

COMPARITIVE STUDY OF LOCAL STEROID INJECTION VERSUS AUTOLOGOUS BLOOD INJECTION THERAPY FOR THE MANAGEMENT OF LATERAL EPICONDYLITIS

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ABSTRACT: OBJECTIVES: Local corticosteroid infiltration is a common practice of treatment for lateral epicondylitis. In recent studies no statistically significant or clinically relevant results in favour of corticosteroid injections were found. The injection of autologous blood has been reported to be effective for both intermediate and long-term outcomes. It is hypothesized that blood contains growth factors, which induce the healing cascade. **METHODS:** A total of 50 patients were included in this prospective randomized study. Patients were divided in 2 groups of 25 patients each. Group I received 2 ml local corticosteroid +1 ml 2% lignocaine, Group II received 2 ml autologous blood drawn from ipsilateral upper limb vein +1 ml 2% lignocaine, and at the lateral epicondyle. Outcome was measured using a pain score (VAS). Follow-up was continued for total of six months. **RESULTS:** The corticosteroid injection group showed a statistically significant decrease in pain compared with autologous blood injection group at six weeks follow up. At final six-month follow-up, autologous blood injection group showed statistically significant decrease in pain compared with corticosteroid injection group. **CONCLUSIONS:** Autologous blood injection is efficient compared with corticosteroid injection, with less side-effects and minimum recurrence rate in long term.

KEYWORDS: Lateral epicondylitis, Local corticosteroid, Autologous blood injection, Elbow.

INTRODUCTION: Lateral epicondylitis, or tennis elbow, is commonly encountered in orthopaedic practice, being the second most frequently diagnosed musculoskeletal disorder in the neck and upper extremity in a primary care setting.¹ It has an incidence of between 4-7 per 1000 cases per year in general practice, with a peak between the ages of 35 and 54 years, and a mean age of approximately 42 years. An epidemiological study reported that 87% of cases involved the dominant arm.²

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.^{3,4}

The pathophysiology of the condition is a matter of controversy, and there is not enough scientific evidence to favour any particular type of treatment for acute lateral epicondylitis.^{5,6} Most current research has proposed degeneration of the origin of the extensor carpi radialis brevis and repeated microtrauma and incomplete healing response (Tendinosis) as the cause of lateral epicondylitis.⁷⁻¹¹ The constellation of findings has been termed angiofibroblastic hyperplasia.¹²

Most conservative modalities such as local injection of corticosteroid have focused on suppressing an inflammatory process that does not actually exist. It is theorized that the beneficial effects of the steroid injection result from the bleeding caused by forcing fluid through tissue planes at high pressures.¹³

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Recently an injection of autologous blood has been reported to be effective for both intermediate and longterm outcomes for the treatment of lateral epicondylitis, with a significant decrease in pain.^{6,11,14} Chemical modifiers of cellular activity carried in the blood and are known to be mitomorphogenic.¹² Injection of autologous blood might provide the necessary cellular and humeral mediators to induce a healing cascade.⁶

There are very few studies that have evaluated the injection of autologous blood for lateral epicondylitis as a treatment modality. The objective of this study was to evaluate the efficacy and role of autologous blood injection for the treatment of lateral epicondylitis, compared with the commonly used local injection of corticosteroid.¹⁵⁻¹⁸

MATERIAL AND METHODS: This study was conducted at the Department of Orthopaedics, Guru Nanak Dev Hospital, Government Medical College, Amritsar. Patients attending outpatient department were included after a diagnosis of lateral epicondylitis was established. The exclusion criteria were: 1) patients receiving steroid injections in the three months prior to study treatment; 2) history of substantial trauma; 3) previous surgery for lateral epicondylitis; 4) coexisting pathology like rheumatoid arthritis of elbow, cervical disc syndrome. Patients were allotted sequentially into two parallel groups, I and II, of 25 cases each. Equal randomization (1:1 allocation ratio) was undertaken according to a computer-generated randomization table.

PROCEDURE: Group I was designated to receive an injection of local corticosteroid. Patients were infiltrated with 2 ml of methyl prednisolone acetate 40 mg mixed with 1 ml 2% lignocaine, at the lateral epicondyle. Group II was designated to receive an injection of autologous blood. Patients were infiltrated with injection of 2 ml autologous blood drawn from the ipsilateral upper limb vein mixed with 1 ml 2% lignocaine, at the lateral epicondyle according to the technique described below. Three such injections were given at 2 weeks interval.

Technique⁶: With the patient in supine or sitting posture the elbow is flexed to 90° with the palm facing down. The anatomical bony landmarks were identified. Under aseptic precautions the needle is introduced proximal to the lateral epicondyle along the supracondylar ridge, and gently advanced in to the undersurface of the extensor carpi radialis brevis while infiltrating. A small adhesive sterile dressing is applied. Patients are advised to rest the upper limb for three days, with no restriction of activity after that.

