

To Study the Effectiveness of Cyriax Mill's Manipulation and Deep Transverse Friction Versus Myofascial Release Technique on Pain, Grip Strength and Functional Disability in Subjects with Lateral Epicondylitis: An Experimental Study

Rucha Patel¹, Edrish Saifee Contractor²

¹Assistant Professor, Gokul Physiotherapy College, Near Sujapur Patia, State highway- 41 Sidhpur Gujarat

²Ph.D, MPT (Orthopaedic conditions) Gujarat University, Incharge Principal & Senior Lecturer, Shree Swaminarayan Physiotherapy College, Near G.S.T. Crossing Ranip, Ahmedabad

Corresponding Author: Rucha Sanjaykumar Patel

DOI: <https://doi.org/10.52403/ijhsr.20230503>

ABSTRACT

BACKGROUND: Lateral epicondylitis is one of the common diseases of the elbow joint. Lateral epicondylitis primarily affects the muscles and soft tissues around the elbow joint. Research has found that the extensor muscles, particularly the extensor carpi radialis brevis (ECRB), are involved in vigorous and repetitive movements of the wrist. Various treatments have been identified, from conservative treatment to surgical treatment, cryotherapy to ergonomic advice, but the results are still inconclusive.

OBJECTIVE: The aim of the study is to compare the effectiveness of Cyriax mill's manipulation and deep transverse friction versus the myofascial release technique on pain, grip strength, and functional disability in subjects with lateral epicondylitis.

METHOD: 30 patients with lateral epicondylitis between the age of 30 to 45 years were included in the study according to the inclusion criteria, individuals are divided into 2 groups. Group A which was Cyriax physiotherapy and conventional physiotherapy and Group B which was MFR and conventional physiotherapy. The treatment is given for 4 weeks 3 times a week.

OUT COMES: NPRS (for pain), HHD (for grip strength), PRTEE (for functional disability)

RESULT: After treatment for 4 weeks and 3 times a week, there was a significant improvement in pain, grip strength and functional disability in both groups. But more improvement in group B, which is MFR and conventional treatment.

CONCLUSION: It can be concluded that after 12 treatment sessions, both the Cyriax technique and the myofascial release technique were effective in the treatment of lateral epicondylitis, but the MFR technique was found to be more effective than Cyriax physiotherapy in reducing pain and improving grip strength and function in patients with lateral epicondylitis.

KEY WORDS: Cyriax, MFR technique, Deep transverse friction massage, Tennis elbow, NPRS, Grip strength, PRTEE

INTRODUCTION

Lateral epicondylitis (LE) is a chronic overuse injury that damages the tendon that connects the extensor muscles of the forearm to the humerus, called the common

extensor tendon.⁽¹⁾ Lateral epicondylitis, also known as "tennis elbow", generally affecting the middle-aged population with no gender predisposition. It is the most

common condition in the elbow joint, affecting 1% to 3% of the population. ⁽²⁾

Lateral epicondylitis is a degenerative or non-healing tendon reaction that is characterized by an increased presence of fibroblasts, vascular hyperplasia, and disorganized collagen that is seen at the origin of the extensor carpi radialis brevis (ECRB), which is the most commonly affected structure. ⁽³⁾

Patients complain of pain localized on the anterior and bony surface of the upper half of the lateral epicondyle, pain radiating in accordance with the mass of the common extensor muscles. Pain can vary from intermittent and mild pain to continuous and severe pain that causes sleep disturbances. It is produced by the contraction of the wrist and finger and supinator muscles against resistance.⁽²⁾ It results in difficulty with functional tasks.⁽⁴⁾ This includes difficulty with work performance, daily activities, and leisure activities. Symptoms increase with activities of daily living that involve hand grasping involving holding tools, shaking hands, and lifting a kettle.⁽⁵⁾

This disorder is primarily work-related, the main cause of which is wrist activities that involve extremely fast and monotonous repetitive eccentric contractions and grips. It is generally a big challenge and therefore many subjects can suffer from this condition after a few months of their employment. The dominant arm is commonly affected upper limb in the general population, the prevalence is 1.5% to 3.2% and the incidence increases drastically to 18% between the ages of 30 and 50 and is seen more in women. ⁽⁴⁾

Many treatment options for lateral epicondylitis consist of therapeutic ultrasound, phonophoresis, electrical stimulation, manipulation, soft tissue mobilization, neural tension, friction massage, augmented soft tissue mobilization (ASTM), extracorporeal shock wave therapy, laser therapy, stretching and strengthening exercises ^{(3),(6),(7)} However, there is no general consensus on the most

appropriate treatment strategy for lateral epicondylitis. Bisset et al. 2005, identified evidence for elbow manual therapy and therapeutic exercises.⁽⁸⁾

