



ROLE OF LOCAL CORTICOSTEROID INJECTION IN THE MANAGEMENT OF TENNIS ELBOW

Orthopaedics

Dr. Bashir
Mohammed
Chowdhary

Consultant Orthopaedics, SDH, Bijbahara

Dr. Mudasir
Ahmad Bhat*

MS Orthopaedics *Corresponding Author

ABSTRACT

Background: Tennis elbow is the most common chronic musculoskeletal pain condition affecting the elbow, causing significant pain, disability and lost productivity. Some first line treatments available are anti-inflammatory drugs, brace, physiotherapy and curtailing repetitive activities. If the first line treatment fails, second line treatment generally is offered, as saline, corticosteroid or platelet-rich plasma injections. The aim of this study was to know the efficacy of local corticosteroids in its management. **Methods:** This study was conducted to evaluate role of corticosteroid injection in 60 patients with tennis elbow. Patients were evaluated at the end of 2nd, 6th and 12th week post-intervention. Assessment of pain intensity was done before intervention and at the follow-up of 6 and 12 weeks after intervention using visual analog scale (VAS). **Results:** In this study mean VAS score before injection was 7.13 ± 1.82 (range 5-10), which shows significant reduction at the follow-up of 6 and 12 weeks. At the follow-up of 6 and 12 weeks mean VAS score was 0.88 ± 0.24 (range 0-6) and 1.08 ± 0.12 (0-8) respectively. **Conclusion:** Corticosteroid injection is the corner store of care for tennis elbow, which relieves pain and reduce inflammation, allowing sufficient rehabilitation and return to activities.

KEYWORDS

Tennis elbow, corticosteroid injection, pain

BACKGROUND

Tennis elbow, also known as lateral epicondylitis (LE) is the most common chronic musculoskeletal pain condition affecting the elbow, causing significant pain, disability and lost productivity. The reported point prevalence of tennis elbow is between 1 and 3 % within the general population [1]. Up to 50% of all tennis players also experience some type of elbow pain, with 75 to 80% of these elbow complaints attributable to tennis elbow [2, 3]. Approximately 40 % of people will experience tennis elbow at some point in their life [4]. It most commonly presents in men and women aged between 35 and 54 years [5]. Tennis elbow most commonly affects the dominant arm, particularly when performing repetitive activity. Up to 17% of workers within industries that involve highly repetitive hand tasks, such as meat processing and factory workers, experience tennis elbow [6].

Tennis elbow was first described by Runge in 1873. [1] Although originally described as an inflammatory process, the current consensus is that lateral epicondylitis is initiated as a micro-tear, most often within the origin of extensor carpi radialis brevis. Tennis elbow is a diagnosis based on clinical history and physical examination, with diagnostic imaging best used when a differential diagnosis is likely. Tennis elbow is typically diagnosed by the presence of pain over the lateral humeral epicondyle that may radiated is tally in to the forearm. This pain is aggravated by palpation, gripping and resisted wrist and/or second or third finger extension [7].

The first-line treatment for Tennis elbow is conservative, consisting of topical and oral anti-inflammatory drugs, ice application, and brace use. This treatment might fail to resolve the complaints of some patients, and second-line therapy modalities, which are generally invasive, are offered. Second-line treatments include saline, corticosteroid, or platelet-rich plasma injections [8, 9]. The aim of this study was to evaluate the role of corticosteroid injection in the management of tennis elbow.

METHODS

This prospective randomized control trial was conducted in the department of Orthopaedics, SDH Bijbahara from June 2020 to May 2022. In this study a total of 60 patients with tennis elbow, managed with local corticosteroid injection were enrolled. Diagnosis was made on the basis of clinical examination with complaint of pain in elbow leading to impairment of daily activities. Patients included in this study are having Pain and tenderness over lateral epicondyle of humerus of 6-12 weeks, utilizing provocative tests and point tenderness at the insertion of the ECRB at the lateral epicondyle. The inclusion criteria were, patients who had pain at lateral epicondyle for more than 3 months, patients not getting any benefit from 1 line treatment of lateral epicondylitis and patients who had pain during forced forearm

supination, forced wrist extension, and forced third finger extension for more than 3 months. The patients who had other co-morbidities than the pain at lateral epicondyle, patients who have high RBS and patients having osteochondritis, dissecans, or osteonecrosis were excluded from the study.