Outcome and Evaluation: Outcome in terms of pain relief was assessed using a visual analogue scale (VAS).⁶ The VAS comprised a 10 cm line marked at one end with 'no pain' and at other end with 'worst pain ever'. The participant is asked to indicate where on the line he or she rates the pain on the day of presentation.

Statistical Analysis: The Chi square test was used to compare outcome regarding pain between the two groups and compare other categorical variables between the groups. A p-value <0.05 was considered to indicate statistical significance.

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RESULTS: In our study, group I comprised 15 males and 10 female patients and group II comprised 12 males and 13 females. The mean age was of 41.7 years (25 to 67). Among the 50 patients 48(96%) had right side involvement and only 2(4%) had left elbow. At 6 week follow up (Table no. 1), on comparison between two groups using chi-square test for p value, the chi square (X^2) calculated was 12.811 and p value was 0.005, which was statically significant indicating short term efficacy of steroid injection over autologous blood injection therapy in relieving the patient's pain. At 3 month follow up (Table no. 2), on comparing the chi square (X^2) calculated was 3.020 and p value was 0.389, indicating insignificant difference between the two groups. At final 6 month follow up (table no.3) , on comparison between two groups using chi-square test for p value, the chi square(X^2) calculated was 14.558 and p value was 0.002 disproving null hypothesis showing highly significant difference showing long term efficacy of autologous blood injection over steroid injection therapy.

No systemic adverse effect was reported. In group I 1(4%) patient post injection flare and 1(4%) patient had skin\fat atrophy. In group II 1(4%) patient had superficial skin infection, which subsided by a course of oral antibiotic. No patient reported elbow stiffness, reflex sympathetic dystrophy, facial flushing, neurovascular damage or tendon rupture or other untoward complications.

Grades of results	Group I (n = 25)						Goup II (n=25)					
	Male		Female		Total		Male		Female		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Excellent (VAS = 0)	3	12.0	1	4.0	4	16.0	-	-	-	-	-	-
Good (VAS = 0-30)	10	40.0	8	32.0	18	72.0	5	20.0	6	24.0	11	44.0
Fair (VAS = 30-60)	1	4.0	1	4.0	2	8.0	5	20.0	4	16.0	9	36.0
Poor (VAS = 60-100)	1	4.0	-	-	1	4.0	2	8.0	3	12.0	5	20.0

TABLE No. 1: GRADES OF RESULTS AT 1.5 MONTH FOLLOW-UP

$X^2 = 12.811$ df = 3 p = 0.005; Significant.

Grades of results	Group I (n = 25)						Goup II (n=25)					
	Male		Female		Total		Male		Female		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Excellent (VAS = 0)	1	4.0	-	-	1	4.0	1	4.0	2	8.0	3	12.0
Good (VAS = 0-30)	7	28.0	6	24.0	13	52.0	8	32.0	7	28.0	15	60.0
Fair (VAS = 30-60)	4	16.0	3	12.0	7	28.0	3	12.0	3	12.0	6	24.0
Poor (VAS = 60-100)	3	12.0	1	4.0	4	16.0	-	-	1	4.0	1	4.0

TABLE No. 2: GRADES OF RESULTS AT 3 MONTH FOLLOW-UP

$X^2 = 3.020$; df = 3; p = 0.389; Not Significant.

Grades of results	Group I (n = 25)						Goup II (n=25)					
	Male		Female		Total		Male		Female		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Excellent (VAS = 0)	-	-	-	-	-	-	2	8.0	3	12.0	5	20.0
Good (VAS = 0-30)	7	28.0	4	16.0	11	44.0	8	32.0	9	36.0	17	68.0
Fair (VAS = 30-60)	5	20.0	3	12.0	8	32.0	2	8.0	1	4.0	3	12.0
Poor (VAS = 60-100)	3	12.0	3	12.0	6	24.0	-	-	-	-	-	-

TABLE No. 3: GRADES OF RESULTS AT 6 MONTHS FOLLOW-UP

$\chi^2 = 14.558$; $df = 3$; $p = 0.002$; Significant.

DISCUSSION: Lateral epicondylitis (tennis elbow) is the most frequently reported elbow problem. It is commonly seen in the athletic enthusiast sportsperson, but is also common in various other individuals who do not participate in sports.