Cyriax treatment consist of 10-minutes of deep transverse friction massage, and prepare the body tissue for the manipulation, then after single application of Mill's manipulation. Friction massage creates pain relief by modulating pain impulses at the level of the spinal cord. Mill's manipulation causes a lengthening of the scar after manipulation ruptures.⁽⁹⁾ There have been very few studies on Cyriax manipulation because most of them having problem with proper randomization, blinded measurement results, and accurate functional outcome questionnaires^{(10),(11),(12)}. Because of this reasons, further research is required to establish the effectiveness of the Cyriax physiotherapy intervention.

A myofascial release technique that consists of applying a low load, a long duration stretch (120-300s) to the myofascial complex. Myofascial release is generally used with either the direct myofascial release technique or the indirect myofascial release technique. In this study, a direct myofascial release technique, which is given by the fingertips and knuckles, was used. The analgesic effect of myofascial release may also be attributed to stimulation of afferent pathways and excitation of afferent A delta fibers, which may cause segmental pain modulation as well as modulation through activation of descending pain inhibitory systems.⁽¹³⁾ Ajimsh et al. applied MFR to patients who were computer professionals with lateral epicondylitis and reported that the MFR group had better results than the control group.^{(14),(15),(16),(17)} Aim of the study to determine the effect of myofascial release therapy in patients with lateral epicondylitis.

Very few studies comparing the effectiveness of Cyriax mill's manipulation and deep transverse friction versus myofascial release technique on pain, grip strength, and functional disability in

subjects with lateral epicondylitis. Which technique is better for treating lateral epicondylitis. Thus, this study will help the proper treatment plan in choosing joint and soft tissue manipulation for the treatment of lateral epicondylitis. Thus, this study shows the comparative effect of cyriax mill's manipulation and deep transverse friction versus myofascial release technique on pain, grip strength, and functional disability in subjects with lateral epicondylitis.

MATERIALS AND METHODOLOGY

Total of 30 subjects taken into the study. Both males and females in age group of 30 to 45 years suffering from lateral epicondylitis were referred from outpatient department, physiotherapy and rehabilitation centre, Ahmedabad India. Patients were referred by orthopedic consultant, health care providers and also self referral to the centre. All patients with lateral elbow pain were assessed and those who fulfilled the inclusion criteria were selected and assigned to any of the two treatment groups by the simple random sampling. Group A (n=15) were given Cyriax physiotherapy and conventional therapy. Group B (n=15) were given MFR and conventional therapy.

This study was approved by the institutional ethical committee and a written consent was taken from each patient before study. The study was carried for 3 days a week for 4 weeks. Knowledge about the study was given to all the participants. But the participants were blinded about the type of intervention they were being given. The outcome selected in this study was pain, grip strength and functional disability. Pain was evaluated using NPRS, it is having high reliability when compared with other scales for pain assessment. Grip strength was measured using Hand held dynamometer, it is a light weight, hand held and more easy in use and gives more appropriate result and PRTEE is patient rated tennis elbow evaluation scale for functional disability of

elbow. Outcomes were assessed before and after end of 4th weeks of treatment.

INCLUSION CRITERIA:

Either one of the test positive: Cozen test positive, Mill's test positive, Mudsley test positive, Pain with the problems in gripping, Tenderness on palpation over the lateral epicondyle of humerus, Chronic condition.

EXCLUSION CRITERIA:

Cardiovascular disease, Neurological impairments, Aversion to manual contact, Neuromuscular disease, Previous trauma to elbow region, Previous surgery to elbow region, Peripheral nerve entrapment, Cervical radiculopathy, Corticosteroid injection within 6 months, Previous therapy for elbow joint, Active infections, Bursitis, Ossification and calcification of soft tissue, Osteoporosis, Active rheumatic arthritis, Care with fragile skin and patients with anticoagulant treatment, Malignancy.

INTERVENTION:

CONVENTIONAL PHYSIOTHERAPY:

⁽¹³⁾ Patients in both the groups were given conventional physiotherapy in the form of pulse ultrasound therapy, exercise therapy regimen of stretching and strengthening exercises.

