An Investigation Comparing the effects of Muscle Energy Techniques and Myofascial Release on Discomfort and Functional Ability in Patients with Lateral Epicondylitis - A Pilot Study

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Abstract:
In patients with lateral epicondylitis (tennis elbow), this study compares the benefits of muscle energy techniques (MET) and myofascial release (MFR) on pain and functional performance. A common overuse ailment that affects the forearm's extensor tendons and causes severe discomfort and functional restrictions is called lateral epicondylitis. Fifty volunteers, aged between twenty and forty, were split equally into two groups for the study: Group B received MFR and Group A received MET. There was a 4-week intervention for both groups. The Numerical Pain Rating Scale (NPRS) and the Patient-Rated Tennis Elbow Evaluation (PRTEE) were employed to measure pain and functional performance, respectively. The outcomes showed that both groups' post-intervention functional performance had significantly improved and there had been a considerable decrease in discomfort. Group A had an improvement in PRTEE from 65.33±4.72 to 33.17±4.46, and a mean decrease in NPRS pain from 6.67±0.97 to 3.87±0.83. Group B had an improvement in PRTEE from 66.83±3.66 to 31.20±4.57 and a mean reduction in NPRS pain from 6.20±0.94 to 3.17±0.85. MFR was found to be more effective than MET through comparative study, with Group B demonstrating noticeably higher results in terms of pain reduction and functional performance. In summary, patients with lateral epicondylitis can effectively manage their pain and improve their function with both MFR and MET, but MFR shows higher efficacy in these areas. To validate these results, other studies with bigger sample sizes and longer follow-up times are advised.

Keywords: Myofascial release, Muscle energy technique, lateral epicondylitis, elbow pain, functional Performance.

Introduction:
In the kinematics of any activity requiring upper extremity function, the elbow plays a role. Just as any other joint, the elbow's stability comes from a combination of instantaneous restraint from ligament integrity and bone shape, as well as dynamic constraint from stretched muscles. The primary functions of the ulnar humeral joint are flexion and extension in a hinge or uniaxial fashion; however, normal axial and angular changes can also occur. The syndrome of persistent, debilitating elbow pain, mainly in the radio humeral joint, is referred to
as tennis elbow, lateral epicondylitis, or lateral epicondylalgia. Runge originally described lateral epicondylitis in 1873[2]. The wrist extensor tendons' degeneration was characterised as a chronic symptomatic degeneration that included their affixation to the humerus's lateral epicondyly. Based on the tissues involved and how they started, tendon injuries can be categorised into multiple groups. Multiple micro traumatic events that damage the internal structures of the tendon and degenerate the cells and matrix prevent the tendon from maturing into a normal tendon are the cause of chronic overuse injuries. Occasionally, these injuries lead to tendinosis. Extensor carpi radialis brevis (ECRB) is the wrist extensor that is most afflicted, however other wrist extensors such extensor carpi radialis longus, extensor digitorum, extensor digiti minimi, and extensor carpi ulnaris may also be impacted. Activities like manual work, playing an instrument, tennis, or typing that involve the overuse and repetition of these muscles can lead to tendinosis. The age group between 35 and 55 years old has the highest frequency of lateral epicondylitis, with a prevalence rate of 1-3%. The condition can develop gradually or suddenly [6]. The main goals of lateral epicondylitis therapy are muscular training, pain alleviation, and movement preservation. The most common treatments are bracing against force, ice, nonsteroidal anti-inflammatory drugs, corticosteroid injections, stretching, strengthening exercises, iontophoresis, acupuncture, and ergonomic modifications or training.

Extensor muscles that traverse the posterior portion of the joint comprise the other two muscles. The proximal and distal radioulnar joints function as a single joint due to their connection. The forearm rotates when the two joints work together, and they have one degree of motion. The rotation (supination and pronation) that takes place in the transverse plane along a longitudinal axis is made possible by the radioulnar joints, which are arthrodial uniaxial joints of the pivot (trochoid) type. These joints are connected to four muscles and six ligaments. There are two muscles used for pronation and two for supination. Despite being separate articulations, the proximal radioulnar joint and the elbow joint are contained within a single joint capsule.

