

Original Research Article

## **Injection of Autologous Blood versus Corticosteroid Injection in the Treatment of Tennis Elbow: A Prospective Randomized Comparative Study**

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### **ABSTRACT**

**Introduction:** Lateral epicondylitis, or tennis elbow, is commonly encountered in orthopaedic practice. The characteristic clinical findings are pain and tenderness over the lateral epicondyle. Lateral epicondylitis has been reported to be the result of overuse from many activities. Although it is often referred to as tennis elbow, it is seen to affect non-athletes rather than athletes.

**Methods:** A total of 50 patients were included in this prospective randomised study: 25 patients received 2 ml autologous blood drawn from contralateral upper limb vein and 25 patients received 2 ml (80 mg) of methylprednisolone injections at the lateral epicondyle. Outcome was measured using a VAS score and Nirschl staging of lateral epicondylitis. Follow-up was continued for total of six months, with assessment at 1 week, 2 months and 6 months.

**Results:** The severity of pain was measured pre-injection and after 1 week, 2 months and 6 months by the VAS for pain and Nirschl staging in all the patients. The result of the VAS for pain and Nirschl grades followed a remarkably different course over the period of follow-up in the two groups.

**Conclusions:** Autologous blood injection is efficient compared with corticosteroid injection, with less side-effects and minimum recurrence rate.

**Keywords:** Lateral epicondylitis, Local corticosteroid, Autologous blood injection, Elbow.

### **INTRODUCTION**

Tennis elbow is also known as lateral epicondylitis, tendinopathy or lateral epicondylalgia is a common musculoskeletal problem also defined as an enthesopathy of the extensor carpi radialis brevis origin. [1] Lateral elbow tendinopathy is the most appropriate diagnostic term for lateral epicondylitis. [2] The term lateral epicondylitis is now being considered a misnomer because of the lack of inflammatory signs. The condition affects 1-3% of the total population, with peak incidence in patients within the age group of 35-55 years. Male and female population is equally affected. [3-6] The disease is usually

self limiting lasting 6 to 24 months. In Only 20% of the patients does the disease persist for more than a year. [7] Multiple treatment modalities conservative and surgical have been described for tennis elbow. Conservative treatments include rest, analgesics, anti-inflammatory medication, use of orthotic devices, eccentric exercise and physiotherapy. Local injection of steroids, autologous blood, platelet rich plasma, sodium hyaluronate injections, and extracorporeal shock wave therapy are being used. Surgical methods include percutaneous needling, tenodesis, or open and arthroscopic release of the extensor carpi radialis brevis tendon. The commonest

mode of treatment for the lateral epicondylalgia is being the local injection of steroid, which has been shown to be quite effective atleast in the short term. [8] Autologous blood injection has also been shown in few studies to be better modality for the treatment of lateral epicondylalgia. [9] Few studies demonstrated better outcomes with the injection of autologous blood as compared to the steroid group [10,11] Although some randomised studies on the other side do not show a difference of outcomes in placebo, steroid and autologous blood injections. [12] The purpose of this randomized study was to compare the short term outcomes of steroid injections with autologous blood injections.

## MATERIALS AND METHODS

The study was conducted in Government Medical College-Srinagar from January 2017 to July 2017, with prior approval from the ethical committee of the hospital. All patients were informed regarding the study beforehand and written consent obtained from all. During the above said period 50 adult patients were diagnosed with tennis elbow who had failed to improve with conservative trial involving two week course of NSAIDS, tennis elbow brace, U.S. massage and eccentric exercise. Patients were randomly allocated in two groups with 25 each. Group A was given 2 ml of autologous blood taken from any vein of the other limb, while group B was given 2ml (80 mg) of methylprednisolone injection, no local anaesthetic injection was administered along with the injection to avoid any interference in the study results. Post-injection all the patients were given small sterile dressing over the injection prick site without any bulky dressing. Patients were advised to continue with the tennis elbow brace for few days, until pain gets relieved (5-7 days). All patients were asked to follow up after 1 weeks, 2 months and 6 months. All patients were assessed by 10 Point VAS and 7 phase Nirschl staging at presentation and at every follow-up.

Statistical analysis was done by using SPSS-10 software.

