

Comparative Efficacy of Corticosteroids Versus Prolotherapy in The Treatment of Patients with Chronic Lateral Epicondylitis

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ABSTRACT:

Introduction: Lateral epicondylitis or tennis elbow is the most common lesion of the elbow with prevalence of about 1-3% in the aged 35-55 years among normal population. ⁽¹⁾ Lateral epicondylitis also affect the daily routine activities and can impact financial burden of the affected individuals. The individuals were diagnosed clinically on symptoms, pain tenderness and pain score elicited by Mill's test, Cozen test and Maudsley test. **Methods:** Fifty subjects with chronic lateral epicondylitis attending PMR OPD GIRM, KK Nagar, Madras medical college, Chennai, were randomly assigned two groups after getting the informed consent. The study was conducted during the period from 2019 to 2020. All the patients were assessed by using VAS, PRTEE and NPRS pain scales and grip strength Dynamometer and followed up once before injection and 1,3 and 6 months after injection. **Conclusion:** Both steroid therapy and Prolotherapy with 25 % dextrose were effective. Steroid therapy shows improvement for shorter period but Prolotherapy shows improvement even after 6 months of follow up in treating tennis elbow or chronic lateral epicondylitis.

Keywords: Prolotherapy, tennis elbow, lateral epicondylitis

INTRODUCTION:

Lateral epicondylitis is the most common lesion of the elbow. Lateral epicondylitis (LE) is a painful enthesopathy or tendinosis of the common extensor tendon at the outer region of the elbow at the fibro-osseous junction. It was first described in 1873 by Runge.

Evidence suggests that the predominant factor involved is a degenerative rather than an inflammatory process. The tendinous origin of extensor carpi radialis Brevis, is the area of most pathologic changes occurs. Changes also found in extensor carpi radialis longus, extensor carpi ulnaris and extensor digitorum communis.

Lateral Epicondylitis condition is more common in patients aged between 35 and 55 years. It has been estimated that 1-3% of the population suffer from this condition with equal distribution between men and women and it is more commonly in the dominant arm. Histological specimens from patients with chronic LE suggest that tendinosis is not an acute inflammatory condition but rather a failure of the normal tendon repair process associated with angiofibroblastic degeneration.

(2)

Recent histopathological examinations suggest that a non-inflammatory process is present and hence treatments should be aimed at normal vascularisation and collagen production in the affected tendon.

Tennis elbow can produce a long lasting economic crisis for a patient due to inability to work and hence treatment with symptomatic relief in the shortest possible time is the need. History and physical examination including manual provocation tests are key elements for the diagnosis of LE.

Cozen's test and Maudsley test are better tests for ruling out lateral epicondylitis whereas Mill's test is an excellent diagnostic test for ruling in lateral epicondylitis. Although diagnostic methods including magnetic resonance imaging, ultrasound (US), x-ray, can diagnosis the underlying abnormalities especially in chronic cases resistant to medical treatment.

Traditional treatments include rest, activity modification, cold compression, nonsteroidal anti-inflammatory drugs, and physical therapy like ultrasonic massage. However, none of these treatments has proved to be generally effective.

The most common treatment of LE is the corticosteroid injection, which is used to reduce inflammation in

subjects with a variety of chronic tendinopathies. However, because histologic studies have not found inflammation as a major feature in this condition, the rationale for corticosteroid injection appears misguided. There is some evidence to suggest that inflammation may actually be a useful component of the response to injury and healing process. Therefore, inhibiting this process may actually be counterproductive.⁽³⁾

Prolotherapy has been defined as the iatrogenic stimulation of wound healing and tissue repair through the injection of an irritant solution into damaged ligaments and tendons.

Prolotherapy solutions are purported to initiate an inflammatory cascade at the site of injection, which induces fibroblast proliferation and subsequent collagen synthesis, resulting in a tighter and stronger ligament or tendon.⁽⁴⁾ Thus, corticosteroid injections for chronic LE treatment are used to suppress inflammation, the primary mechanism of action of prolotherapy is to induce a small inflammatory response to promote adequate healing or more viable scar tissue formation that results in stronger fibrous tissue at the lateral epicondyle, which leads to improved function and reduced pain. Stimulation of the production of these key growth factors for ligaments, tendons, and cartilage through dextrose prolotherapy could be an inexpensive method of growth stimulation that may prove to be cost effective for the long term. When injected into tissue, exogenous dextrose has been found in animal and human studies to stimulate inflammatory response, ligament size, tendon hypertrophy, extracellular matrix, fibroblastic proliferation, and repair of articular cartilage defects.

