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Original Research Article

To Evaluate the Role of Intralesional Injection of Platelet-Rich Plasma versus Corticosteroid Injection in Lateral Epicondylitis

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Abstract:

Background and Aim: The disease is also known as 'tennis elbow' or lateral epicondylitis (LE). The disease affects between 1% and 3% of adults each year. It often occurs in patients between the ages of 35 and 50 years with high demands on gripping or repetitive wrist movements. A variety of treatment options are available to treat lateral epicondylitis, including analgesics and immobilization. Ninety percent of cases resolve spontaneously within 6-12 months. Other modalities include wrist bracing, elbow bracing, local corticosteroid injection, PRP injection shockwave therapy, and modifying poor technique in sports or work.

Material and Method: The study included 40 patients of lateral epicondylitis (fulfilling the inclusion criteria) who presented to the OPD/Casualty of Centre for bone and joints, Kokilaben Dhirubhai Ambani Hospital, Indore, between January 2023 and January 2024. The study was a prospective and interventional type. We tried to objectively determined the efficacy of two conservative treatment modalities, PRP injection and corticosteroid injection therapy in terms of DASH score and VAS score, in 40 patients with tennis elbow with 20 patients in each group

Results: With a mean age of 41.6 years (range: 21 to 56 years), 40 patients (group 1 PRP- 20 patients, group 2 CS -20 patients) had LE. There were 8 male patients and 32 female patients. The mean DASH Score dropped from the pre-procedure to the 6-month mark, demonstrating a noteworthy drop in the DASH Score and demonstrating the efficacy of 71.2 to 32.5 at the 6-month mark in the PRP group and 69 to 41.1 in the CS group and the Mean VAS Score dropped from the pre-procedure to the 6-month mark, demonstrating a noteworthy drop in the VAS Score and demonstrating the efficacy of 8.1±0.7 to 1.5±0.4 at the 6-month mark in the PRP group and 8±0.7 to 3.0±1.1 in the CS group.

Conclusion: PRP was associated with superior outcomes for reducing pain intensity and elbow joint function in the long term.

Keywords: Lateral Epicondylitis, Corticosteroid Injection (CS), Platelet-rich plasma (PRP), Visual Analog scale (VAS), Disabilities at the arm, shoulder and hand Questionnaire (DASH)

Introduction

The disease is also known as 'tennis elbow' or lateral epicondylitis (LE). The disease affects between 1% and 3% of adults each year. [1] It often occurs in patients between the ages of 35 and 50 years with high demands on gripping or repetitive wrist movements. [2] It is one of the most common causes of elbow pain. The pathogenesis of an overuse injury is thought to be a result of cumulative microtrauma that weakens the structural and vascular elements of the tendon. Muscle weakness or fatigue reduces the energy-absorbing capacity of the whole muscle-tendon unit, resulting in increased tendon stress. [3, 4]

Chronic Lateral Epicondylitis (pain lasting more than 3 months) is characterized by vasodilation and plasma extravasation without inflammatory cells.

A variety of treatment options are available to treat lateral epicondylitis, including analgesics and immobilization. 90% of cases resolve spontaneously within 6-12 months. Other modalities including wrist bracing, elbow bracing, local corticosteroid injection, shockwave therapy, and modifying poor

technique in sport or work [5], injection treatment have been used in the treatment of Lateral Epicondylitis. Corticosteroid injection has been used in the treatment of Lateral Epicondylitis. [6] However, the treatment with steroids is only seen as effective in early management. It also has adverse side effects like atrophy and permanent structural changes to the tendon.

Another method is Platelet Rich Plasma (PRP) injection which provides safe and natural healing. Platelets release many bioactive proteins responsible for attracting macrophages, mesenchymal stem cells, and osteoblasts which help with tissue regeneration and wound healing. Platelet-rich plasma (PRP) is defined as a volume of the plasma fraction of autologous blood having a platelet concentration above baseline. An increase in platelets of at least four times the baseline should be achieved. [7]

Materials and Methods

Total sample size in our study was 40. The data available for statistical analysis contained 20 patients in group 1 (platelet-rich plasma injection group) and 20 patients in Group 2 (corticosteroid injection group) with lateral epicondylitis who presented to the OPD/Casualty of the Centre for bone and joints, Kokilaben Dhirubhai Ambani Hospital, Indore, between January 2023 and January 2024.

