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The Role of Manual Therapy in the Management of Tennis Elbow:A Narrative Review

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ABSTRACT
Tennis elbow, or lateral epicondylitis, is a common overuse injury characterized by pain and tenderness on the lateral aspect of the elbow, primarily affecting the extensor tendons, particularly the extensor carpi radialis brevis (ECRB). risk factors associated with the development of tennis elbow: Age: The peak incidence of tennis elbow occurs between 40 to 50 years of age. In women aged 42 to 46, the incidence can rise to about 10% 2. This age-related risk could be due to degenerative changes in the tendons and muscles as people age, leading to a higher vulnerability to injuries.

Keywords: injuries, tennis, tendons, factors

INTRODUCTION

Tennis elbow, or lateral epicondylitis, is a common overuse injury characterized by pain and tenderness on the lateral aspect of the elbow, primarily affecting the extensor tendons, particularly the extensor carpi radialis brevis (ECRB). risk factors associated with the development of tennis elbow:

Age: The peak incidence of tennis elbow occurs between 40 to 50 years of age. In women aged 42 to 46, the incidence can rise to about 10% 2. This age-related risk could be due to degenerative changes in the tendons and muscles as people age, leading to a higher vulnerability to injuries.

Occupation: Certain occupations that require repetitive wrist and arm movements can increase the risk of developing tennis elbow. Jobs involving gripping, lifting, or repetitive hand movements, such as painting, plumbing, or assembly work, are often associated with this condition 6.

Sports Activities: Although tennis is one of the most recognized causes, it is responsible for only about 5% of cases. Other racquet sports such as squash, badminton, and activities that involve repetitive gripping or wrist extension can also lead to tennis elbow, particularly if proper techniques are not used 6.

Mechanics of Movement: Poor technique in sports or activities that involve the upper limb can contribute significantly to the development of tennis elbow. For example, improper form during racquet sports or lifting can place undue stress on the elbow 6.

Repetitive Motions: Engaging in activities that require repetitive motions of the wrist and arm can lead to cumulative trauma to the elbow. This includes hobbies or activities like gardening, using hand tools, or even typing for extended periods 6.

Previous Injuries: A history of elbow or arm injuries can predispose individuals to tennis elbow. Previous trauma may weaken the tendons or muscles, making them more susceptible to further injury 6.

Grip Strength: Individuals with decreased grip strength may also be at risk. Weakness in the muscles of the forearm can alter the mechanics of the elbow joint, leading to increased stress on the tendons Prevalence and impact of tennis elbow incidence occurs at 40 to 50 years of age, with prevalence in women aged 42 to 46 years increasing to 10%.

The condition can arise from repetitive wrist and arm movements and is prevalent among individuals engaged in manual labor and sports like tennis. While most cases are self-limiting, persistent symptoms can lead to an impact on daily activities and quality of life.

The Rationale for manual therapy to alleviate pain, improve range of motion, and enhance functional recovery. Manual Therapy Techniques for tennis elbow various techniques, including joint mobilization, soft tissue manipulation, and specific therapeutic exercises.

LITERATURE REVIEW

A review of literature was conducted from July to August 2024, searching the PEDRO and PubMed databases for relevant randomized control trail and systematic reviewstudies .

23 articles were found, and after excluding 5 based on titles and abstracts, 4 articles were disregarded after checking their full texts. Ultimately, 14 articles were used in this review because they were related to the topic.

One study by Wallis JA et al. (2024) looked at the pros and cons of manual therapy, prescribed exercises, or both for adults with outer elbow pain. They searched databases like CENTRAL, MEDLINE, and Embase until January 31, 2024, without restrictions on language or publication date. The study found that there is low-certainty evidence suggesting manual therapy may offer some benefits in reducing pain and disability at the end of treatment.[1]

Another study by Reyhan AC et al. (2020) examined the effects of Mulligan's mobilization with movement (MWM) technique on patients with lateral epicondylitis, particularly focusing on elbow pain, functional ability, and pain-free grip strength. Forty patients were included and split into two groups: one received MWM, exercise, and cold therapy, while the other received only exercise and cold therapy. The treatment sessions occurred five times a week for two weeks, and various measures were taken at the start, after treatment, and at one and three months follow-ups. The study showed MWMplusexerciseandcoldtherapyisasafeandeffectivealternativewithpositiveeffectsonelbowpain,Functional capacity, and pain-free, maximum grip strength. [2]