All patients were counseled about the advantages and disadvantages of treatment, natural history of disease and a written informed consent was obtained.

Injection Technique

Patient was positioned supine, arm adducted by side, elbow kept in 45 degrees of flexion and forearm & wrist pronated. Under all sterile precautions participants received a single dose (2 mL) of triamcinolone acetate (40 mg/mL) injection at the site of maximum tenderness. Insertion site was compressed firmly to avoid any bleeding.

Follow-up

Patients were evaluated at the end of 2nd, 6th and 12th week post-intervention. Patients were not allowed to take any other medication during the trial. The patients were told not to use any other treatment, including ice application, topical non-steroidal anti-inflammatory drugs, or other oral medications, during the trial so as not to affect the outcomes during follow up. Assessment of pain intensity was done before intervention and at the follow-up of 6 and 12 weeks after intervention using visual analog scale (VAS).

RESULTS

The mean age of the patients was 41.7 years in group A and 43.8 (range 33-51) years. There were 23 (38 %) males and 37 (62 %) females in this study. Right side of limb was affected in 41 (68 %) patients and left side was affected in 19 (32 %) patients

In this study, 19 (32 %) patients had moderate pain and 41 (68 %) had severe pain before intervention. At the follow-up of 6 and 12 weeks significant difference was found in pain intensity among enrolled population. On physical examination 48 (80 %) and 52 (87 %) patients had no pain at 6 and 12 weeks follow-up respectively. 3 (5 %) patients had moderate pain (VAS 4-7) at 6 and 12 weeks follow-up. At the follow-up of 12 weeks, 5 (8 %) patients showed severe pain intensity (VAS 8-10) (Table 1).

Table 1: Results According To Visual Analog Scale (vas) At Different Time Intervals

Variables	Before injection		At 6-weeks		At 12-weeks	
	Frequency	Percent-tage	Frequency	Percent-tage	Frequency	Percent-tage

0	No. severity	0	0	48	80	52	87
1-3	Mild	0	0	9	15	0	0
4-7	Moderate	19	32	3	5	3	5
8-10	Severe	41	68	0	0	5	8

In this study mean VAS score before injection was 7.13 ± 1.82 (range 5-10), which shows significant reduction at the follow-up of 6 and 12 weeks. At the follow-up of 6 and 12 weeks mean VAS score was 0.88 ± 0.24 (range 0-6) and 1.08 ± 0.12 (0-8) respectively (Table 2).

Table 2: Mean VAS Score At Different Time Intervals

Time intervals	Mean	SD	Range
Baseline	7.13	1.82	5 -10
At 6-weeks	0.88	0.24	0-6
At 12-weeks	1.08	0.12	0-8

DISCUSSION

Tennis elbow is a condition, characterized by pain and tenderness over the lateral epicondyle of the humerus, and pain on resisted dorsiflexion of the wrist, middle finger, or both [10]. Tennis elbow, which is also known as lateral epicondylitis, periostitis, extensor carpi radialis brevis-tendinosis, and epicondylalgia, is obscure and controversial. Because inflammatory cells are absent in LE, the term periostitis has fallen into disuse [11]. The term "Tennis elbow" is a quite common condition affecting the general population who may have never played tennis, though it is more common in tennis elbow. It increases the morbidity as it affects the daily routine activities. It occurs mostly due to stress, overload, overuse and repeated pronation and supination movements. Tennis elbow is common, especially in middle age [12]. Studies report no gender difference, whereas tobacco consumption and forceful supination activities are risk factors [12]. Various clinical studies have reported the incidence of tennis elbow to be 1–3%. It is the disease of 4th decade [13]. Both genders are equally affected. Some studies show those males are more affected. In our study the patients affected were in the early forties, both genders were affected. The dominant side was affected in most of the patients. This finding is consistent with other studies [14].

It is usually a self-limiting condition, it is seen that approximately 80% of the patients improve in their symptoms over 1 year of time with conservative management. Poor prognostic factors includes manual labour, dominant arm being involved and prolonged duration of symptoms.

