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ORIGINAL ARTICLE

INJECTION OF METHYLPREDNISOLONE AND LIDOCAINE IN THE TREATMENT OF MEDIAL EPICONDYLITIS: A RANDOMIZED CLINICAL TRIAL

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Objective – Conservative treatment of medial epicondylitis including splinting, physical therapy, nonsteroidal antiinflammatory drugs (NSAIDs), and local injection of steroids has been reported to be successful in most reported cases. In the present study, we evaluated the effectiveness of local injection of steroids.

Methods – Over a period of 5 years (1997 – 2001), we randomized 38 patients (40 elbows) seen in our private clinics into two groups. The treatment group (20 elbows) received one injection of 40 mg methylprednisolone and 1% lidocaine, and the control group (20 elbows) received one injection of normal saline and 1% lidocaine. Patients in both groups were given standard NSAIDs, physical therapy, and splinting. Pain severity was assessed at 2, 4, and 12 months.

Results – The severity of pain in both groups was same before the treatment and there was no significant difference between the two groups. The difference in pain score between the two groups at 2 months was statistically significant (p = 0.01). At 4 months, the mean pain scores in the two groups were similar (p = 0.673) and there were no significant differences between the two groups at 12 months (p = 0.942, Mann-Witney test).

Conclusion – Since local injection of a steroid had only short-term benefits, we do not recommend it for the treatment of medial epicondylitis. NSAIDs, splinting, and physical therapy provide the best conservative approach in this condition; steroid injection near a sensitive nerve (ulnar nerve) is not justified.

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Keywords • epicondylitis • methylprednisolone • tennis elbow

Introduction

Medial epicondylitis is a common, yet incompletely understood, condition of the elbow in adults. Overuse and isolated traumatic events have been implicated in the etiology.[1] Although much less common, medial epicondylitis is similar to lateral epicondylitis. The origins of the flexor carpi radialis and pronator teres (flexor-pronator mass) are commonly involved and the disease can be either microscopic or macroscopic. It may be accompanied by symptoms of ulnar neuritis, with reports of coexistence ranging from 23 to 50% in some series.[2] Conservative treatement is the mainstay of management[3] and the rate of success of non-operative treatment has been reported to be 88 to 96%.[4]

Nonsteroidal antiinflammatory drugs (NSAIDs), splinting, and occasional steroid injection provide sustained relief in most patients. If nonoperative treatment fails, excision of the diseased tendon origin and reattachment are usually successful.[3] The presence of associated compressive neuropathies of the ulnar nerve may make the precise diagnosis and subsequent treatment more difficult.[5] This entity must be differentiated from ulnar nerve neuropathy and medial collateral ligament instability.[3]

We performed a clinical trial to evaluate the

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efficacy of a local injection of methylprednisolone to treat medial epicondylitis.

Patients and Methods

Over a period of 5 years (1997 – 2001), 40 elbows (38 patients) with a diagnosis of isolated medial epicondylitis, seen at our private clinics in Mashad city, were randomized into one of the two groups.

Medial epicondylitis was diagnosed on the basis of local tenderness over the origin of the flexor-pronator muscle mass, tenderness over the medial epicondyle of the humerus, and increased pain on pronation of the forearm and flexion of the wrist against resistance with the elbow extended. The onset of symptoms was gradual in all patients with no history of acute trauma. Twenty-eight of the involved elbows were on the dominant side. In two patients, both elbows were involved.

Patients with associated injuries of the upper limb, carpal tunnel syndrome, lateral epicondylitis (tennis elbow), ulnar neuropathy, medial collateral ligament instability, and those who had a previous injection of steroids were not included in the study. Coexistent ulnar neuritis was diagnosed on the basis of local tenderness over the ulnar nerve (in the cubital tunnel) with hypoesthesia (decreased sensation compared with the contralateral side, as assessed by application of cotton wool), paresthesia (tingling or numbness) or both in the distribution of the ulnar nerve; positive Tinel sign over the ulnar nerve; positive elbow flexion test; positive nerve compression test; and wasting of hypothenar muscles (considered an indication of motor dysfunction of the ulnar nerve).

