plasma, using a "peppering" technique in a clock wise manner to better cover the affected area of lateral epicondyle.

Post injection protocol

Since the patients may experience discomfort at the site of the injection for up to three days, they are advised to have ice fermentation over the injection site, limb elevation, activity modification and oral acetaminophen for pain relief.

Follow UP

All the patients were followed up at fourth, eighth and twelfth week of post injection.
One patient did not return for final follow up in platelet rich plasma (PRP) group. At follow up, pain was assessed according to Visual Analogue Scale (VAS) and Disabilities of the Arm, Shoulder and Hand (DASH) score and compared with pre injection score levels.
Final outcome was measured based on the pain reduction from the pre injection level. Patients were observed for post.

Results

The average Visual Analogue Scale (VAS) and Disabilities of the Arm, Shoulder and Hand (DASH) scores in both the groups of pre injection, four, eight and 12 weeks post injection are shown in the tables:

Table 1: Average Score of Platelet Rich Plasma Group

Pre Injection Score		Post Injection Score (4weeks)		Post Injection Score (8weeks)		Post Injection Score (12weeks)	
VAS	DASH	VAS	DASH	VAS	DASH	VAS	DASH
66.6	56.4	54.5	43.4	44.1	34.8	36.5	29.1

Table 2: Average Score of Steroid Group

Pre Injection Score		Post Injection Score (4weeks)		Post Injection Score (8weeks)		Post Injection Score (12weeks)	
VAS	DASH	VAS	DASH	VAS	DASH	VAS	DASH
65.5	55.2	47.6	42.0	43.3	35.8	37.8	34.0

Comparison of Results

For Platelet Rich Plasma Group

- The visual analogue scale (VAS) score is decreased by 30.1
- And the disability of arm, shoulder and hand (DASH) score is decreased by 27.3 at 12 weeks compared to the pre injection score.

For Corticosteroid Group

- The visual analogue scale (VAS) score is decreased by 27.7
- And the disabilities of the arm, shoulder and hand (DASH) score is decreased by 21.2 at 12 weeks compared to the pre injection score.

Complications

In steroid group one patient had paraesthesia at the injection site of elbow at fourth week post injection but it disappeared at twelfth week with observation. No case of infection, cellulitis was observed. No neurovascular injury noted.

Discussion

Nirschl observed that the basic pathology was in the origin of the extensor carpi radialis brevis (ECRB) tendon. But sometimes the anteromedial edge of extensor digitorum communis (EDC) and the deep surface of extensor carpiradialis longus (ECRL) may also be involved. In the study by Gosen *et al.* march 2011, compared the effectiveness of autologous platelet rich plasma injection to steroid injection therapy in lateral epicondylitis, it is proved that platelet rich plasma injection is safe and easy. Concerning functional impairment, the corticosteroid group showed better results during the initial period and then declined to baseline level. Whereas in platelet rich plasma group symptoms improved progressively. In the Mishra and Pavelko research, the success rate was 93% in the platelet rich plasma group and 65% success rate for steroid group in the Hay *et al.* study.

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