### Inclusion criteria:

Pain and tenderness over lateral aspect of the elbow with one among the following tests being positive - cozens test, Mill's maneuver, broom test etc.

### Exclusion criteria:

Age below 18 years, history of surgery on lateral side of elbow, history of any previous injection for lateral epicondylitis, presence of other causes of elbow pain such as elbow joint osteoarthritis, osteochondritis desicans, cervical radiculopathy, epiphyseal plate injuries, varus instability, posterior interosseous nerve syndrome, chronic regional pain syndrome.

## RESULTS

A total of 50 patients were included in the study with 25 in group A and 25 in group B. 2 patients from group A and 1 patients from group B were lost in the follow-up, leaving a total of 23 in group A and 24 in group B. The demographics of the patients of the two groups are given in table 2.

Table 1. Details of the Nirschl staging system

Phase Description
1 Mild pain with exercise, resolves within 24 hours
2 Pain after exercise, exceeds 48 hours
3 Pain with exercise, does not alter activity
4 Pain with exercise, alters activity
5 Pain with heavy activities of daily living
6 Pain with light activities of daily living, intermittent pain at rest
7 Constant pain at rest, disrupts sleeps

Table 2: Baseline clinical and demographic characteristics of each group.

	Group-A (n=23)	Group-B (n=24)	p-value
Age (yrs)	38.434	36.958	0.522
Laterality (R/L)	18/5	21/3	0.399
Sex (M/F)	8/15	8/16	0.916
Mean duration of symptoms (wks)	7.08	8.66	0.077
Mean VAS score	7.08	7.54	0.070
Mean Nirschl stage	5.41	5.95	0.005

Table 3: Mean Visual Analogue Scale (VAS) for pain in group A and group B.

Follow-up	Group A Mean (SD)	Group B Mean (SD)	p- value
Pre-injection	7.08(0.99)	7.54(0.73)	0.070
1 week	5.62(1.15)	1.60(1.19)	<0.001
2 months	0.08(0.28)	0.34(0.77)	0.138
6 months	0.73(1.21)	1.60(2.18)	0.208

**Table 4: Mean Nirschl Staging for group A and group B.**

Follow-up	Group A Mean (SD)	Group B Mean (SD)	p- value
Pre-injection	5.41(0.50)	5.95(0.76)	0.005
1 week	4.73(0.61)	1.65(1.46)	<0.001
2 months	0.08(0.28)	0.17(0.57)	0.521
6 months	0.65(1.15)	1.34(1.82)	0.278

Group A comprised of 8 male and 15 female patients with the mean age of 38.4 years (21-51 yrs) and group B comprised 8 males and 16 females with a mean age of 36.9 years (24-56 yrs). The baseline characteristics of both groups like demographics (age, sex, laterality) and clinical data like VAS score and Nirschl staging and occupational characteristics are shown in table 2 and table 3, which are comparable, as per the statistical tests with P value being insignificant. The severity of pain was measured pre-injection and after 1 week, 2 months and 6 months by the VAS for pain and Nirschl staging in all the patients. The result of the VAS for pain and Nirschl grades followed a remarkably different course over the period of follow-up in the two groups.

When we see the groups individually in the group A the pre injection VAS score was 7.08(0.99) which when compared to the 1 week post injection VAS score of 5.62 (1.15) showed a decrease in the pain level in almost all patients but the fall was not significant as analysed by P value. Similar was the case with the Nirschl staging. The mean Nirschl staging value in the pre-injection case was 5.43(0.50), which decreased to mean value of 4.73(0.61) at one week follow-up post autologous blood injection but the fall was not significant when compared by P value. Though when we saw the patients on 2 months of follow up the mean VAS Score has fallen to 0.08(0.28) and the mean Nirschl staging score has fallen to 0.08(0.28) both of which are highly significant as per the P value. On 6 month follow up the mean VAS score and mean Nirschl staging score were 0.73(1.21) and 0.65(1.15), respectively which are markedly lower than the pre-injection values and the results are highly significant as per the P value. But if we compare the

mean values at 2 months and 6 months there is an increase in the mean value which was due to recurrence/persistence of symptoms in few patients, though the VAS and Nirschl values were far less than the pre-injection rates, and this was responsible for the rise in the mean pain after 6 months.

