Invited lecture/Review

Physiotherapy Approach for Treating Lateral Epicondilalgia

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Abstract:
Lateral epicondylitis, a tendinopathy affecting forearm extensor muscles, results from overuse and commonly manifests as pain over the lateral humeral epicondyle. The extensor carpi radialis brevis (ECRB) is implicated, particularly during forceful gripping. The condition is prevalent in the 35-45 age group and it affects 1-3% of the population, with symptoms lasting two years and reoccurring after asymptomatic periods. Considering the economic impact of lateral epicondylalgia-related sick leave, therapeutic focus must emphasize long-term as well as short-term efficacy. Treatment approaches include drugs, rest, physiotherapy and surgery. Platelet-rich plasma proves highly effective, reducing pain and work absenteeism. Severe cases may require surgical approach, with studies questioning the benefits of surgery over a placebo. Pain management involves shockwave therapy, ultrasound, friction massage, eccentric exercises, stretching, and orthoses. Shockwave therapy stands out for its rapid pain relief and long-term efficacy. The combination of exercises and kinesiotaping is effective, while high-intensity laser therapy has limited evidence. Functionality improves with manual therapy, stretching, and strengthening exercises. Orthoses may negatively impact hand function. Grip strength correlates closely with functionality, with therapeutic exercise and manual therapy showing significant long-term results.

Keywords: Lateral epicondylalgia, tendinopathy, rehabilitation, physiotherapy approach

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1. Introduction

Lateral epicondylitis is a tendinopathy of the forearm extensor muscles, often caused by overuse or repetitive use (Tarpada et al., 2018). Individuals suffering from tennis elbow often experience pain localized around the lateral humeral epicondyle. Pain tends to intensify during elbow flexion, particularly when the wrist is in a pronated position and extended against resistance. The consensus among many researchers is that the origin of the extensor carpi radialis brevis (ECRB) is the key contributor to the symptoms associated with lateral epicondylitis. From a biomechanical standpoint, forceful gripping places the ECRB under maximum strain, especially when the forearm is pronated, and the wrist is flexed and ulnar deviated. Lateral epicondylitis is most prevalent in the individuals aged 35-45, affecting approximately 1-3% of the general population. Symptoms usually last for 2 years, but it usually relapses after asymptomatic periods (Sandhu et al., 2020; Bisset & Vicenzino, 2015).

Due to the increasing economic impact of lateral epicondylalgia-related sick leave, attention must also be given to the short-term effects of therapies that will reduce the duration of work absenteeism.

Different treatment approaches have been proposed, such as drugs, rest, physiotherapy and surgery (Zhong et al., 2020). The first therapeutic step usually involves rest and administration of drugs, providing short-term pain relief but also yielding poor results for problem resolution and relapse prevention (Boden et al., 2019).

Platelet-rich plasma treatment proves to be a highly effective therapy; research indicates that, in addition to reducing pain and improving function, the time of absence from work is shortened even more compared to non-invasive therapies (Alessio-Mazzola et al., 2018). But there is 2-11% of cases severe enough that need surgical removal of diseased tissue. With the surgical approach, immediate pain relief is achieved in 80-97% of cases, with more than 75% of patients with no or minimal pain after one year. Although 1.5% of patients undergo a second surgical procedure in the following 18-24 months (Degen et al., 2018; Holmedal et al., 2019). On the contrary, study by Kroslak and Murrell (2018) showed that surgical excision of the degenerative portion of the ECRB offers no additional benefit over and above placebo surgery for the management of chronic tennis elbow.

Physiotherapeutic treatment is shown to be the most effective, but it should include manual therapy performed under the pain threshold to relieve pain and improve joint range of motion (Zhong et al., 2020).

When assessing the effectiveness of rehabilitation techniques, focus is on pain, limb function, maximum grip strength, and wrist range of motion.

2. Pain management

Research indicates that pain intensity decreases most rapidly (between 3 and 9 sesions) with therapies involving shockwave therapy, ultrasound, friction massage, eccentric exercises, stretching exercises, and orthoses (Landesa-Piñeiro & Leirós-Rodríguez, 2022). Shockwave therapy demonstrates a notable decrease in pain threshold after only three sessions (Yalvaç et al., 2018), whereas ultrasound therapy yields comparable effects after ten sessions, as evidenced by Yan et al. in 2019. The analgesic efficacy of these therapies arises from the stimulation of pain receptors and the activation of unmyelinated C fibers and A delta fibers, initiating the gate control theory of pain (Dedes et al., 2018). Notably, shockwave therapy employs higher energy waves, leading to a more pronounced stimulation of pain receptors (Yan et al., 2019). Moreover, shockwave therapy induces a localized metabolic response characterized by heightened vascularity and reduced adhesion formation. These contribute to the facilitation of the inherent healing processes (Orhan et al., 2004). The effect of shockwave therapy lasts longer than the effect of conventional therapy (thermotherapy, ultrasound, TENS). Shockwave therapy is more effective in the short term for chronic patients, but in the long term, it has a better impact on acute patients (Köksal et al., 2015).