In additionHoglet P et al. (2013) assessed the effectiveness of exercise therapy and mobilization methods for both medial and lateral epicondylitis. They searched databases like PubMed, Embase, Cinahl, and Pedro for relevant clinical trials and systematic reviews. Moderate evidence was found supporting the short-term effectiveness of stretching and strengthening exercises compared to ultrasound and friction massage.[3]

AlsoSharmila S (2023) compared the effectiveness of Active Release Technique (ART) and Oscillating Energy Manual Therapy (OEMT) reducing pain, improving grip strength, and functional ability in chronic lateral epicondylitis. Forty patients aged 25 to 45 were randomly divided into two groups: Group A received ART, while Group B received OEMT. The results indicated that both treatments were effective, but ART was more effective in improving grip strength and reducing pain and disability compared to OEMT.[4]

Day JM et al. (2021) compared local therapy (LT) alone to LT combined with scapular muscle-strengthening (LT + SMS) for patients with lateral elbow tendinopathy. Both groups received education, a forearm brace, therapeutic exercises, manual therapy, and thermal treatments as needed, with the LT + SMS group also doing muscle-strengthening exercises. This pilot study found that both treatment methods were similarly effective in reducing pain, improving function, and increasing grip strength.[5]

Marc-André Blanchette MA et al. (2011) evaluated the impact of augmented soft tissue mobilization (ASTM) on treating lateral epicondylitis. They included 27 subjects (12 men and 15 women) and randomly assigned them to two groups. The experimental group received ASTM twice a week for five weeks, while the control group received advice on natural progression of the condition, computer ergonomics, and stretching exercises. Both groups saw improvements in grip strength without pain.[6]

Day JM et al. (2021) compared local therapy (LT) treatment to LT plus a scapular muscle-strengthening program. Both groups underwent education, a forearm brace, therapeutic exercises, manual therapy, and thermal treatments. The results indicated that both methods were equally effective in reducing pain and enhancing function. [7] Yi R et al. (2017) investigated deep friction massage's effectiveness for lateral epicondylitis through a randomized trial among patients. They were assigned to one of three treatments: splinting and stretching, a cortisone injection, or a lidocaine injection with deep friction massage. Significant improvements in pain scores were noted across all treatment groups. The cortisone and deep friction massage groups showed better improvements in disability scores and grip strength compared to the splinting group.[8]

Bisset L et al. (2005) conducted a systematic review of physical interventions for lateral epicondylalgia, identifying 76 randomized controlled trials, with 28 meeting the criteria for meta-analysis. They found that extracorporeal shock wave therapy did not help in treating tennis elbow. [9]Viswas R et al. (2012) compared the effectiveness of a supervised exercise program to Cyriax physiotherapy in treating tennis elbow with 20 patients. Group A received the supervised exercise program, while Group B underwent Cyriax physiotherapy, with each group receiving three sessions weekly for four weeks. The results suggested that the supervised exercise program may be the preferred initial treatment for therapists managing tennis elbow.[10]

Basson A et al. (2017) aimed to assess the effectiveness of neural mobilization for musculoskeletal issues with a nerve-related component. They included 40 studies, and 17 had a low risk of bias. Meta-analysis was only possible on self-reported outcomes, showing benefits of neural mobilization for back and neck pain, but effectiveness for other conditions remains unclear. [11] Bisset L et al. (2011) aimed to ascertain the effects of

treatments for tennis elbow, searching multiple databases up to November 2009 and finding 80 relevant studies. A GRADE evaluation was performed on the evidence quality for interventions.[12]Landesa-Piñeiro L et al. (2022) sought to determine the effectiveness of physiotherapy for epicondylitis and identify the best techniques, conducting a systematic search in various databases in October 2020. Nineteen articles were found, covering methods such as shock wave therapy, orthoses, manual therapy techniques, bandaging, therapeutic exercise, and other modalities. The reviews indicated various treatment approaches for managing lateral epicondylitis.[13]
Thomas E et al 2019 (27)this review is to determine the efficacy of muscle energy techniques (MET) in symptomatic andasymptomatic subjects.26 studies were considered eligible and included in the quantitative synthesis: 14 regarding
symptomatic patients and 12 regarding asymptomatic subjects.MET are an effective treatment for reducing chroniclateral epicondylitis. MET can be applied to increase range of motionof a joint when a functional limitation is present.

