



International Journal of Orthopaedics Sciences

E-ISSN: 2395-1958
P-ISSN: 2706-6630
IJOS 2024; 10(1): 118-121
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<https://www.orthopaper.com>

Received: 15-01-2024

Accepted: 11-02-2024

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A study of local corticosteroid injection versus dry needling in Lateral Epicondylitis (LE)

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DOI: <https://doi.org/10.22271/ortho.2024.v10.i1b.3506>

Abstract

Introduction: Lateral epicondylitis (LE) is an inflammation or micro-tearing of the tendons that join the forearm muscles on the lateral aspect of the elbow. The first line treatment for LE is topical and oral anti-inflammatory drugs from ice applications and brace used. If the first line treatment fails second line treatment generally invasive are offered and second-line therapeutic regimens include saline, corticosteroid or platelet-rich plasma injections. Dry needling is relatively new for treating the same. We hypothesized that dry needling would be as effective as second-line treatment for LE. The aim of this study was to compare the outcomes of second-line treatment local steroids and dry needling.

Methods: In this study a total of 42 patients, clinically diagnosed with LE utilizing provocative tests and point tenderness at the insertion of the ECRB at the lateral epicondyle to compare the outcomes of second-line treatment local steroids and dry needling.

Results: 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 epicondylalgia (LE), more commonly known as tennis elbow, is the most common chronic musculoskeletal pain condition affecting the elbow, causing significant pain, disability and lost productivity. Approximately 40 % of people will experience LE at some point in their life ^[1]. It most commonly presents in men and women aged between 35 and 54 years ^[2]. The reported point prevalence of LE is between 1 and 3 % within the general population ^[3], and four to seven per1000 patients visiting general medical practitioners ^[4, 5] Up to 50% of all tennis players also experience some type of elbow pain, with 75 to 80% of these elbow complaints attributable to LE ^[6, 7]. LE most commonly affects the dominant arm, particularly when performing repetitive activity, so it is not surprising that the greatest burden of LE is among manual working populations where musculoskeletal upper limb injuries account for some of the longest work absences ^[8]. Up to 17% of workers within industries that involve highly repetitive hand tasks, such as meat processing and factory workers, experience LE ^[9].

LE is a diagnosis based on clinical history and physical examination, with diagnostic imaging best used when a differential diagnosis is likely. LE 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 ^[10]. While LE is thought to result from an overload of the forearm extensor muscles ^[7], the pain may have an insidious onset with no specific causal activity ^[11].

The first-line treatment for LE 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 [12, 13]. Dry needling is relatively new. Although it has been used in the management of myofascial pain [14], low back pain [15], trigger points [16], and rotator cuff tears [16], there are only few reports of dry needling in LE [17]. We hypothesized that dry needling would be at least as effective for LE as local steroids injection which is second line treatment. Therefore, this study compared the pain relief and the improvement in functional disability of local steroids injection treatment with those of dry needling in LE patients.

Methods

This prospective randomized control trial was conducted at Govt. Hospital for Bones and Joints Surgery, an associated hospital of Govt. Medical College, Srinagar from January 2021 to December 2022 after obtaining ethical clearance from the institute. 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.

Procedure

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 anaesthesia. 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.

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 (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).

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 4 th week	44.13±5.23	24.83	51.08±6.32	14.15
At 8 th week	37.18±5.81	31.78	43.72±4.12	21.51

Discussions

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 [19]. Another controversial issue in LE is its pathophysiology. Although some publications advocate that the cause of LE is overuse trauma [12], 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 [12, 18]. However, these methods have not been shown to be more effective in the long-term than watchful waiting [20]. 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 [17]. However, 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.

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How to Cite This Article

Wani AA, Faizan SSM, Wani RM, Malik S. A study of local corticosteroid injection versus dry needling in Lateral Epicondylitis (LE). *International Journal of Orthopaedics Sciences.* 2024;10(1):118-121.

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