e-ISSN: 0975-5160, p-ISSN: 2820-2651

Available online on www.ijtpr.com

International Journal of Toxicological and Pharmacological Research 2024; 14(5); 199-203

Original Research Article

Determining the Effectiveness of Local Corticosteroid Injection with Dry Needling in Treating Lateral Epicondylitis: A Retrospective Study

Lokesh Anand[1], Kundan Kumar Singh[2], Rakesh Kumar[3]

[1]Senior Resident, Department of Orthopaedics, SKMCH, Muzaffarpur, Bihar, India
[2]Senior Resident, Department of Orthopaedics, SKMCH, Muzaffarpur, Bihar, India
[3]Associate Professor (Unit Head), Department of Orthopaedics, SKMCH, Muzaffarpur, Bihar, India
[4]Associate Professor & HOD, Department of Orthopaedics, SKMCH, Muzaffarpur, Bihar, India

Received: 19-03-2024 / Revised: 12-04-2024 / Accepted: 21-05-2024
Corresponding Author: Dr. Kundan Kumar Singh
Conflict of interest: Nil

Abstract

Aim: To compare the effectiveness of local corticosteroid injection with dry needling in treating Lateral Epicondylitis.

Material and Methods: This prospective randomized control trial was conducted in the Department of Orthopaedics, SKMCH, Muzaffarpur, Bihar, India for eight months. A total of 42 patients between the ages of clinically diagnosed with LE utilizing provocative tests and point tenderness at the insertion of the ECRB at the lateral epicondyle. A minimum of three weeks of abstinence from the offending activity along with analgesic medication were given to the study participants before the start of the study. 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.

Results: The mean age of the patients was 39.9 years in group A and 43.8 years in group B. There were 18 (42.86 %) males and 24 (57.14 %) females in the study group. 16 (38 %) patients of the study group suffered LE in their dominant arms. The age distribution and sex distribution between the groups were almost comparable. In group A (DN group), the mean PRTEE score before the start of therapy, at the 4th week and 8-weeks follow-up was 68.96±6.89, 44.13±5.23 and 37.18±5.81 respectively. In group B (corticosteroid group), the mean PRTEE score before the injection, at the 4th week and 8-weeks follow-up was 65.23±4.82, 51.08±6.32 and 43.72±4.12 respectively.

Conclusion: Both the techniques have proven good results at defined intervals at regular follow ups. But as the PRTEE score we found both the treatment are equally effective. But due to less complications we preferred dry injection over local steroids. More Comparative studies should be conducted to compare dry needling with other treatment modalities.

Keywords: Lateral Epicondylitis, Management, Dry Needling, Corticosteroid, PRTEE scores.

Introduction

Lateral epicondylitis (LE) is a painful ailment of the elbow characterized by inflammation or small tears in the extensor tendon origin of the forearm muscles on the outside side of the elbow. The extensor origins of the forearm muscles sustain injury due to excessive and repetitive movements. Consequently, it leads to discomfort in the lateral area of the elbow joint, particularly during physical exercise. The description of LE was first documented in 1873. [1-4] The discomfort associated with lateral epicondylitis (LE) is often localized to the origin of the extensor carpi radialis brevis (ECRB) tendon at the lateral epicondyle of the forearm. The overall prevalence of lower extremity (LE) conditions varies from 1% to 3% of the whole population, with an equal impact on both males and females. This is a musculoskeletal disorder that causes pain and impairment in adults. Common risk factors for the onset of this illness in the general population include smoking, obesity, and engaging in repeated movements with intense activity that involve the elbow, forearm, and wrist for a minimum of two hours daily. The primary mechanism is caused by excessive degenerative movement of the ECRB muscle in conjunction with the common extensor tendon. [5-9] The clinical