The study was based purely on clinical observations so no specific investigations were done for outcome analysis. The study duration was 12 months with a minimum follow-up of 6 months. This was a prospective and interventional study. Patients were selected on an odd-even basis and were assessed according to a DASH score and Visual Analog Scale (VAS) score.

Those who fulfilled the following inclusion criteria were included in the study:

- The age of the patient is more than 18
- Clinical signs and symptoms of lateral epicondylitis with pain and tenderness in the lateral epicondyle.
- Patients with lateral epicondylitis who have undergone at least 4 weeks of conservative treatment.

Exclusion Criteria

- The age of the patient <18 years
- Hemorrhagic disorders
- On anticoagulant therapy
- Pregnancy
- Uncontrolled diabetes
- Bilateral lateral epicondylitis
- Patients with diagnosed RA or Infective arthritis.
- Post traumatic elbow joint pain and stiffness including intra-articular fractures and elbow dislocations.
- Infections & tumors.
- The patient is not willing to participate.

The selected patients who satisfied the above inclusion criteria were then registered, and all history and clinical details were recorded in the history sheet as per the proforma. Risks and benefits were thoroughly reviewed with the patient and informed written consent was obtained.

Procedure

The procedure was done on an outpatient basis and under complete aseptic conditions. The site of maximum tenderness was pre-marked with a sterile marker. Patients of Group 1 received 1 mL of PRP injection into the origin of the extensor of the forearm at the site of maximum tenderness by peppering technique (using a 20 gauge needle), i.e., spreading in a clockwise manner was used to achieve a more extensive zone of delivery, with a single skin portal and four to five passes through the fascia itself. Group 2 patients received 1 mL of a steroid (40 mg triamcinolone) by the same technique. Patients were rested for 15 min and then they were allowed to walk.

Post-injection Protocol

Following the injection procedure, patients are instructed to rest for a period of 15 minutes and apply ice for fomentation. They are then prescribed oral antibiotics for a duration of two days to prevent infection. To further mitigate infection risk, patients are advised to abstain from using hot tubs during the initial 24 to 48 hours post-injection. Tramadol or opiates are provided to alleviate any post-procedure soreness that may arise. It is emphasized that non-steroidal anti-inflammatory drugs (NSAIDs) should be avoided due to their potential to impair the inflammatory phase of healing.

In terms of functional results, patients' progress is assessed through the DASH score and VAS score. A follow-up protocol is established wherein patients are evaluated using the DASH score and VAS score preprocedural, as well as at 2 weeks, 4 weeks, 12 weeks, and 24 weeks following the procedure. This comprehensive follow-up regimen enables thorough monitoring of patients' recovery and functional outcomes over time.

Results

With a mean age of 41.6 years (range: 21 to 56 years), 40 patients (group 1 PRP- 20 patients, group 2 CS -20 patients) had LE. There were 8 male patients and 32 female patients. Eleven patients had LE on the left side and 29 had LE on the right. With a range of 6 to 12 months, the follow-up length was 7.3 months on average. There were no co-

morbidities in 35 patients. Two patients had diabetes mellitus and three individuals had concomitant hypertension.

DASH Score

To compare the effectiveness of intralesional PRP injection versus CS in LE, DASH scoring was used. At two weeks, four weeks, twelve weeks, and twenty-four weeks following the PRP injection, the mean pre-procedure DASH score of 71.2 ± 6.3 improved to 53.1 ± 6.5, 40.2 ±4.8, 34.3 ±4.8, and 32.5 ± 4.2, respectively (table 2).

At two weeks, four weeks, twelve weeks, and twenty-four weeks following CS injection, the mean pre-procedure DASH score of 69.0 ±6.8 in the CS group improved to 41.2 ± 6.5, 34.4 ± 4.2, 35.1 ± 3.6, and 41.1 ± 1.5.