In our series there were 54% male and 46% female patients with the age group varying from 25 to 67 years and an average age of 41.7 years. A study by Hamilton included a population with age ranging between 14 and 78 years with a mean age of 45 years. In our series amongst 50 enrolled patients, 48(96%) showed involvement of right elbow and 2(4%) showed involvement of left side. All showed affection of their dominant side. Literature mentions that the dominant arm is commonly affected.^{19,20}

Assendelft et al, in their 1996 systematic review, compared the validity and outcome of randomised controlled trials of corticosteroid injections for lateral epicondylitis. Pooled analysis indicated short-term effectiveness only (two to six weeks). At follow-up >six weeks, no difference was found between corticosteroid injection and other treatments, including placebo. No conclusions could be made about the most suitable corticosteroid, dose, injection interval or volume.²¹ Bisset et al concluded that physiotherapy combining elbow manipulation and exercise has a superior benefit to 'wait-and-see' in the first six weeks and to corticosteroid injections after six weeks. The significant short-term benefits of corticosteroid injection are paradoxically reversed after six weeks, with high recurrence rates, implying that this treatment should be used with caution in the management of tennis elbow.²² These are comparable to our results, which by 12 weeks were showing a slight reversal of the early pain relief in the corticosteroid group, with high rates of recurrence.

Studies on animal models have shown that intratendinous corticosteroid adversely affect the biomechanical properties of tendons.²³⁻²⁶ Corticosteroid injection has also been associated with side-effects such as sepsis, tendon rupture, post-injection pain, local skin atrophy, facial flushing, post-injection flare, hyperglycaemia and hypersensitivity reactions.^{4,17,26-28} Resuscitation facilities should be available in case patients have a rare severe reaction.

Edwards and Calandruccio, investigating autologous blood injections in 28 patients in whom conservative therapy had failed to resolve symptoms of lateral epicondylitis, found that 22 patients

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(79%) had a reduction in pain over 9.5 months post-injection. All patients maintained their maximal benefit throughout the course of their follow-up evaluation, with no recurrence.⁶ There are very few studies in the literature comparing the efficacy of injection of autologous blood with injection of local corticosteroid for lateral epicondylitis.^{28,29}

There are studies with more than one injection of autologous blood and local corticosteroid in patients who had suboptimal relief of symptoms after the initial injection.^{6,14,15,21,22} The optimal interval between autologous blood injections is unknown, but postulated to be six weeks, with up to three injections. The time required to reach maximal benefit after the repeat injection was on average shorter (one to two weeks) than after the initial injection – possibly because the healing cascade was already underway.^{6,14}

In our study group I showed a statistically significant decrease in VAS score at six weeks compared with group II. Hay et al³⁰ found similar results when local corticosteroid injection was compared with oral naproxen. At six months, we found that significantly more of group II had complete relief of pain compared with group I (88% versus 44%). Edwards and Calandruccio⁶ found that 22 of 28 patients (79%) were relieved completely of pain with autologous blood injections. Despite good early results, with a rate of complete pain relief of 88% at six weeks, we found the corticosteroid group more likely to experience recurrence of pain, by final follow-up at six months. Bisset et al²² described 72% recurrence after three to six weeks on longer follow-up.

CONCLUSION: Autologous blood injection demonstrated statistically significant lower pain compared with corticosteroid injection group at long-term follow-up (six months), with 88% of patients in this group having complete relief of pain. Corticosteroid injection group showed early decrease in pain compared to autologous blood injection group but the short-term benefits of corticosteroid injection were followed by high rates of recurrence.

This study offers encouraging results of an alternative treatment that addresses the pathophysiology of lateral epicondylitis, which has failed to resolve with traditional nonsurgical modalities. We feel with larger control trials and with a longer follow-up period, a fair conclusion can be drawn with regard to the efficacy and otherwise of this treatment modality.

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CLINICAL PHOTOGRAPHS



Fig. 1: METHOD TO DRAW AUTOLOGUS BLOOD

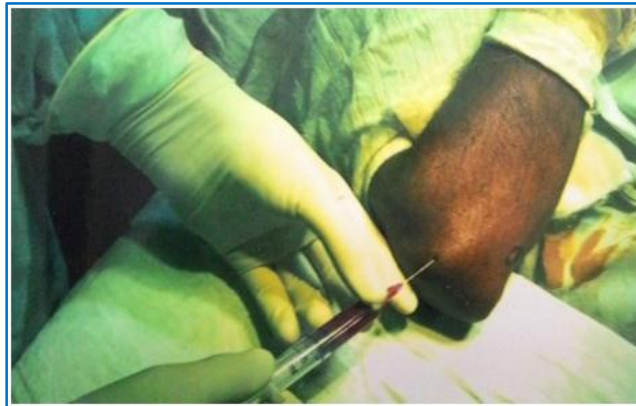


Fig. 2: METHOD OF INJECTING

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