When we analyse the group B result statically we find the mean VAS and Nirschl staging score which was 7.52(0.73) and 5.95(0.76) respectively before the injection of the drug has fallen to the mean VAS of 1.60(1.19) and mean Nirschl score of 1.65(1.46) at 1 week of follow-up, these values show significant decrease in the levels as per the P value. The mean values have further fallen at 2 months follow up with mean values of 0.34(0.77) and 0.17(0.57) each respectively for VAS and Nirschl staging scores. But at 6 months follow-up the mean values of VAS was 1.60(2.18) which is slightly higher than what was at 2 months follow up but this was insignificant as per the p value. At 6 months follow-up the mean Nirschl value was 1.34(1.82) which also is slightly higher than what it was at 2 months follow-up, though the value is insignificant as per the P value. The higher value at 6 month follow up was due to recurrence of symptoms in few patients, though the values of VAS and Nirschl were lower than what it was at pre-injection rates.

On comparing the results of the two groups we find the mean VAS of 7.08(0.99) in group A and mean VAS of 7.52(0.73) in group B at pre-injection stage which is comparable and insignificant as per p value. Similar is the case with Nirschl staging at pre-injection stage between the two groups with values of 5.43(0.50) and 5.95(0.76) for the group A and group B respectively. At one week of follow-up the mean VAS of group A was 5.62(1.15) and that of group B was 1.60(1.19) which is significant as per the p value, similarly the Nirschl score for group A was 4.73(0.61) and for group B was 1.65(1.46), showing thereby that the steroid group has shown better response to drug at 1 week follow up. At 2 months

follow up the mean VAS for group A was 0.08(0.28) and for group B was 0.34(0.77) and the mean Nirschl score for group A and group B were 0.08(0.28) and 0.17(0.57) respectively, so the mean score was lesser for autologous blood group but the results when compared by p value were statistically insignificant, showing thereby the results are comparable between steroid and autologous blood group. At 6 months follow up the mean VAS score for group A was 0.73(1.21) and mean VAS score for group B was 1.60(2.18) which is insignificant as per p value. Though the mean VAS and Nirschl is better for the autologous blood group than the steroid group because of more recurrences but p value is insignificant.

## DISCUSSION

Lateral elbow tendinopathy is primarily a disorder related to degeneration in the tendon of extensor carpi radialis brevis rather than inflammatory process. Tendinopathy is a clinical diagnosis while tendinitis and tendinosis should be reserved as a histopathological diagnosis. [13] The mean age of the patients in our study was 38 yrs, many other studies show the mean age of 42 years. [14-16] Lateral elbow tendinopathy has been a baffling disorders with no consensus whatsoever regarding its treatment. Tonks et al suggested a large number (70-80%) of patients report self resolution of symptoms without treatment. [8] Various types of treatments have been tried in the treatment of elbow tendinopathy, like conservative with rice regimen, NSAIDS, manipulative therapy, pulsed ultrasound, exercises and braces, followed by injection therapies e.g. steroids, autologous blood, platelet rich plasma, hyaluronic acid, botulinum toxin, dry needling etc followed by surgical release of lateral epicondylar tendons. [16-22] The current study was done to compare the effects of steroid with the autologous blood injection therapy. Tonks et al showed marked decrease in pain with steroids injections in the short term, in lateral elbow tendinopathy, while some studies like

Lindenhovius A, et al reported that outcomes may be due to the placebo effect of injection itself or a reflection of concurrent resolution of a self-limited disease. [12] The study by Edward et al indicated dramatic pain relief in 28 patients of tennis elbow after injection of autologous blood. [9] However, Vos et al in his systematic review found little role of autologous blood in the treatment of tendinopathies. [23] Lee TG et al in their study involving comparison of autologous blood and steroid in the treatment of plantar fasciitis showed comparable results of pain relief and tenderness with steroid injection showing early onset of pain relief. [24] J.M. Wolf et al in their prospective randomized controlled trial comparing autologous blood steroid with saline injections found no difference between the three groups over a 6 month period. [25] These results are comparable with the results of our study where both the groups showed increased outcome over a period of 6 months though the results were comparable but the steroid group showed early resolution of pain and tenderness while the autologous blood showed lesser recurrence rates.

**Conflict of Interest:** None

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