Thus, the Mean DASH Score dropped from the pre-procedure to the 6-month mark, demonstrating a noteworthy drop in the DASH Score and demonstrating the efficacy of 71.2 to 32.5 at the 6-month mark in the PRP group and 69 to 41.1 in the CS group.

Table 1: Comparing DASH score between groups

Assessment	PRP	CS	P VALUE
Pre-injection	71.2±6.3	69.0±6.8	0.392
Post injection			
2 Weeks	53.1 ± 6.5	41.2 ± 6.5	0.000
4 Weeks	40.2±4.8	34.4 ± 4.2	0.004
12 Weeks	34.3 ±4.8	35.1 ± 3.6	0.712
24 Weeks	32.5 ± 4.2	41.1 ± 1.5	0.011

Table 2: Comparing p value for DASH score between groups

P Value	PRP	CS
Pre-injection Vs 2 weeks	< 0.001	<0.001
2 weeks Vs 4 weeks	<0.001	0.01
4 weeks Vs 12 weeks	0.006	0.311
12 weeks Vs 24 weeks	0.431	0.071
Pre-injection Vs 24 weeks	0.001	<0.001

VAS score

The Visual Analog Scale is a validated, subjective measure of acute and chronic pain which is recorded by making a mark on a line that represents a continuum between 'no pain' and 'worst pain'. To assess the effectiveness of intralesional PRP injection versus CS injection in Lateral Epicondylitis, we routinely took VAS scores before and following the procedure at two, four, twelve, and twenty-four weeks. At two weeks, four weeks, twelve weeks, and twenty-four weeks following PRP injection, the mean pre-procedure VAS score of 8.1± 0.7 improved to 5.5 ± 1, 3.6 ±0.6, 2 ±0.8, and 1.5 ±0.4. In the CS group, after 2 weeks, 4 weeks, 12 weeks, and 24 weeks following CS injection, the mean pre-procedure VAS score of 8± 0.7 improved to 3± 1, 2.4 ± 0.5, 1.9± 0.5, and 3± 1.1 and the Mean VAS Score dropped from the pre-procedure to the 6-month mark, demonstrating a noteworthy drop in the VAS Score and demonstrating the efficacy of 8.1±0.7 to 1.5±0.4 at the 6-month mark in the PRP group and 8±0.7 to 3.0±1.1.

Table 3: Comparing VAS score between groups

Assessment	PRP	CS	P VALUE
Pre-injection	8.1±0.7	8±0.7	0.720
Post injection			
2 weeks	5.5 ± 1	3± 1	0.00
4 weeks	3.6± 0.6	2.4 ± 0.5	0.00
12 weeks	2± 0.8	1.9 ± 0.5	0.513
24 weeks	1.5 ± 0.4	3.0 ± 1.1	0.001

Table 4: Comparing P value for VAS score between groups

P Value	PRP	CS
Pre-injection Vs 2 weeks	< 0.001	<0.001
2 weeks Vs 4 weeks	<0.001	0.014
4 weeks Vs 12 weeks	0.001	0.102

12 weeks Vs 24 weeks	0.411	0.003
Pre-injection Vs 24 weeks	<0.001	<0.001

As a result, the DASH score and VAS score were significantly reduced (P <0.001) at 6 months as compared to pre-procedure and thus proved the effectiveness of the PRP therapy. It also shows that PRP is a better method of reducing pain in lateral epicondylitis compared to steroid injection.

One patient reported experiencing discomfort at the injection site, and another patient experienced a superficial infection at the injection site that was treated with antibiotics. There were no problems in 38 patients.

Discussion

Although 80–90% of patients recover on their own after 1-2 years, the disorder appears to have a favorable natural course. However, there is a dearth of scientific information regarding the disease's natural history. [8] In most circumstances, lateral epicondylitis is a self-limiting illness that goes away on its own without the need for surgery in about 90% of cases within a year. [9] My research's findings demonstrated that PRP is superior to steroid injections in managing and lessening pain in individuals with lateral epicondylitis of the humerus, or tennis elbow. To address the patient's pain concerns, PRP injections ought to be a regular part of treatment for tennis elbow.