Another randomized contolled study showed the combination of exercises and kinesiotaping can be more effective than exercises alone or with sham taping for up to one month after treatment. There is some high quality evidence that shows positive effect on pain after performing all kind of strenghtening exercises combined (Eraslan et al., 2018).

There is only one high quality study that show positive effect of high-intensity laser therapy in comparison with placebo laser therpy, but the tickness of common extensor tendons did not change at all (Dundar et al., 2015).
For long term pain relief there is evidence that shockwave therapy, manual therapy, eccentric strengthening exercises and corticosteroid infiltration have positive effects up to 1 year after therapy (Köksal, 2015; Olaussen, 2015).

3. Functionality and grip strenght

The relationship between functionality and grip strength demonstrates a notable correlation, wherein grip strength serves as a quantifiable and objective metric. Interventions based on therapeutic exercise and manual therapy obtained good results in the long term and even significantly higher results compared to those based on shockwave therapy, orthoses, and corticosteroids (Landesa-Piñeiro & Leirós-Rodríguez, 2022).
The effect of conventional therapy (stretching and strengthening exercises with education) showed good result but recovery time depends, to a great extent, on the frequency of their execution (Stasinopoulos & Johnson, 2004). Studies show that no kind of strenghtening exercises is superior than other, but there is lack of studies that isolate the effect of particular kind of exercises (Lepley et al., 2017; Stasinopoulos & Stasinopoulos, 2017). It is important to point out that studies show improvement in range of wrist motion after only eccentric exercises (Nowotny et al., 2018). This modality of strenght training also instigates collagen production, diminishes the incidence of inflammation and neovascularization, and mitigates pain through the augmentation of tendinous resistance and desensitization of central nervous pathways involved in pain transmission (Peterson et al., 2014).
Shockwave showed good results but is less efective compared to kinesiotaping which should be used in combination with exercises for longer effect (Giray et al., 2019). Eraslan et al. (2018) assert that the combination of conservative therapy and kinesiotape application is more effective than the combination of conservative therapy and shockwave therapy. According to the three parameters of the Patient-Rated Tennis Elbow Evaluation Scale, the difference before and after therapy is statistically significant in both groups. However, the progress in the group with kinesiotape application is statistically significantly superior. Kinesiotape reduses pain and edema and facilitate motor activity by relieveing motor abnormal muscle tension. They also stimulate mechanoreceptors by applying pressure on the skin, which are effects that have a direct impact on the generation of strenght (Pieters et al., 2020).
Studies show that the use of orthoses can have a negative effect on hand function, reducing mobility and preventing normal elbow movement (Stasinopoulos & Stasinopoulos, 2017). The use of orthoses for 6 weeks in combination with mobility exercises and stretching exercises daily has no positive effect (Yi et al., 2018).

4. Conclusion

Taken together, researchers still haven't agreed on the most effective long-term therapy due to lack of studies showing lasting effects. Additionally, considering the economic consequences related to work absenteeism there is need to find therapies with best short term effect.
The combination of manual therapy, involving deep friction massage, along with streching and eccentric strenghtening exercises yields the most favorable results for functional improvement and increased grip strength in lateral epicondylalgia, furthermore, their cost-benefit ratio is very favourable. Other therapy techniques such as shockwave and ultrasound therapy have the greatest effect on reducing pain intensity. Moreover, research indicates that shockwave therapy achieves the fastest results in pain management.
According to available literature, the rehabilitation of lateral epicondylalgia should be divided into three phases. In the first and second phases, the focus is on reducing pain and improving hand dysfunction. The literature suggests therapy using shockwave therapy in combination with manual therapy (deep friction massage) under pain threshold and stretching exercises. In the second phase, isometric exercises are added to strengthen the wrist extensors and finger extensors. These exercises are then progressed in the third phase, when we focus on grip strenght, where concentric and eccentric

exercises are introduced for the wrist extensors, supinators, and pronators. In all three phases, the application of kinesiotaping can be added. However, it is important that it is applied by a trained person, as incorrect application may not bring positive results.

Conflicts of Interest: The authors declare no conflict of interest.

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