Elbow stability was tested with the elbow fully extended. One hand was used as a fulcrum, while the other hand was used to attempt to abduct and adduct the forearm. All patients with unstable elbows were excluded from the study.

Twenty elbows were randomly assigned to the treatment group and were treated with one injection containing 40 mg of methylprednisolone (Aburayhan Company, Tehran, Iran) and 1% lidocaine (Pasteur Institute of Iran). The other 20 elbows were randomly assigned to the control group and treated with one injection containing saline solution (Saheed Ghazi Company, Tabriz, Iran) and 1% lidocaine. There were 14 men and 6 women in the treatment group and 16 men and 4 women in the control group. Nineteen of the 38 patients were manual laborers, four were nurses, one was a music student who played the organ, ten were homemakers, and four were salesmen.

Patients in both groups were given standard NSAIDs and physical therapy. All were told to avoid the activities that caused pain. The pain score was determined using a modification of the grading system of Nirschl and Pettrone (Table).[6] The pain score for each patient was determined before the treatment and at 2, 4, and 12 months after treatment.

Data were analyzed using SPSS-9 software (Statistical Procedures for Social Sciences; Chicago, Illinois, USA). The differences between the two groups were tested using Fisher's exact test (more than 25% of cells had an expected count less than 5) and were considered statistically significant at a two-tailed probability of type-I error of less than 5% ($p < 0.05$).

Results

The mean pain intensity (± standard deviation) before treatment was 2.75 ± 0.96 in the treatment group and 2.65 ± 0.93 in the control group ($p = 0.738$, Mann-Witney test).

After 8 weeks, pain was less severe in the treatment group (1.40 ± 0.82) than in the control gourp (2.20 ± 0.83, $p = 0.010$). However, there was no difference at 4 months (1.4 ± 0.82 vs 1.5 ± 0.83, $p = 0.673$) or 1 year (0.7 ± 1.26 vs 0.8 ± 1.36, $p = 0.942$) (Figure).

Table. Pain scores in relation to physical activities. A modification of the grading system of Nirschl and Pettrone.[6]

0	Full activity with no pain
1	No pain with normal activity and mild pain with strenuous activity
2	Mild pain with normal activity and moderate pain with strenuous activity
3	Moderate pain with normal activity and severe pain with strenuous activity
4	Severe pain with normal and strenuous activity

At 1 year after the treatment, most patients in both groups reported less pain than they did before the treatment. However, four patients in the treatment group and four in the control group had no amelioration of their pain and were candidates for surgery. Despite randomization in the study, we compared the sex and age of the patients. The mean

