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Research Article

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Local Autologous Blood Injection Versus Corticosteroid Injection in the Treatment of Lateral Epicondylitis- A Prospective Comparative Study

Ranjit Kumar Baruah[1], Hiren Pegu[2], Manoj Kumar Chamlagai[3], Sajid Hussain[3]*

[1]Retd. Prof. & HOD, Department of Orthopaedics, Assam Medical College, Dibrugarh, India
[2]Assistant Professor, Department of Physical Medicine and Rehabilitation, Lakhimpur Medical College, North Lakhimpur, India
[3]Post Graduate Trainee, Department of Orthopaedics, Assam Medical College, Dibrugarh, India

***Address for Correspondence:** Dr. Sajid Hussain, Post Graduate Trainee, Department of Orthopaedics, Assam Medical College, Dibrugarh, India
E-mail: mansajid06@gmail.com

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ABSTRACT

Background: Lateral epicondylitis, also known as tennis elbow, is characterized by pain and tenderness at the lateral epicondyle of the humerus that worsens with grip and dorsiflexion of the wrist against resistance.

Methods: This prospective study was carried out at our institution from July 2013 to June 2014, with approval from the ethical committee. Sixty patients with clinically diagnosed lateral epicondylitis were divided into two groups: Group A received local autologous blood, and Group B received local corticosteroid injections. Patients were evaluated using the Thomsen provocative test with Visual Analogue Scale, patient-rated tennis elbow evaluation score, and maximal grip strength at baseline (before injection) and 4 weeks, 12 weeks, and 24 weeks after injection. The statistical analysis used paired and unpaired t-tests, with significance set at $p<0.05$.

Results: Both treatment groups showed significant improvements in pain and function at 24 weeks compared to baseline. However, Group B (corticosteroid injection) demonstrated superior short-term outcomes at 4 weeks in pain reduction and grip strength. In contrast, Group A (autologous blood injection) exhibited better long-term outcomes at 24 weeks with statistically significant improvements in pain reduction (71.3% vs. 45.5%), patient-rated tennis elbow evaluation scores (50.67% vs. 37.72%), and grip strength (24.19% vs. 13.69%) compared to Group B.

Conclusion: Autologous blood injection therapy appears to be a promising treatment option for lateral epicondylitis, offering superior long-term outcomes compared to corticosteroid injection. While corticosteroid injection showed initial advantages in short-term pain relief and grip strength, autologous blood injection resulted in sustained improvements over the 24-week follow-up period. These findings support autologous blood injection as a preferred treatment option due to its effectiveness and lower recurrence rates, suggesting its consideration in clinical practice for managing lateral epicondylitis.

Key-words: Lateral Epicondylitis, Local Corticosteroid Injection, Local Autologous Blood Injection, Tennis Elbow, Visual Analogue Scale

INTRODUCTION

Lateral epicondylitis, also known as tennis elbow, is characterized by pain and tenderness at the lateral epicondyle of the humerus that worsens with grip and dorsiflexion of the wrist against resistance.

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It is a common disorder around the elbow joint and the second most common of all musculoskeletal disorders in the neck and upper extremity. [1]

The word epicondylitis was questioned over time because histological tests revealed no inflammatory cells (macrophages, lymphocytes, or neutrophils) in the affected tissues. The majority of current research has proposed that lateral epicondylitis is caused by degeneration of the origin of the extensor carpi radialis brevis, repetitive microtrauma, and an insufficient healing response (tendinosis). [2-7]

Angiofibroblastic hyperplasia is the name given to the

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constellation of findings. [8] Most conservative treatments, such as local corticosteroid injections, have aimed to inhibit an inflammatory process that does not exist. It is hypothesized that the therapeutic benefits of the steroid injection come from the bleeding generated by driving fluid through tissue planes at high pressures. [9] Infiltration of local autologous blood may provide necessary chemical modifiers of cellular activity known to be mitomorphogenic which are helpful in healing. [8,10,11] We did this study to compare the role of autologous blood injection in the treatment of lateral epicondylitis to the routinely utilized local corticosteroid injection.

MATERIALS AND METHODS

Place of study- This study was conducted at our institution, Assam Medical College and Hospital from July 2013 to June 2014, following ethical committee approval.

Inclusion criteria- Patients over the age of 18 years with clinical symptoms of lateral epicondylitis, a positive Cozen's test, and a positive Mill's manoeuvre were included in the study after obtaining proper informed consent.