Another controversial issue in tennis elbow is its pathophysiology. Although some publications advocate that the cause of tennis elbow is overuse trauma [8], recent publications do not confirm this understanding. Some publications propose increased activity of extensor carpi radialis brevis and increased level of excitatory neurotransmitters as cause of the disease. Refractory cases may be due to entrapment of posterior interossei nerve in radial tunnel. New studies show that the main pathophysiological hallmark of tendinopathy is neovascularity and disorganized collagen fibers. However, the cause of the degenerative changes and pain is unclear. Mechanical, neural, and vascular problems and healing failure are blamed for the pathophysiology of tennis elbow [15].

Diagnosis is made by sign and symptoms like pain and tenderness over lateral epicondyle of elbow, pain is aggravated by restricted dorsiflexion of wrist and repeated supination and pronation of forearm, pain on grasping objects forcefully. Radiographs are usually within normal limits, calcific tendinitis may be seen in certain cases. MRI may be aid in diagnosis, thickened tendon; ECRB origin thinned, separated partially or completely torn can be visualized on T1 and T2 images.

Finally, the treatment in tennis elbow is also controversial. The main treatment of is non-surgical and involves anti-inflammatory drugs, brace use, and extra corporeal shock wave therapy [8, 11]. However, these methods have not been shown to be more effective in the long-term than watchful waiting [15]. When conservative methods are not effective, invasive techniques, such as dry needling, corticosteroid and/ or local anaesthetic, platelet rich plasma injections and surgical intervention, are an option [16]. However, the best treatment must be effective, practical, and inexpensive to enable better recovery and a rapid return to work.

This study was carried out to evaluate the role of local corticosteroid injection in management of tennis elbow, which has the advantage that

it gives functional improvement following the first injection. Corticosteroid injection has been historically the most common intervention for lateral epicondylitis. Many methods have been used for treatment of this condition. Smidt et al. [17] reviewed 13 randomized, controlled trials that evaluated the effects of corticosteroid injections compared to placebo injection, injection with local anesthetic and injection with dexamethasone and triamcinolone. Although the evaluated evidence showed superior short-term effects of corticosteroid injections for lateral epicondylitis in terms of pain relief and grip strength, no beneficial effects were found for intermediate- or long-term follow-up [17]. Altay et al. [18] compared 60 patients treated with 2 ml lidocaine to 60 patients treated with 1 ml lidocaine combined with 1 ml triamcinolone, with all injections performed with a peppering technique of 40–50 injections. Another trial compared disabilities of the arm, shoulder, and hand score, grip, and pain in 31 patients injected with lidocaine and dexamethasone and 33 patients injected with lidocaine only [19]. A third trial randomized 19 subjects to receive rehabilitation and a sham injection, and 20 to receive rehabilitation and a corticosteroid injection [20]. There was no significant difference between the two groups on a pain questionnaire, a visual analog pain scale, and a grip measurement at 4, 8, and 24 weeks ($P > 0.05$). Both groups improved significantly over time, with more than 80% of subjects reporting improvements from baseline to 6 months ($P > 0.5$) [20].

In this study a significant reduction of 6.25 and 6.05 (Mean VAS) was observed among patients using visual analog scale at 6 and 132-weeks follow-up respectively. The outcomes in the extended follow-ups indicated that its effects are diminishing. This is consistent with the findings of earlier research that assessed the efficacy of corticosteroid treatment [21]. While tennis elbow is often a self-limiting illness in several circumstances, it can become resistant in others if the patient continues to engage in the offending physical activity. As discussed all known modalities of treatment considered for tennis elbow have their pitfalls and no single modality is superior. Corticosteroid has gained importance because it is safe and economical. Overall, financial concerns should always be borne in mind while considering treatment options with comparable efficacy. Further studies are needed to ascertain how this therapy would work in the long term because the trial was only conducted for a short time with a limited follow-up period.

CONCLUSION

Corticosteroid injection is the corner stone of care for tennis elbow, which relieves pain and reduce inflammation, allowing sufficient rehabilitation and return to activities. Although this treatment has been described as highly successful, there remains a lack of information concerning the long-term outcome of steroid treatment. In conclusion, I believe that a corticosteroid injection runs the risk of delaying resolution of symptoms in the long run.