**Muscle Energy Technique:**

An approach of soft tissue release used to address a range of musculoskeletal issues is muscle energy methods, or METs. The main goals of MET are to increase the range of motion in a restricted joint and lengthen a shortened or muscle. In MET, the patient voluntarily contracts the impacted joints or muscles in opposition to the operator's counterforce. During the procedure, the injured muscle is gradually stretched to its furthest pain-free range. Submaximal muscle contractions, lasting approximately five seconds each, are then performed by the patient three to five times. As a result, the range of motion is enhanced and the muscle is encouraged to spontaneously relax.

**Myofascial Release Therapy:**

The goal of myofascial release treatment (MFR) is to restore appropriate length, reduce discomfort, and enhance function by applying a low load, long duration stretches to the myofascial complex [11]. To relieve pain, improve range of motion, and balance the body, myofascial release, or MFR, is a manual massage method that involves stretching the fascia and releasing ties between it and the muscles, bones, and integuments. Through direct or indirect manipulation of the fascia, the fibres of the connective tissue can
realign themselves in a way that is more flexible and useful. Myofascial release is used to remove constraints or limitations that are in the deeper levels of fascia. This is achieved by altering the viscosity of the fascia's ground substance and extending the muscle elastic component and crosslink of the fascia.

**Justification of Doing Research:**
The chronic overuse injury known as lateral epicondylitis frequently affects the common origin of the wrist extensors' tendon. Pain and dysfunction result from this, making daily life activities difficult. Many traditional methods and therapies have been utilised to treat lateral epicondylitis to reduce symptoms. However, experiments comparing different approaches have not yet been conducted. Furthermore, there is a paucity of research supporting which of these two procedures is superior for treating laterally placed epicondylitis. The purpose of this research is to determine how well myofascial release therapy and muscular energy technology affect patients’ discomfort and functional ability in cases of lateral epicondylitis.

**Materials and Method:**

**Study Design**
Experimental study design

**Sampling**
Convenient Random Sampling

**Research Area**
Prakash Institute of Physiotherapy, Rehabilitation and Allied Medical Sciences
Fortis Memorial Research Institute, Gurugram

**Home Visits**

**Sampling Method and Grouping**
Total 30 subjects were recruited
Group A-15 (MET)
Group B-15 (MFR)

**Criteria for Sampling Collection:**

**Inclusion criteria**
Age between 20-40 years
Both genders will be considered
Patients having Unilateral elbow pain >3 months (chronic elbow pain)
Patients having positive test results for Cozens, Mills or Maudsley test
Ready to take part in research

**Exclusion criteria**
Patients having any past trauma or surgery of upper limb in past 3 months
Patients suffering from any known Malignancies
Elbow recently affected by steroid infiltration
Soft tissue ossification and calcification (upper limb)
Acute infection
Neurological impairment
Soft tissue injury around elbow
Peripheral nerve injury at elbow
Any pathological change/disease around elbow

Variables
Independent variables
Myofascial release technique
Muscle energy technique

Dependent variables
Pain (NPRS)
Functional performance (PRTEE)

Procedure:
The subjects in the study were admitted based on the inclusion and exclusion criteria. Before beginning the therapy intervention, the patients were given a detailed explanation of the technique and asked to sign consent forms. Based on the results of these particular tests, patients were enrolled. Cozens test: The examiner places their thumb on the patient's lateral epicondyle to stabilise the patient's elbow. Next, the patient is instructed to clench their fist, stretch their wrist radially, pronate their forearm, and oppose the examiner's movements. A sharp, excruciating pain in the humeral epicondyle is a good indicator. One can palpate the epicondyle to determine the source of pain. Mill’s test: The examiner expands the elbow, fully flexes the wrist, and passively pronates the patient's forearm while palpating the lateral epicondyle. A lateral epicondyle of the humerus is painful, which indicates a positive test. The radial nerve is also stressed by this manoeuvre, and when the radial nerve is compressed, the resulting symptoms closely resemble those of tennis elbow. Using randomised sample procedures, the enrolled patients were divided into two groups, Group A and Group B. Group A Received Muscle energy technique: The patient is seated at a significant height. The subject's forearm was supinated with the operator's other hand while the patient's humerus was stabilised distally with one hand, until resistance or discomfort was felt. For five seconds, the patient pronated his or her forearm (an isometric contraction of the common extensors, namely the extensor carpi radialis longus, extensor carpi radialis brevis, and extensor digitorum) against resistance while maintaining the position. This was followed by a brief increase in supination until the resistance was met once more. In a single treatment session, the process was carried out five times following 5-second relaxation intervals. For four weeks, this method was used three times a week. Group B received Myofascial release technique: The subjects were lying supine, with their elbows bent to a 15° angle and pronated, and their palms flat on the treatment table. The affected side of their shoulders was rotated internally. Therapist faces the ipsilateral hand while standing at the edge of the table close to the shoulder.
Step 1: Exactly proximal to the lateral epicondyle on the humerus, treatment was started from the common extensor tendon (CET) to the extensor retinaculum (ER) of the wrist. Engage the periosteum with your fingertips, then carry this contact inferior to the common extensor tendon and finally down to the wrist’s extensor retinaculum (5 minutes, twice). After that, throughout this process, the patient gradually flexes and extends their elbow between 5° and 10°.