Pulse ultrasonic therapy (PUS):⁽¹³⁾

Patient position: Comfortably seated, hand supported by pillow

Application of US: Over tenoperiosteal junction of ECRB

Frequency: 1MHz

Intensity: 1.5 W/cm²

Duration: 1:4 ratios, 5 minutes, 3 session/week for 4 weeks

Stretching: ^{(13),(18)}

Stretching: Self-stretching of wrist extensors

Patient position: Comfortably seated, elbow extended, forearm pronated

Hand placement and procedure: patient ulnarly deviate the wrist and flexes the wrist

and fingers. Then apply a gentle stretch force against the back of the hand

Treatment duration: 15 sec hold, 10 stretches / session/day, 3 times a week for 4 weeks

Strengthening: (13)

Strengthening: Wrist extensor isometric exercise

Patient position: Comfortably seated, elbow 90° flexion, forearm pronated

Hand placement and procedure: Unaffected hand applying manual resistance over dorsum of hand

Treatment duration: 5 to 10 seconds hold, 15 contractions/ session/day for 4 weeks, 3 times a week.

GROUP A: CYRIAX

PHYSIOTHERAPY GROUP : (9)

“Cyriax treatment consist of 10-minutes of deep transverse friction massage, and prepare the body tissue for the manipulation, then after single application of Mill's manipulation.”

Deep transverse friction:



Fig .1 Application of Deep Transverse Friction

Patient position: comfortably seated, elbow fully supinated and in 90° of flexion.

Hand placement and procedure: After palpating the anterolateral aspect of the lateral epicondyle of humerus, location of tenderness. Deep transverse friction is given with the side of the thumb tip. Pressure was applied in a posterior direction to the tenoosseous junction.

Treatment duration: 10 minutes, 3 times a week for 4 weeks (12 sessions)

Mill's manipulation:

Patient position: comfortably in the sitting position with the affected extremity in 90° of abduction with internal rotation enough so that the olecranon faced up

Hand placement: stabilized the patient's wrist in full flexion and pronation with one hand, while the other hand was placed over the olecranon. When assuming full wrist flexion and pronation, the therapist should apply a high-velocity, low-amplitude thrust at the end of the range of elbow extension

Treatment duration: Single application, 3 times a week for 4 weeks (12 sessions)



Fig.2 Application of Mill's Manipulation

GROUP B :MYOFASCIAL RELEASE THERAPY: (13)

Direct technique MFR used in this study.

Patient Position: The subjects were in supine with affected side shoulder rotate internally, elbow flexion to around 15° and pronation, palm resting flat on table.

Procedure 1: Strum release, Treating from common extensor origin to extensor retinaculum (ER) of wrist.

Hand placement and procedure: Began on humerus, just proximal to lateral epicondyle. Using fingertips to engage periosteum and carries this contact inferior to

common extensor tendon and then down to extensor retinaculum of the wrist. Then, the

patient slowly flexes and extends the elbow within range of 5° to 10° during this procedure.

Treatment duration: 5 min 2 repetitions, 3 times a week for 4 weeks.

Procedure 2: Strum release, Treating through periosteum of ulna,

Hand placement and procedure: Use knuckles of hand to work over periosteum of ulna. Then the patients performed alternating ulnar and radial deviation of wrist.

Treatment duration: 5 min 2 repetitions, 3 times a week for 4 weeks.

Procedure 3: Strum release, Spreading radius from ulna

Hand placement and procedure: Contacts head of ulna with finger pads of one hand and dorsal tubercle of radius with the pads of other. The therapist engaged through to the periosteum and put a line of tension in a lateral and distal direction. It is carried for just a few centimeters with a firm intent to spread the bones.

Treatment duration: 5 min 2 repetitions, 3 times a week for 4 weeks.



Fig. 3 Treating from common extensor origin to extensor retinaculum of wrist

Fig. 4 strum release treating through periosteum of ulna

Fig. 5 strum release spreading radius from ulna

Patient in both the groups were advised not to lift heavy weight and not to do any strenuous activity with the affected hand. Patients were not allowed to take other electrotherapeutic modality or any other kind of treatment like taping, laser etc during the intervention period. Post outcome measure in the form of NPRS, PRTEE score and Hand Held Dynamometer were taken after completion of treatment (after 4th week).

STATISTICAL ANALYSIS

All statistical analysis for the subjects in both the groups was done using SPSS 28 and Microsoft excel 2019. Level of

significance was at 5% with the confidence interval 95%. Data was not normally distributed for all the outcome measures. So, Non Parametric tests were applied for within group and between group analysis. Data analysis was done after 4 weeks of intervention. Wilcoxon signed rank test applied to analyse pre and post outcome measure within group, while between group analyses was done using Mann Whitney U test for all outcome measures.

RESULT

COMPARISON OF BASELINE CHARACTERISTICS BETWEEN GROUPS:

Mann Whitney U test was applied to compare the baseline characteristics of the patients in both the groups.

Table 1: Comparison of baseline characteristics between groups.