Exclusion criteria- Patients who had any type of local infiltration within the previous three months or who had previously undergone surgery for tennis elbow were excluded from the study. Patients who were pregnant, had previous trauma, had uncontrolled diabetes mellitus, and had pain around the elbow for reasons other than tennis elbow, such as osteochondritis-dissecans of the capitellum, epiphyseal injury, varus instability, radial head arthritis, posterior interosseous nerve syndrome, cervical disc lesions, radio-humeral joint synovitis, fibromyalgia, and did not provide informed consent were also excluded from the study. Doubtful cases were investigated further by X-ray, Ultrasonography or MRI to make a diagnosis.

Study Procedure- In a group of patients clinically diagnosed with lateral epicondylitis. The first pair of patients was selected by lottery. The patients were allotted sequentially into two parallel groups, Group-A received a local autologous blood injection while Group-B received a local corticosteroid injection. Results were recorded using Thomsen Provocative Test with Visual Analogue Scale, [12] maximal grip strength was measured using sphygmomanometer as described by the American Society of Hand therapist, [13] and modified patient rated tennis elbow evaluation (PRTEE). [14] The scores were entered in a specified proforma on the day of injection before administering the injection, as well as after 4 weeks, 12 weeks, and 24 weeks intervals. Group A received 1 ml of Autologous Blood Injection drawn from the contralateral upper limb vein, combined with 1 ml of 2% lignocaine. With the patient supine or seated, the elbow is flexed to 90° with the palm facing down, and the anatomical bone landmarks are identified. Under aseptic conditions, the 24 G needle was inserted proximal to the lateral epicondyle along the supracondylar ridge and gently advanced into the undersurface of the extensor carpi radialis brevis while infiltrating. [2] After that, a small adhesive sterile dressing was applied. Patients were advised to rest the upper limb for three days, with no restriction of activity after that. Group B received an injection of Corticosteroid (triamcinolone 40 mg) mixed with 1 ml 2% lignocaine, at the lateral epicondyle according to the same technique as mentioned above.

Statistical Analysis- The findings were analysed using a paired 't' test to compare parameters within the group and an unpaired 't' test to compare parameters between groups. $p<0.05$ were considered statistically significant.

Ethical Approval- The Human Ethical Committee at Assam Medical College and Hospital, Dibrugarh, India approved the above study.

RESULTS

Sixty patients including 30 males and 30 females above 18 years of age with sixty elbows were included in the study. The study had 30 elbows in each group (Group A= 30 & Group B=30). Group A received local autologous blood injection while Group B received local corticosteroid injection. Before local administration of autologous blood or corticosteroid, i.e. 0-week recording of Thomsen provocative test with VAS, patient-rated tennis elbow evaluation score and maximum grip strength were taken and the mean of both the groups were recorded.

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At 4 weeks the Thomsen provocative test with VAS mean score improved in the Autologous blood injection group and local corticosteroid injection group by 34.26% and 79.28% respectively ($p<0.05$) at 12 weeks the improvements were 68.98% and 63.06% respectively ($p>0.05$) and at 24 weeks the improvements were 71.3% and 45.5% respectively ($p<0.05$). At 24 weeks the improvement with local autologous blood injection was better and was statistically significant when compared to the group receiving local corticosteroid injection (Table 1 & Fig. 1).

Table 1: Table comparing results of Thomsen provocative test with VAS scores between the two groups.

		VAS (Mean ± S.D.)	Improvement (Mean ± S.D.)	Improvement (%)	p-Value
0 Weeks (Before local administration)	Group A	7.20 ±1.63		-	-
	Group B	7.40±1.69		-	-
4 Weeks	Group A	4.73±1.62	2.47±1.38	34.26	<0.05
	Group B	1.53±1.43	5.87±1.33	79.28	-
12 Weeks	Group A	2.23±2.19	4.97±2.47	68.98	>0.05
	Group B	2.73±1.87	4.67±2.54	63.06	-
24 Weeks	Group A	2.07±2.07	5.13±2.69	71.3	<0.05
	Group B	4.03±1.38	3.37±1.99	45.5	

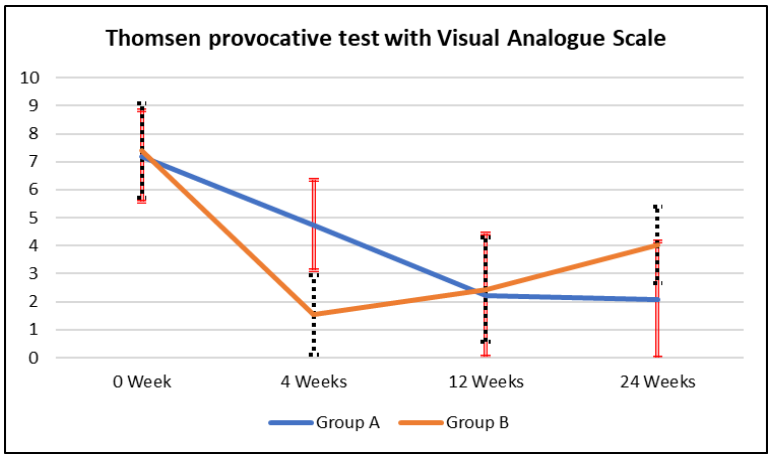

Fig. 1: Line diagram comparing results of Thomsen provocative test with VAS between two groups