Overview of the evidence
Cyriax Physiotherapy: This technique involves deep transverse friction massage aimed at breaking down adhesions and promoting healing in the affected tendons. Studies suggest that Cyriax physiotherapy can be effective in reducing pain and improving function in patients with tennis elbow [34].
Mobilization with Movement: This technique combines passive joint mobilization with active movement. It has shown promising results in improving pain-free grip strength and overall function. Evidence indicates that this method can provide immediate pain relief and enhance joint mobility[7].

Fig. 2. During saline-induced pain, subjects received either a mobilization-with-movement (A), or a placebo (B) intervention. The white arrows in photograph A indicate the lateral glide force applied to the proximal ulna (1), and the stabilizing counter-force on the lateral aspect of the distal humerus (2). The technique was sustained while the subject maintained an isometric gripping action (3). The placebo condition (B), involved the application of light manual contact to the medial and lateral aspects of the subject's elbow joint while the subject maintained a relaxed grip. For both conditions the contact was sustained for 30 s, with a 30 s interval of rest. Three bouts of each intervention were applied.

Oscillating Energy Manual Therapy (OEMT): referred to as 'V-spread', OEMT involves gentle oscillating impulses applied to tender points. Research indicates that this technique can reduce pain and improve functional outcomes in patients with lateral epicondylitis [7].

GROUP II- OSCILLATING ENERGY MANUAL THERAPY (OEMT)

Oscillating energy manual therapy (OEMT) referred as 'V-spread', is a standard method described in many osteopathic books.
In this group, subjects were made to sit on the chair with the affected arm resting on the table.
Tender points were palpated, and the therapist places index and middle finger of one hand in a V-shape over the tender points and places index finger of other hand over the medial sides of elbow, diagonally across the located tender points.

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Fig-3: OEMT

Gentle pressure applied few times using fingertips to the tissues alternatively from medial and lateral sides to start the oscillations. At this point of initiation of oscillations, the application of pressure should be stopped and allowing the oscillations to continue between the two points of contact on the subject elbow.
This technique was repeated few times, until when the treated tender point was not tender on palpation and it should be repeated for all the tender points with duration of 20-30minutes over

Eccentric and Concentric Exercises: While not strictly manual therapy, specific strengthening exercises included in a rehabilitation program can enhance the effectiveness of manual techniques. Eccentric exercises, in particular, have been associated with reduced pain and improved function [38].

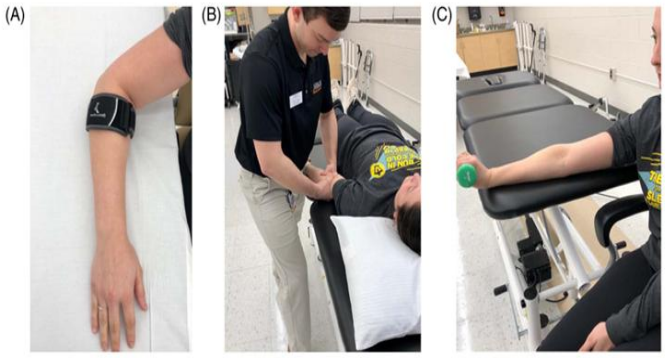

Figure 2 — Examples of multimodal treatments for both groups. (A) Counterforce bracing. Participant instructed to wear during work and sports activities as needed. (B) Mobilization with movement. Therapist provided lateral glide of elbow with participant performing pain-free grip. (C) Eccentric wrist extensor exercise. Participant instructed to lower weight against resistance with the elbow in an extended position.

Evidence of Effectiveness

Numerous studies have focused on the efficacy of manual therapy in treating tennis elbow. A systematic review highlighted that manual therapy, when combined with exercise, can lead to significant improvements in pain and functional status compared to no treatment or less active interventions [13],[14].