In our study a mean age of 41.6 years (range: 21 to 56 years), 40 patients (group 1 PRP- 20 patients, group 2 CS -20 patients) had LE. There were 8 male patients and 32 female patients. Eleven patients had LE on the left side and 29 had LE on the right. With a range of 6 to 12 months, the follow-up length was 7.3 months on average. The mean DASH Score dropped from the pre-procedure to the 6-month mark, demonstrating a noteworthy drop in the DASH Score and demonstrating the efficacy of 71.2 to 32.5 at the 6-month mark in the PRP group and 69 to 41.1 in the CS group and the Mean VAS Score dropped from the pre-procedure to the 6-month mark, demonstrating a noteworthy drop in the VAS Score and demonstrating the efficacy of 8.1±0.7 to 1.5±0.4 at the 6-month mark in the PRP group and 8±0.7 to 3.0±1.1 in the CS group. We found that although both the groups showed improvement initially, patients who received PRP injections were found to have significantly improved pain scores at 6 months compared to the steroid group

A comprehensive review and network meta-analysis of randomized controlled trials were done by Krogh et al. [10] to compare the efficacy of injectable treatments for lateral epicondylitis. Their findings do not support our findings, claiming that PRP and steroids are equally effective at relieving pain.

A randomized control experiment was carried out by Omar et al. [11] to treat plantar fasciitis and lateral epicondylitis locally by injecting corticosteroids and autologous platelet-rich plasma. Their findings showed that the pain score was 4.32.1 with steroids and 3.8 and 1.9 with PRP. They concluded that treating tennis elbow patients locally with autologous platelet-rich plasma (PRP) injections showed promise.

Peerbooms et al. [12] involved 100 participants (49 CS and 51 PRP). Based on visual analog scores, the outcomes demonstrated a significant difference (P <.001) between the groups: 24 of the 49 patients (49%) in the corticosteroid group and 37 of the 51 patients (73%) in the PRP group had successful outcomes. Additionally, a significant difference (P =.005) was observed in the DASH scores, which showed that 37 of the 51 patients (73%) in the PRP group and 25 of the 49 patients (51%) in the corticosteroid group were successful. When compared to the PRP group, the corticosteroid group showed improvement at first, but it later declined.

Gosens et al [13] researched 100 patients (49 CS and 51 PRP). An ongoing, double-blind, randomized controlled experiment with a 2-year follow-up found that platelet-rich plasma injection was superior to corticosteroid injection in treating lateral epicondylitis. According to their findings, the PRP group received more effective treatment than the corticosteroid group more frequently (P <.0001). A 25% decrease in VAS or DASH scores without the need for reintervention after two years was considered a success. To treat lateral epicondylitis of the humerus, Yadav et al [14] compared the effects of corticosteroids and local injections of platelet-rich plasma. They discovered that the mean pain score for the PRP group was 1.6 and for the steroid group was 2.8. They concluded that PRP and steroid injections work well together to treat lateral epicondylitis. But because PRP works so long, it's a better option for treatment.

Gautam et al. [15] 30 participants were used in the trial (15 PRP vs 15 CS). In the PRP and CS groups, there was a substantial improvement in the pain VAS, DASH score, Oxford Elbow score, modified Mayo score, and hand grip strength from pre-injection to the 6-month follow-up. In contrast, the CS group's scores often peaked at three months and subsequently significantly declined at six months, indicating a return of symptoms.

Conclusion

When treating lateral epicondylitis, a single CS injection or PRP injection has been shown to have great efficacy and safety. It is a quick, easy, and low-

risk technique that requires no surgical expertise and can be performed in the outpatient department (OPD) with little risk of serious side effects. While CS appeared to offer temporary symptom alleviation but led to tendon deterioration, PRP seemed to facilitate biological repair of the lesion. Long-term effects for improving elbow joint function and lowering pain severity were found to be better with PRP

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