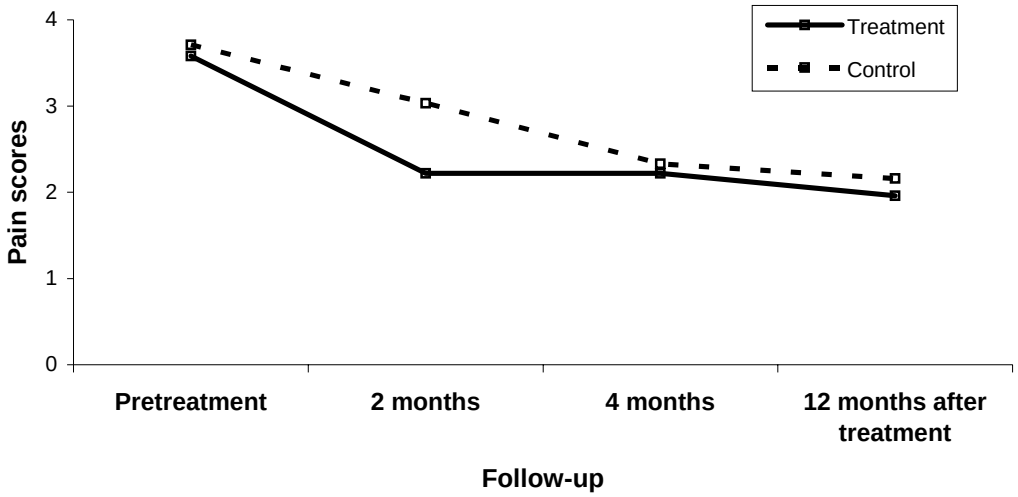

Figure. Pain scores at follow-up.

age was similar in the two groups (42.55 ± 8.89 vs 42.7 ± 7.49 years, $p = 0.880$). There was also no difference between the two groups in regard with the patients' sex ($p = 0.465$).

Facial flushing was noted in four patients 12 to 24 hours after methylprednisolone injection. This resolved spontaneously after 48 to 72 hours.

Discussion

Epicondylitis is the most common disorder of the elbow in adults.[5] The clinical presentations of both medial and lateral epicondylitis have been documented in literature and the success rate of nonoperative treatment has been reported to be 88 to 96%. [4, 7, 8]

Being less common, medial epicondylitis is actually similar to lateral epicondylitis.[3] The presence of associated compressive neuropathy of the ulnar nerve may make the precise diagnosis and subsequent treatment more difficult. [9 – 11] Nirschl reported ulnar neuroparaxia in 60% of his patients with medial epicondylar symptoms.[12] Medial epicondylitis is generally considered to start as a microtear which usually occurs in the interface between the origins of the pronator teres and the flexor carpi radialis with the subsequent formation of fibrosis and granulation tissue.[1, 4, 13] With chronic stress, the microtear may result in mucoid degeneration of the tendinous origin and formation of reactive granulation tissue. This granulation tissue has been shown to contain large numbers of free nerve endings, which may explain the pain associated with this condition.[4, 14]

Medial epicondylitis is classified on the basis of the presence and severity of concomitant ulnar neuropathy: type IA has no associated symptoms of ulnar neuropathy; type IB has mild symptoms; and type II has moderate or severe symptoms.[5]

Conservative treatment is the mainstay of management and is similar to that of lateral epicondylitis. It is directed at decreasing the inflammatory process with NSAIDs or local injection of corticosteroids, and at preventing continued mechanical stress with the use of a wrist splint or a counterforce brace.[11] The splint holds the wrist in a neutral position to rest the flexor- pronator tendon mass. Obviously, this does not limit the rotation of the forearm and is tolerated better than an orthosis that restricts forearm pronation. The counterforce brace is a circumferential orthosis, usually with a pad in line with the axis of the involved muscles—in this case, the pronator teres and flexor carpi radialis.[5, 15]

In the present study, we compared pain severity in two groups of patients, a treatment group and a control group. We did not perform electromyography or nerve conduction velocity studies because all patients had type I medial epicondylitis with no associated symptoms of ulnar neuropathy. Patients with ulnar neuropathy were excluded from the study.

After 12 months, the severity of pain was the same in both groups. Steroid injection did not reduce pain. Twenty percent of the patients in each group failed to respond to conservative treatment and were considered for surgery. Thus, failure rates of conservative treatment were the same in both groups.

We concluded that, because of the short-term benefits of steroid injection and its ineffectiveness in long-term follow-up, the use of steroid injection in conservative treatment of medial epicondylitis is not justified. The best conservative approaches for this condition are restriction of activities, splinting, NSAIDs, and physical therapy.

Surgical techniques are reserved for the patients in whom nonoperative treatment has been unsuccessful, especially those with ulnar nerve neuritis.

Steroid injection near a sensitive peripheral nerve (ulnar nerve) to treat medial epicondylitis is neither useful nor harmless.

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