1-Pain Modulation: Manual therapy techniques, such as mobilization and manipulation, are believed to modulate pain through various neurophysiological mechanisms. This includes the activation of descending pain control pathways that can inhibit pain signals at the spinal cord level. Manipulative techniques may lead to an immediate hypoalgesia effect, reducing pain perception in patients with tennis elbow 9.

2-Tissue Healing: Manual therapy can enhance tissue healing by improving blood flow to the affected area. This increased vascularization can facilitate the delivery of necessary nutrients and oxygen to the injured tissues, aiding in recovery. Techniques like deep friction massage are thought to promote the resolution of inflammation and the reorganization of collagen fibers in the tendon 9.

3-Biomechanical Changes: Manual therapy can lead to biomechanical changes that improve the function of the affected joint. By restoring normal joint mechanics, these interventions can help alleviate stress on the extensor tendons, reducing the likelihood of the further injury. For instance, mobilization techniques may improve range of motion and reduce stiffness in the elbow joint, which can contribute to better functional outcomes

4-Functional Improvement: The integration of manual therapy with exercise regimens has been shown to enhance grip strength and overall elbow function. A randomized controlled trial indicated that patients who engaged in manual therapy alongside a structured exercise program experienced greater functional improvements than those who did not.

Long-term Outcomes: manual therapy can provide short-term benefits,questions remain about its long-term efficacy. Some studies suggest that the benefits may not be sustained over time, highlighting the need for ongoing management strategies[30][31].

Limitations of the Evidence

the overall quality of the evidence varies, with many studies having small sample sizes and methodological limitations.

Small Sample Sizes: Many studies had small sample sizes, which reduces the statistical power of the results and increases the risk of Type I and Type II errors. A small sample size can limit the generalizability of the findings, making it difficult to draw firm conclusions about the effectiveness of the interventions. For instance, if a study includes only a handful of participants, the results may not reflect the true effects of the treatment in a broader population. A reference from the text indicates that post hoc analyses revealed the need for larger sample sizes to adequately assess the treatment effects, specifically mentioning the need for at least 34 participants in some trials 27.

Short Follow-Up Periods: Many studies reported outcomes only shortly after the intervention, often within a few weeks. This short follow-up period is problematic because it fails to capture the long-term effectiveness and durability of the treatment effects. In clinical practice, the sustainability of pain relief or functional improvement is critical for determining the value of an intervention. There is a noted lack of studies that monitor outcomes over extended periods, which limits the understanding of how effective these treatments are in the long run.

Lack of Blinding: The absence of blinding in many studies raises concerns about performance and detection bias. Without blinding, both participants and health care providers may have preconceived notions about the effectiveness of the treatment, which can influence the outcomes reported. For example, in trials where participants are aware of the treatment they are receiving, their expectations can significantly affect their self-reported outcomes, such as pain levels and treatment satisfaction 23. This limitation was highlighted in the text, noting that many trials were susceptible to performance and detection biases due to the lack of blinding 23.
Biases Due to Non-Randomized Designs: Several studies employed quasi-randomized designs or had issues with randomization and allocation concealment. This lack of rigorous randomization can lead to systematic differences between groups that confound the results. For instance, if participants with more severe symptoms are preferentially allocated to one treatment group, this could skew the effectiveness results in favor of that group 31.
High Attrition Rates: Some studies reported significant participant drop-out rates, which can bias the results if the reasons for dropping out are related to treatment efficacy or adverse events. High attrition compromises the integrity of the study data, as it may indicate that the treatment was not acceptable for some participants, thereby affecting the overall treatment results 29.
Inadequate Reporting of Outcomes: Many studies failed to report important outcomes consistently, such as adverse events or dropout reasons. This inadequate reporting can obscure the safety and effectiveness profiles of the interventions being studied

CONCLUSION

Manual therapy plays theimportant role in the management of tennis elbow whenthe pain and functional deficits associated with the condition. Techniques such as Cyriax physiotherapy, mobilization with movement, and targeted exercise programs are effective in promoting recovery.

Clinical Implications

Clinicians should consider incorporating manual therapy into comprehensive treatment plans for patients with lateral epicondylitis, along patient-centered approaches and continuous rehabilitation.

Future research directions

further high-quality research is needed to establish standardized protocols and long-term effectiveness.

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