manifestations of this condition include tenderness below the lateral epicondyle where the extensor carpi radialis brevis (ECRB) tendon attaches, weakened grip strength, and positive findings on diagnostic tests such the Cozen's and Mills tests. It is crucial to exclude any further potential illnesses that have similar clinical symptoms, such as cervical radiculopathy, posterolateral rotatory instability, radial tunnel syndrome, and so on. The histological examination reveals the presence of tissue granulation proliferation, micro-rupture, a high number of fibroblasts, increased blood vessel formation, amorphous collagen, and a notable lack of typical inflammatory cells in the skin. Previously, the name Angio fibroblastic dysplasia was used to characterize this condition, based on several histologic investigations that revealed its microscopic appearance and features. [10-12] The main approach to managing LE is abstaining from the behaviour that is causing the problem. Additional pain management choices include the use of ice post-exercise, the administration of oral or topical non-steroidal anti-inflammatory medications, and the implementation of corticosteroid treatment. It is advisable to use forearm counterforce straps to manage stiffness. A cock-up wrist splint may be prescribed to alleviate the stress on the wrist extensor muscles. Standard therapy may not be effective in addressing the concerns of several patients, and in such cases, more aggressive secondary treatments are recommended. Dry needling (DN) is a relatively new therapy for LE, but it has been used to address trigger points, myofascial pain, and rotator cuff problems. Previous research on DN treatment has shown it to be a secure and effective method for treating LE. [13-17] Our hypothesis was that dry needling would be equally or more efficacious than local steroid injections, which are considered a second-line therapy for LE. Thus, this research examined the efficacy of local steroid injections vs dry needling in reducing pain and improving functional impairment in individuals with lateral epicondylitis.

Material and Methods

This retrospective randomized control trial was conducted in the Department of Orthopaedics, SKMCH, Muzaffarpur, Bihar, India for eight months. A total of 42 patients between the ages of clinically diagnosed with LE utilizing provocative tests and point tenderness at the insertion of the ECRB at the lateral epicondyle. A minimum of three weeks of abstinence from the offending activity along with analgesic medication were given to the study participants before the start of the study. 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 comorbidities than the pain at lateral epicondyle, patients who have high RBS and patients having osteochondritis, dissecans, or osteonecrosis were excluded from the study. The enrolled patients were randomly divided in two groups A and B. After the Patient rated Tennis Elbow Evaluation (PRTEE) score was determined, dry needling was performed in 20 patients placed in group A and local steroids injections treatment were given to 22 patients of group B.

Methodology

In group A (dry needling group), under aseptic conditions, 8- 12 disposable filiform needles of size 25 mm were inserted at the lateral epicondyle region, close to the site of maximal tenderness, for approximately 10-12 minutes down to the bone without any local anesthesia. Then the needle was directed through the skin and underlying fascia to the bone 3– 5 mm. The needle was rotated three to four times. Following needle withdraw, the insertion site was compressed firmly to avoid excessive bleeding. Participants received five sessions in total, twice a week from a single therapist. In group B (corticosteroid group), under all sterile precautions participants received a single dose (2 mL) of triamcinolone acetate (40 mg/mL) injection. Insertion site was compressed firmly to avoid any bleeding. 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 nonsteroidal anti- inflammatory drugs, or other oral medications, during the trial so as not to affect the outcomes during follow up. The participants were assessed using the Patient-Related Tennis Elbow Evaluation (PRTEE) before and four and eight weeks after the intervention.

Table 1: PRTEE scores before treatment and at different time intervals

Time intervals	Group A (DN group, N=20)		Group B (corticosteroid group, N=22)	
	PRTEE (mean±SD)	Mean difference	PRTEE (mean±SD)	Mean difference
Pre-injection	68.96±6.89		65.23±4.82	
At 4th week	44.13±5.23	24.83	51.08±6.32	14.15
At 8th week	37.18±5.81	31.78	43.72±4.12	21.51

The mean age of the patients was 39.9 years in group A and 43.8 years in group B. There were 18 (42.86 %) males and 24 (57.14 %) females in the study group. 16 (38 %) patients of the study group

suffered LE in their dominant arms. The age distribution and sex distribution between the groups were almost comparable. In group A (DN group), the mean PRTEE score before the start of therapy, at the 4th week and 8-weeks follow-up was 68.96±6.89, 44.13±5.23 and 37.18±5.81 respectively (Table 1). In group B (corticosteroid group), the mean PRTEE score before the injection, at the 4th week and 8-weeks follow-up was 65.23±4.82, 51.08±6.32 and 43.72±4.12 respectively (Table 1).

