



Review

Clinical Evidence for treating chronic lateral epicondylitis with ozone

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Keywords

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Abstract

Objective: Chronic lateral epicondylitis, also known as tennis elbow, is a common cause of elbow pain and dysfunction. It is generally believed to be due to a strain of the common extensor origin, but fibrosis and micro-tearing in extensor carpi radialis brevis are also possible. In acute conditions, a period of rest and or modification of activity may allow the condition to settle. Controversy exists regarding the best treatment strategy for chronic lateral epicondylitis. NSAIDs, Physical therapy, bracing, injections with corticosteroids, and more recently biologics are among the mainstream treatments. The use of ozone therapy in pathologies of the musculoskeletal system has been well documented. Is it possible that ozone could offer a better solution to the management of patients suffering from chronic lateral epicondylitis? The purpose of this paper is to review the evidence. Method: Through an online search of PubMed and ISCO3 databases two studies which included the use of ozone in patients with chronic lateral epicondylitis were found. One retrospective cohort study performed with 89 patients compared effects of ozone injection to extracorporeal shockwave therapy on management of pain. Another retrospective study with 80 patients compared ozone injection to corticosteroid injection and alleviation of pain. Conclusion: Results of available studies on the effect of ozone in treatment of chronic lateral epicondylitis demonstrate a superior action of ozone for the long-term elimination of pain when compared to corticosteroid injection and shockwave therapy.

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Introduction

Lateral epicondylitis is a common overuse syndrome related to excessive wrist extension. Also referred to as tennis elbow, it is equally if not more common in non-tennis players. Most commonly adults between 35-50yrs. Lateral epicondylitis is commonly associated with overuse injury and strain from activities involving repetitive gripping or wrist extension, radial deviation, and/or forearm supination ¹. The primary pathology involved in this condition is degeneration of the extensor carpi radialis brevis (ECRB) tendon, usually within 1cm of its attachment to the common extensor origin on the lateral epicondyle. Histologically, there is an invasion of fibroblasts and vascular granulation tissue termed angiofibroblastic hyperplasia. This tissue has a large number of nociceptive nerve endings, resulting in pain. With continued use, these degenerative changes may lead to the formation of microscopic tears and scarring within the tendon. Conversely, a tear may be the primary pathology, with degeneration being secondary. Because this is primarily a mechanical process, it might be called tendinosis rather than tendinitis. An inflammatory component may be present as a result of an exacerbation of the underlying lesion, probably secondary to microscopic tearing. ^{1,2} Rather than an inflammatory response, it is theorized that epicondylitis is a result of a suboptimal healing response to repetitive microtrauma in addition to vascular deprivation at the tendon origin. The degree of angiofibroblastic infiltration also appears to correlate with pain and duration of symptoms ³.

Diagnosis is made on the basis of physical examination. Typically, the most tender area of palpation is approx. 1 cm distal to the lateral epicondyle on the ECRB tendon. Pain is reproduced by resisted wrist extension, with the wrist pronated and radially deviated (Mills 'test).

Conservative treatment of chronic lateral epicondylitis involves rest, modification of activity, non-steroidal anti-inflammatory drugs, orthosis, physical therapy, and corticosteroid injections, injection of biologics. Injection of corticosteroid into the area of greatest tenderness has been considered the "gold standard" in treatment although recurrence of symptoms is not rare after the initial relief of pain. Despite its well-documented usefulness, there is much controversy about the use of corticosteroids due to their possible long-term effects on soft tissue.

The therapeutic benefits of ozone on the pathology of the musculoskeletal system have been well documented⁴. Ozone has been proven beneficial due to its anti-inflammatory, analgesic, and antioxidant properties. Unlike corticosteroid which in the long term produces weakness of ligaments and tendons, ozone has a beneficial effect on tissue metabolism. With the use of a quality medical ozone generator, it is possible to produce precise concentrations of ozone for injection. According to the Madrid Declaration on ozone Therapy (3d ed.,2020), Epicondylitis may be classified as having a Level B level of evidence, meaning that the clinical benefits of ozone outweigh the potential risks⁵. Through the ISCO3 database and Pub Med search, two studies including the use of ozone in patients with chronic lateral epicondylitis were identified. Ulusoy, Bilge,⁶ in 2019, performed a study on 80 patients with chronic lateral epicondylitis. They compared the effectiveness of corticosteroid injection to O₂/O₃ therapy on the reduction of pain. Corticosteroid injection was administered once a week for 3 weeks, while O₂/O₃ injection was administered eight times every 3 days. Both treatments were shown to significantly reduce pain. O₂/O₃ showed better results than corticosteroids at three, six, and nine months after the injections, suggesting that O₂/O₃ could be considered an effective therapeutic option in the treatment of chronic lateral epicondylitis. In another study by Ali Bilge, C.Gonen Aydin⁷ the use of ozone injection and extracorporeal shockwave therapy in the treatment of chronic lateral epicondylitis were compared⁷. They performed a retrospective study on 89 patients diagnosed with CLE. Forty were treated with ESWT 6 times with 3-day intervals and forty-nine were given ozone injections subcutaneously with doses between 5-20 microg/ml (depending on patients tolerance)for a total of eight sessions at three-day intervals. Pain at rest, on compression, and during activity was examined before and after the injection of ozone or ESWT at the 3rd,6th, and 9th months, results were categorized according to VERHAAR criteria (pain relief, patient satisfaction, grip strength, presence of provoked pain on resisted wrist extension). The conclusion of the study found a statistically significant difference between the two treatment groups. The ozone group was more successful in pain management than the ESWT group at the third and ninth month after treatment. In the 6th month, there was no difference between the groups.

Conclusion

Chronic lateral epicondylitis is a painful inflammatory and degenerative disease of the common extensor tendon caused by overuse. In addition to pain, patients suffer from a loss of function resulting in altered activity and work. There is an abundance of studies and knowledge on tendinopathy but debate exists on the pathophysiology of CLE. Mainstream treatment options including rest, analgesics, NSAIDs, Physical therapy, orthosis, corticosteroid injection, biologics injection. Despite advances in treatment, there is still a lack of established standards. Corticosteroids, still considered “gold standard” treatment in many orthopedic clinics have shown poor long-term efficacy and potential adverse effects. Ozone with its potential analgesic, anti-inflammatory, regenerative properties present as a feasible, cost-effective solution to the treatment of chronic lateral epicondylitis. The results of two studies support the use of ozone as an effective, safe and practical option in the treatment of patients with chronic lateral epicondylitis.^{6,7} However, further high-quality research on a larger patient population is needed in order to obtain standardization of treatment protocols.

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