At 4 weeks, the mean patient-rated tennis elbow evaluation score improved in the group receiving local autologous blood injection and local corticosteroid injection by 25.62% and 50.48% respectively ($p<0.05$), at 12 weeks the improvements were 52.96% and 50.35% respectively ($p>0.05$) and at 24 weeks the improvements were 50.67% and 37.72% respectively. The improvement at 24 weeks was better in the group receiving local autologous blood injections ($p<0.05$) (Table 2 & Fig. 2).

Table 2: Table comparing patient-rated tennis elbow evaluation scores between the two groups.

		Patient-rated tennis elbow evaluation score	Improvement (Mean±S.D.)	Improvement (%)	p-value
0 Weeks (Before local administration)	Group A	52.30±6.70	-	-	-

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	Group B	51.70±5.23	-	-	-
4 Weeks	Group A	38.90±7.97	13.40±5.67	25.62	<0.05
	Group B	25.60±6.11	26.10±6.73	50.48	-
12 Weeks	Group A	24.60±5.59	27.70±2.96	52.96	>0.05
	Group B	25.67±6.11	26.03±5.83	50.35	-
24 Weeks	Group A	25.80±6.04	26.50±3.25	50.67	<0.05
	Group B	32.20±5.70	19.50±5.43	37.72	

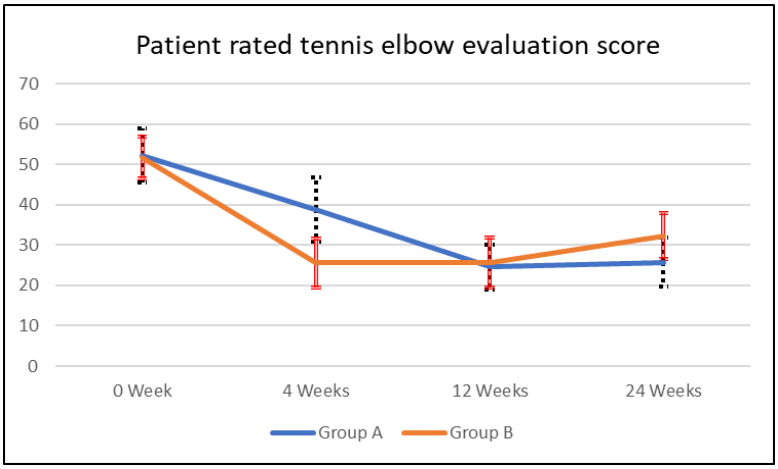

Fig. 2: Line diagram comparing patient rated tennis elbow evaluation score between two groups

The improvements in mean grip strength at 4 weeks in the group receiving local autologous blood injection and local corticosteroid injection were 8.1% and 33.24%, respectively ($p<0.05$). At 12 weeks, the improvements were 21.6% and 28.52%, respectively ($p>0.05$) and at 24 weeks, the improvements were 24.19% and 13.69%, respectively ($p<0.05$). At short-term follow-up, the local corticosteroid injection group had a better and statistically significant advantage over local autologous blood injection group whereas at longer-term follow up the local autologous blood injection group, have a statistically significant advantage over the local corticosteroid injection group (Table 3 & Fig. 3).

No complications were observed in either of the two groups.

Table 3: Table comparing maximum grip strength between the two groups.

		Maximum grip strength	**Improvement (Mean ± S.D.)**	**Improvement (%)**	**p-Value**
0 Weeks (Before local administration)	Group A	106.93±18.99		-	-
	Group B	98.87±11.52		-	-
4 Weeks	Group A	115.60±17.74	8.67±4.71	8.1	<0.05
	Group B	131.73±9.93	32.87±3.47	33.24	-
12 Weeks	Group A	130.03±18.71	23.10±0.99	21.6	>0.05
	Group B	127.07±11.65	28.20±6.27	28.52	-
24 Weeks	Group A	132.80±21.38	25.87±15.09	24.19	<0.05
	Group B	112.40±10.55	13.53±3.35	13.69	-