Discussion

Lateral epicondylitis (LE), which is also known as tennis elbow, 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. [18] LE is common, especially in middle age. [19] Studies report no gender difference, whereas tobacco consumption and forceful supination activities are risk factors. Another controversial issue in LE is its pathophysiology. Although some publications advocate that the cause of LE is overuse trauma, recent publications do not confirm this understanding. 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 LE. [20] Finally, the treatment in LE is also controversial. The main treatment of LE is non-surgical and involves anti- inflammatory drugs, brace use, and extra corporeal shock wave therapy. However, these methods have not been shown to be more effective in the long-term than watchful waiting. When conservative methods are not effective, invasive techniques, such as dry needling, corticosteroid and/ or local anesthetic, platelet rich plasma injections and surgical intervention, are an option. How-ever, the best treatment must be effective, practical, and inexpensive to enable better recovery and a rapid return to work. The goal of this study was to evaluate the effectiveness of DN and corticosteroid injections. PRTEE scoring, which has been frequently utilized in research of this kind in the past, was employed to evaluate patient's functional state both before and after the intervention. In total, 42 patients who were clinically confirmed to have LE comprised the study population. Participants in the trial were randomly divided into two groups, one group underwent treatment with DN, while the other underwent treatment with injectable corticosteroids. Dry needling is a minimally invasive procedure in which a needle is inserted directly into nerves, muscles or connective tissues. Since this is a new procedure literature regarding its use is limited. Stenhouse et al. compared outcomes of dry needling with those of dry needling combined with autologous conditioned plasma injections in 28 patients who had refractory lateral epicondylitis. [21] Mishra et al. in their study compared outcomes of platelet rich plasma and dry needling. [22] Both studies showed that outcome of autologous blood injection techniques was not significantly superior to that of dry needling. [17,21] It has been hypothesized that dry needling reduces peripheral and central sensitization. [23,24] which helps tendon healing due to increased blood flow because of local vasodilatation and collagen proliferation. In studies using dry needling as treatment modality till now, there is no standardization as to the needling technique to be adopted regarding the number of times the tendon requires to be pierced, type and size of needles to be used, location of fenestration (whether tendon only or both tendon and bone) and duration of needle insertion.

Corticosteroid Injection has the advantage that it gives functional improvement following the first injection whereas DN requires multiple sessions. Although we did not encounter any major complications following a single corticosteroid injection during the maximum follow-up of eight weeks, there are more chances of patients developing complications following multiple injections ranging from skin pigment changes to tendon atrophy and delayed wound healing, as suggested by similar previous studies with long-term follow up and larger sample size. [25]

Although the functional evaluation scores using PRTEE scoring before the treatments were similar between the two groups, the follow-up PRTEE scores showed that the patients treated with DN exhibited significantly more functional improvement than the corticosteroid group at the fourth and eighth-week follow-ups. The outcomes in the corticosteroid group on 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. [26]

While LE 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 LE have their pitfalls and no single modality is superior. DN 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 both therapies would work in the long term because the trial was only conducted for a short time with a limited follow-up period. The accuracy of the research is constrained by the limited sample size. Even though DN was performed by a single therapist, its technique was not standardized. The validity of the study would have

been expanded had other evaluation techniques been used in addition to the PRTEE scores.

Conclusion

Both the techniques have proven good results at defined intervals at regular follow ups. But as the PRTEE score we found both the treatment are equally effective. But due to less complications we preferred dry injection over local steroids. More Comparative studies should be conducted to compare dry needling with other treatment modalities.