REFERENCES

- Shiri R, Viikari-Juntura E, Varonen H, Heliövaara M. Prevalence and determinants of lateral and medial epicondylitis: a population study. *Am J Epidemiol*. 2006;164:1065–1074.
- Kelley J, Lombardo S, Pink M, Perry J, Giangarra C. Electromyographic and cinematographic analysis of elbow function in tennis players with lateral epicondylitis. *Am J Sports Med*. 1994;22:359–363.
- Nirschl R. Tennis. *Elbow. Orthop Clin North Am*. 1973;4:787–800.
- Gruchow HW, Pelletier D. An epidemiologic study of tennis elbow. Incidence, recurrence, and effectiveness of prevention strategies. *Am J Sports Med*. 1979;7:234–238.
- Haker E. Lateral epicondylalgia: Diagnosis, treatment and evaluation. *Crit Rev Phys Rehabil Med*. 1993;5:129–154.
- Chiang HC, Ko YC, Chen SS, Yu HS, Wu TN, Chang PY. Prevalence of shoulder and upper limb disorders among workers in the fish-processing industry. *Scand J Work Environ Health*. 1993;19:126–131.
- Palmer K, Coggon D, Cooper C, Doherty M. Work related upper limb disorders: getting down to specifics. *Ann Rheum Dis*. 1998;57:445–446.
- Ozkut AT, Kilinçoğlu V, Ozkan NK, Eren A, Ertaş M (2007) Extracorporeal shock wave therapy in patients with lateral epicondylitis. *Acta Orthop Traumatol Turc* 41:207–210.
- Tsikopoulos K, Tsikopoulos I, Simeonidis E, Papatheanasiou E, Haidich AB, Anastasopoulos N, Natsis K (2016) The clinical impact of platelet-rich plasma on tendinopathy compared to placebo or dry needling injections: a meta-analysis. *Phys Ther Sport* 17:87–94.
- Gulzar Saeed Ahmad, Muhammad Ah et al Tennis elbow: Role of local steroid injection. *J Ayoub Med Coll Abbottbad*, 2012; 24 (2).
- Krey D, Borchers J, Mc Carney K (2015) Tendon needling for treatment of tendinopathy: a systematic review. *Phys Sports Med* 43:80–86.
- De Smedt T, DeJong A, Van Leemput W, Lieven D, Van Glabbeek F (2007) Lateral epicondylitis in tennis: update on aetiology, bio mechanics and treatment. *Br J Sports Med* 41:816–819.
- Shiri R, Viikari-Juntura E. Lateral and medial epicondylitis: role of occupational factors. *Best Pract Res Clin Rheumatol* 2011;25(1):43–57.
- Viola L. A critical review of the current conservative therapies for tennis elbow (lateral epicondylitis). *Australas J Chiropr Osteopathy* 1998;7(2):53–67.
- Rabago D, Best TM, Zgierska AE, Zeisig E, Ryan M, Crane D (2009) A systematic

- review of four injection therapies for lateral epicondylitis: prolotherapy, polidocanol, whole blood and platelet rich plasma. *Br J Sports Med* 43:471–481.
16. Mishra AK, Skrepnik NV, Edwards SG, Jones GL, Sampson S, Vermillion DA, Ramsey ML, Karli DC, Rettig AC (2014) Efficacy of platelet-rich plasma for chronic tennis elbow: a double-blind, prospective, multicenter, randomized controlled trial of 230 patients. *Am J Sports Med* 42:463–471.
 17. Smidt N, et al. Corticosteroid injections for lateral epicondylitis: a systematic review. *Pain*. 2002;96:23–40.
 18. Altay T, et al. Local injection treatment for lateral epicondylitis. *Clin Orthop Relat Res*. 2002;398:127–30.
 19. Lindenhovius A, et al. Injection of dexamethasone versus placebo for lateral elbow pain: a perspective, double-blind, randomized clinical trial. *J Hand Surg*. 2008;33A:909–19.
 20. Newcomer KL, et al. Corticosteroid injection in early treatment of lateral epicondylitis. *Clin J Sport Med*. 2001;11:214–22.
 21. Bayat M, Raeissadat SA, MortazavianBabaki M, Rahimi-Dehgolan S: Is dextrose prolotherapy superior to corticosteroid injection in patients with chronic lateral epicondylitis?: a randomized clinical trial. *Orthop Res Rev*. 2019, 11:167-75.