AIM & OBJECTIVES:

To compare the efficacy in the pain relief and functional outcome of ultrasound guided CORTICOSTEROID versus PROLOTHERAPY with 25%DEXTROSE in the treatment of Patients with chronic lateral epicondylitis.

SCREENING PROCEDURES / VISITS:

Detailed history taking, review of case file including investigations such as FBS, PPBS, X-RAY elbow and also to know the underlying co morbid medical conditions such as IHD, CAD, DM, etc.,

INCLUSION CRITERIA:

- 1.Age; 30 to 60 yrs.
- 2.Pain on the lateral side of the elbow at rest or while performing ADL.
- 3.Tenderness over the lateral epicondyle compared with that of the normal elbow.

4.Pain with resisted wrist extension or Pain with passive wrist flexion with the elbow extension.

5.Willingness to comply with treatment and follow-up assessments.

6.History of pain more than 3 months less than 2 yrs.

EXCLUSION CRITERIA:

- History of inflammatory arthropathy
- Recent history of injury, trauma and fracture
- Radial nerve compression
- Coagulopathy
- History steroid injection with in 6 months before intervention
- Pregnancy/lactation
- Bleeding diathesis, thrombocytopenia
- Intolerance/allergy to local anesthetics or injection corticosteroid.
- Uncontrolled type2 DM

METHODOLOGY:

All patients attending PMR OPD with lateral epicondylitis, fulfilling the inclusion and exclusion criteria and completion of 3 weeks conservative treatment, if pain not settled randomly assigned either A or B group.

Institutional Ethical Committee approval was obtained before starting the study. Informed written consent was obtained from each participant.

- GROUP A- 50 SAMPLE AND GROUP B- 50 SAMPLE
- After getting informed consent from Group A and Group B
- The two groups were treated as below.
- Tested with 2%lignocaine test dose under strict aseptic precautions
- **Group A:** treated with 1ml 2%lignocaine and USG guided - 1ml of methyl prednisolone infiltration
- **Group B:** will be treated with 1ml 2%lignocaine and USG guided - 1ml of 25%dextrose
- Both Groups (A & B) will undergo the Scheduled Exercise Therapy.

The participant, physiotherapist, theater staff were blinded to know about the treatment received.

Surface anatomy of injection sites. (A) Common extensor tendon. (B) Radial collateral ligament. (C) Annular ligament, radial portion



Statistical Analysis:

Table 1: Distribution of diagnostic test among the groups

Test	Result	Steroid group	Prolotherapy group
Mill's Test	Positive	46(92%)	45(90%)
	Negative	4(8%)	5(10%)
Cozen test	Positive	50(100%)	48(96%)
	Negative	0 2(4%)	2(4%)
Maudsley test	Positive	45(90%)	42(84%)
	Negative	5(10%)	8(16%)

The above table shows the distribution of diagnostic test among the population.

Table 2.: Comparison of VAS score between the groups among different time periods

Time period	Group	VAS Score	Table value	P value
Basal mean (SD)	Steroid	7.30(0.67)	3.07	0.69a
	Prolotherapy	7.36(0.85)		
I month Median (interquartile range)	Steroid	1.00(1.00,2.00)	191.50	<0.001b
	Prolotherapy	5.00(4.00,6.00)		
3 month Median (interquartile range)	Steroid	4.00(2.00, 5.00)	805.50	0.002b
	Prolotherapy	5.00(3.75, 5.25)		
6 month Median (interquartile range)	Steroid	4.00(3.00, 5.00)	1025.00	0.014b
	Prolotherapy	3.00(2.00, 3.00)		

a- Independent t test b- Mann Whitne U test p value ≤ 0.05 is significant

The table shows that the steroid group had less pain score at 1 month and 3 month, but prolotherapy group showed less pain score at 6 months. The differences were statistically significant.