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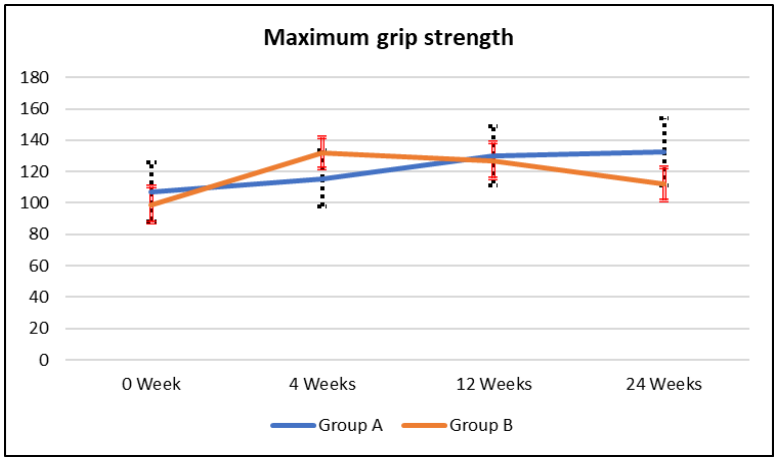

Fig. 3: Line diagram comparing maximum grip strength between two groups

DISCUSSION

Lateral epicondylitis is the most common cause of lateral elbow pain in our clinical practice. Most of them are self-limiting. There are many surgical and non-surgical modalities available if it becomes chronic and continues to cause pain [15].

In a study of sixty patients, Kazemi et al found that corticosteroid injections had a high short-term success rate. However, autologous blood injection and extracorporeal shock wave therapy produced better long-term outcomes, particularly given the high recurrence rate with corticosteroid injection. Compared to extracorporeal shock wave therapy, autologous blood injection is less expensive and requires no additional equipment, while producing long-term benefits comparable to extracorporeal shock wave therapy [16]. In our study, the group which got local corticosteroid injection had better outcomes in short-term follow up while on longer follow up the local autologous blood injection group had better outcomes.

In their prospective randomized study of 60 patients, Dojode *et al.* [16] divided them into two groups, with 30 patients each receiving local autologous blood injection and 30 patients receiving local corticosteroid injection, respectively. The outcome was determined by a pain score and Nirschl staging of lateral epicondylitis.

The follow-up period lasted six months, with assessments taking place every one week, four weeks, twelve weeks, and six months. At one week and four weeks, the corticosteroid injection group experienced significantly less pain than the autologous blood injection group on both the visual analogue scale (VAS) and the Nirschl stage.

At the 12-week and 24-week follow-ups, the autologous blood injection group experienced a statistically significant decrease in pain compared to the corticosteroid injection group.

At the six-month final follow-up, 14 patients (47%) in the corticosteroid injection group and 27 patients (90%) in the autologous blood injection group reported complete pain relief. Autologous blood injection is more efficient than corticosteroid injection, with fewer side effects and a lower recurrence rate. [17] In our study, the group that received local autologous blood injections had better long-term follow-up results in terms of the Thomsen provocation test with VAS, patient-rated tennis elbow evaluation score, and maximal grip strength.

There was no incidence of complications in our study subjects administered with either of the two local injections. The drawback of our study was having a smaller sample size and a relatively shorter follow up period.

CONCLUSIONS

From this study, it was also concluded that autologous blood injection therapy appears to be a promising treatment option for lateral epicondylitis, offering superior long-term outcomes compared to corticosteroid injection. While corticosteroid injection showed initial advantages in short-term pain relief and grip strength, autologous blood injection resulted in sustained improvements over the 24-week follow-up period.

These findings support autologous blood injection as a preferred treatment option due to its effectiveness and lower recurrence rates, suggesting its consideration in clinical practice for managing LE. To further validate these findings, larger sample sizes and longer follow-up periods are necessary for future studies.

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CONTRIBUTION OF AUTHORS

Research concept- Ranjit Kumar Baruah, Hiren Pegu

Research design- Hiren Pegu, Manoj Kumar Chamlagai, Sajid Hussain

Supervision- Ranjit Kumar Baruah

Materials- Hiren Pegu, Manoj Kumar Chamlagai, Sajid Hussain

Data collection- Manoj Kumar Chamlagai, Sajid Hussain

Data analysis and interpretation- Manoj Kumar Chamlagai, Sajid Hussain

Literature search- Manoj Kumar Chamlagai, Sajid Hussain

Writing article- Manoj Kumar Chamlagai, Sajid Hussain

Critical review- Ranjit Kumar Baruah

Article editing- Ranjit Kumar Baruah, Hiren Pegu

Final approval- Ranjit Kumar Baruah

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