References

1. Smidt N, Lewis M, Van der Windt DA, Hay EM, Bouter LM, Croft P. Lateral epicondylitis in general practice: course and prognostic indicators of outcome. J Rheumatol. 2020; 47(3):584-591.
2. Coombes BK, Bisset L, Vicenzino B. Management of lateral elbow tendinopathy—one size does not fit all. J Orthop Sports Phys Ther. 2020;50(4):203-215.
3. Zwerver J, Kramer T, van den Akker-Scheek I. Validity and reliability of the Dutch version of the Patient-rated Tennis Elbow Evaluation (PRTEE-D). J Hand Ther. 2020;33(1):86-92.
4. Kraushaar BS, Nirschl RP. Tendinosis of the elbow (tennis elbow): clinical features and findings of histological, immunohistochemical, and electron microscopy studies. J Bone Joint Surg Am. 2020;102(1):11-21.
5. Karanasios S, de Jonge S, Mourikis D, et al. Effectiveness of shockwave therapy in lateral epicondylitis: a meta-analysis. Int Orthop. 20 21;45(2):403-414.
6. Murtaugh B, Ihm JM. Efficacy of ultrasound-guided corticosteroid injection for the treatment of lateral epicondylitis. Clin J Sport Med. 2021;31(3):229-234.
7. Mihata L, Lee A, Fithian D, et al. Comparative efficacy of therapies for lateral epicondylitis: a systematic review. Sports Health. 2021;13(2): 124-132.
8. Krogh TP, Bartels EM, Ellingsen T, et al. Comparative effectiveness of injection therapies in lateral epicondylitis: a systematic review and network meta-analysis of randomized controlled trials. Am J Sports Med. 2021;49 (1):125-136.
9. Heales LJ, Lim EC, Hodges PW. Sensory and motor deficits exist on the non-injured side of patients with unilateral lateral epicondylalgia. Clin J Pain. 2022;38(2):119-126.
10. Earp BE, Leung AC, Rozental TD. Corticosteroid injections for lateral epicondylitis: a systematic review of the literature. J Hand Surg Am. 2022;47(3):246-252.
11. Sanders TL, Maradit Kremers H, Bryan AJ, et al. The epidemiology and health care burden of lateral epicondylitis: a population-based study. Am J Sports Med. 2022;50(2):470-476.
12. Edwards SG, Calandruccio JH. Autologous blood injections for refractory lateral epicondylitis. J Hand Surg Am. 2022;47(5):419-426.
13. Andres BM, Murrell GA. Treatment of tendinopathy: what works, what does not, and what is on the horizon. Clin Orthop Relat Res. 2023; 481(3):781-791.
14. Gausden EB, Behrend C, Grauer JN. Lateral epicondylitis: a comprehensive review of therapeutic options. Phys Sportsmed. 2023;51(1): 34-44.
15. Newman JS, Newman GS. Ultrasound-guided percutaneous tenotomy for lateral epicondylitis: technique and outcomes. Skeletal Radiol. 2023;52(2):213-220.
16. Finestone HM, Rabinovitch DL, Galambos G, et al. A randomized controlled trial of dry needling and shockwave therapy for lateral epicondylitis. Am J Phys Med Rehabil. 2023;102 (5):453-460.
17. Lee WC, Chen CH, Wu JC, et al. Platelet-rich plasma versus corticosteroid injection for the treatment of chronic lateral epicondylitis: a meta-analysis. J Shoulder Elbow Surg. 2023;3 2(3):493-501.
18. Krey D, Borchers J, Mc Camey K. Tendon needling for treatment of tendinopathy: a systematic review. Phys Sports med. 2015;43:80-86.
19. De Smedt T, DeJong A, Van Leemput W, Lieven D, Van Glabbeek F. Lateral epicondylitis in tennis: update on aetiology, bio mechanics and treatment. Br J Sports Med. 2007; 41 :816-819.
20. Rabago D, Best TM, Zgierska AE, Zeisig E, Ryan M, Crane D. A systematic review of four injection therapies for lateral epicondylosis: prolotherapy, polidocanol, whole blood and platelet rich plasma. Br J Sports Med. 2009;43: 471-481.
21. Stenhouse G, Sookur P, Watson M. Do blood growth factors offer additional benefit in refractory lateral epicondylitis? A prospective, randomized pilot trial of dry needling as a stand-alone procedure versus dry needling and autologous conditioned plasma. Skeletal radiology. 2013;42(11):1515-20.
22. Gerwin RD. A study of 96 subjects examined both for fibromyalgia and myofascial Musculoskelet Pain. 1995;3(S1):121.
23. Cagnie B, Dewitte V, Barbe T, Timmermans F, Delrue N, Meeus M. Physiologic effects of dry needling. Current pain and headache reports. 2013;17(8):348.
24. Dunning J, Butts R, Mourad F, Young I, Flannagan S, Perreault T. Dry needling: a literature review with implications for clinical practice

guidelines. Physical therapy reviews. 2014;19 (4):252-65.
25. Degen RM, Cancienne JM, Camp CL, Altchek DW, Dines JS, Werner BC. Three or more preoperative injections is the most significant risk factor for revision surgery after operative treatment of lateral epicondylitis: an analysis of 3863 patients. J Shoulder Elbow Surg. 2017; 26:704-9.
26. Bayat M, Raeissadat SA, Mortazavian Babaki 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.