Table 3.: Comparison of PRTEE score between the groups among different time periods

Time period	Group	PRTEE score	Table value	P value
Basal mean (SD)	Steroid	73.30(9.18)	0.004	0.82a
	Prolotherapy	72.84(10.39)		
I month Median (interquartile range)	Steroid	14(10,20)	140.500	<0.001b
	Prolotherapy	54(35.75,64.50)		
3 month Median (interquartile range)	Steroid	37.50(28.00, 44.00)	636.500	<0.001b
	Prolotherapy	50(40,60)		
6 month Median (interquartile range)	Steroid	39.50(32.00, 43.75)	1072.00	0.02b
	Prolotherapy	35.50(30, 37)		

a- Independent t test b- Mann Whitne U test p value ≤ 0.05 is significant

The table shows that the steroid group had less PRTEE score at 1 month and 3 month, but prolotherapy group showed less PRTEE score at 6 months. The differences were statistically significant.

Table 4.: Comparison of NPRS score between the groups among different time periods

Time period	Group	NPRS score	Table value	P value
Basal mean (SD)	Steroid	6.94(0.89)	1.22	0.32a
	Prolotherapy	7.12(0.92)		
I month Median (interquartile range)	Steroid	2(1,4)	424.00	<0.001b
	Prolotherapy	424.00		
3 month Median (interquartile range)	Steroid	3(2,4)	620	<0.001b
	Prolotherapy	5(4,6)		
6 month Median (interquartile range)	Steroid	4(2.75,6.00)	1228.50	0.08b
	Prolotherapy	3(2,4)		

a- Independent t test b- Mann Whitne U test p value ≤ 0.05 is significant

The table shows that the steroid group had less NPRS score at 1 month and 3 month, but prolotherapy group showed less NPRS score at 6 months. The differences were statistically significant.

DISCUSSION:

The study was done with an objective of comparing the efficacy in the pain relief and functional outcome of ultrasound guided corticosteroid versus prolotherapy with 25% dextrose in the treatment of Patients with chronic LE.

In study persons 92 % in steroid and 90% in prolotherapy group had mill's test positive. 100 % of steroid group and 96% of prolotherapy group had Cozen's test positive. 90% of steroid group and 84% of prolotherapy group had Maudsley test positive.

The result of VAS, PRTEE and NRS score showed that steroid injection was better in the short term period, but prolotherapy became more significant and effective for the long term.

Yelland et al, did a study to assess the effectiveness of prolotherapy and physiotherapy singly or in a combination. This study showed the mean value of prolotherapy at 26 weeks to be 89(8.2). The result showed that there is no difference in the outcome measures for the single or combination group. ⁽⁵⁾

Rabago et al did a study to assess the efficacy of prolotherapy using 2 solutions Hypertonic dextrose and morrhuate sodium injections among patients of LE. Both the injection group received a better outcome measure compared to the control group even after three months. At 16 wks, compared with baseline, the prolotherapy with dextrose and prolotherapy with dextrose-morrhuate groups demonstrated enhanced composite PRTEE scores by 41.1% and 53% respectively. The grip strength of dextrose group was more compared to that of sodium morrhuate. ⁽⁶⁾

Rabago et al did a systematic review of four injection therapies for lateral epicondylitis, prolotherapy, polidocanol, whole blood and platelet-rich plasma showed these injections showed a long standing sustained improvement in terms of outcome measures. The study proposed that each of the four therapies is efficient for LE. ⁽⁷⁾

Scarpone et al did a study to assess the effectiveness of prolotherapy over the control group and is assessed for improvement in elbow pain, grip strength, and

extension strength among patients with LE. Prolotherapy subjects showed an improvement in extension strength and grip strength in comparison to control group and baseline. Clinical improvement in Prolotherapy group subjects was preserved at 52 weeks.⁽⁸⁾

Carayannopoulos et al did a study to assess the efficacy of prolotherapy versus corticosteroid injection for the treatment of chronic LE. The pain score and disability score for both the groups showed a significant improvement. The prolotherapy group showed a better outcome at 3 months and 6 months whereas the steroid group showed a significant difference at 3 months.⁽⁹⁾

LIMITATION:

- Occupational based characters were not assessed among the subjects.
- The study could have assessed more characteristics related to improvement of LE like grip strength, extension power and velocity.

CONCLUSION:

The steroid group had less VAS/ PRTEE / NPRS pain score at 1 month and 3 month, but prolotherapy group showed less pain score at 6 months. The differences were statistically significant.

Both steroid therapy and Prolotherapy with 25 % dextrose were effective. Steroid therapy shows improvement for shorter period but Prolotherapy shows improvement even after 6 months of follow up in treating tennis elbow or chronic lateral epicondylitis.

Disclosure:

This study has no funding source and authors has no conflict of interest in this study.

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