Step 2: Applying treatment to the ulna’s periosteum involves rubbing the area with your hands for two minutes. After that, the patient alternated between radial and ulnar wrist deviations.

Step 3: Radius spreads from the ulna, contacting the dorsal tubercle of the radius with the pads of one hand and the head of the ulna with the pads of the other. The therapist applied force in a lateral and distal manner, engaging all the way to the periosteum. With the clear intention of spreading the bones, it is carried for only a few centimetres (5min, 2repetitions). Dosage: Three 30-minute sessions per week for four weeks.

Initial measurements of the outcome measures were made on day one (pre-intervention), and the last reading was obtained four weeks later (post-intervention).

Result:
Thirty volunteers in the age range of 20–40 years old, both male and female, took part in the study. In group A, there were 11 males and 4 females, with a mean age of 32.77±4.22. In group B, there were 12 males and 3 females, with a mean age of 35.15±3.33. Paired T test was performed to compare the pre and post intervention findings in each group. Unpaired T test was performed to compare the findings between group A and group B.

Overview of the Findings:
Within the group analysis for Group A
The NPRS for pain was assessed both before and after group A’s intervention. There were two mean values: 3.87±0.83 and 6.67±0.97. Significant statistical differences were found between the pre and post intervention periods (t=19.34).

Pre-and post-intervention PRTEE functional performance tests were conducted on group A. The averages were 33.17±4.46 and 65.33±4.72. Significant statistical differences were seen between the pre and post intervention periods (t=50.02).

Within the group analysis for Group B
Group B underwent pre-and post-intervention NPRS for pain testing. The averages were 3.17±0.85 and 6.20±0.94. Significant statistical differences were found between the pre and post intervention periods (t=22.75).

Pre- and post-intervention PRTEE functional performance tests were conducted on group A. The average values were 31.20±4.57 and 66.83±3.66. Significant statistical differences were found between the pre and post intervention periods (t=57.11).

Comparison of the findings of group A and group B: After group A’s intervention, the mean NPRS score for pain was 3.87±0.83, while group B’s post-intervention mean score was 3.17±0.85. The outcome revealed a statistically significant difference between MFR and MET after the intervention. Following the intervention,
the mean PRTEE value for pain in group A was 33.17±4.46, while the mean PRTEE value for pain in group B was 31.20±4.57. The outcome revealed a statistically significant difference between MFR and MET after the intervention.

**Conclusion:**

During the session, both groups experienced significant pain relief. Analysing the mean NPRS values within each group revealed a statistically significant difference. Nevertheless, a statistically significant difference in average pain reduction of 3.87±0.83 on MET and 3.17±0.85 on MFR was found when comparing the groups. When compared to Group A, Group B's pain decreased more than Group A’s. The application of MFR and MET in the current study resulted in an improvement in functional performance as measured by PRTEE, which is consistent with findings from earlier studies that found both approaches improved functional status. The current study's findings imply that both the muscle energy technique and the myofascial release technique are useful for lowering pain and enhancing functional performance. However, after four weeks of MFR method, patients show a marked and significant improvement. Thus, it can be said that MFR outperforms MET.

**References:**


Cynthia c norkins: Joint structure and function-a comprehensive analysis (4th ed.). pg273-274


Mark A. Jones, Darren A. Rivett Clinical reasoning for manual therapist .2004;89.