CHARACTERISTICS	U VALUE	P VALUE
AGE	105	0.754
PRE-NPRS	99	0.570
PRE-HHD	105	0.769
PRE-PRTEE	90	0.350

No statistically significant difference was found between both the groups.

GENDER DISTRIBUTION IN BOTH THE GROUPS:

Table:2 Gender distribution in both the groups.

GENDER	GROUP A	GROUP B	TOTAL
NO. OF MALES	6	7	13
NO. OF FEMALES	9	8	17

MEAN AGE OF PATIENTS:

Table :3 Mean age of patients in years.

GROUP	MEAN AGE (IN YEARS)±SD
GROUP A	39.93 ± 4.16
GROUP B	39.06 ± 5.18

There was no statistically significant difference in mean age of patients in both the groups.

NPRS SCORE WITHIN GROUPS:

Wilcoxon signed rank test was applied to compare pre and post NPRS score in both the groups. Within group analysis showed statistically significant difference in NPRS score ($p < 0.05$).

Table 4: Pre and Post of NPRS score within groups.

	PRE	POST	Z VALUE	P VALUE
	MEAN±SD	MEAN±SD		
GROUP A	6.73±1.66	2.2±0.86	-3.431	0.001
GROUP B	7.13±1.72	1.2±0.67	-3.426	0.001

HHD SCORE WITHIN GROUPS:

Wilcoxon signed rank test was applied to compare pre and post HHD score in both the groups. Within group analysis showed statistically significant difference in HHD score ($p < 0.05$).

Table 5: Pre and Post Mean of HHD score within groups.

	PRE	POST	Z VALUE	P VALUE
	MEAN±SD	MEAN±SD		
GROUP A	8.53±1.55	14.03±2.55	-3.416	0.001
GROUP B	8.56±1.89	19.46±2.19	-3.419	0.001

PRTEE SCORE WITHIN GROUPS:

Wilcoxon signed rank test was applied to compare pre and post PRTEE score in both the groups.

Within group analysis showed statistically significant difference in PRT E ($p < 0.05$).

Table 6: Pre and Post Mean of PRTEE score within groups.

	PRE	POST	Z VALUE	P VALUE
	MEAN±SD	MEAN±SD		
GROUP A	58.66±13.46	13.46±4.01	-3.411	0.001
GROUP B	63.33±11.79	7.73±2.57	-3.409	0.001

NPRS SCORE BETWEEN GROUPS:

Mann Whitney U test applied to compare the difference of NPRS score between two groups. There was statistically significant difference found while comparing both the groups ($p < 0.05$).

Table 7. Comparison of difference of Mean of NPRS score between groups.

OUTCOME MEASURE	GROUP A (MEAN±SD)	GROUP B (MEAN±SD)	U VALUE	P VALUE
DIFFERENCE NPRS SCORE	4.53±1.18	5.93±1.27	51.00	0.009

HHD SCORE BETWEEN GROUPS:

Mann Whitney U test applied to compare the difference of HHD score between two groups. There was statistically significant difference found while comparing both the groups ($p < 0.05$).

Table 8. Comparison of difference of Mean of HHD score between groups.

OUTCOME MEASURE	GROUP A (MEAN±SD)	GROUP B (MEAN±SD)	U VALUE	P VALUE
DIFFERENCE HHD SCORE	5.5±2.99	10.9±1.46	18.00	0.001

PRTEE SCORE BETWEEN GROUPS:

Mann Whitney U test applied to compare the difference of PRTEE score between two groups. There was statistically significant difference found while comparing both the groups ($p < 0.05$).

Table 9: Comparison of difference of Mean of PRTEE score between groups.

OUTCOME MEASURE	GROUP (MEAN±SD)	AGROUP (MEAN±SD)	BU VALUE	P VALUE
DIFFERENCE PRTEE SCORE	45.2±9.60	55.6±10.42	56.00	0.019

Thus from the results of the present study, both the groups shows significant improvement on pain, grip strength and functional disability in subjects with lateral epicondylitis. But Group B (Myofascial release technique + conventional treatment) shows greater improvement than the Group A (Cyriax technique + conventional treatment).

DISCUSSION

The present study was conducted to compare the effect of cyriax technique and myofascial release technique in patients with lateral epicondylitis. Data was analyzed of total 30 subjects. Group A (n=15 patients) was treated with cyriax technique along with conventional physiotherapy and Group B treated with myofascial release technique along with conventional physiotherapy (n=15 patients) for 4 weeks. All the patients completed the intervention and there were no side effects found during study duration. All outcome measures were taken before and after the completion of the treatment of 4 weeks. Both the groups received conventional treatment including pulse ultrasound therapy, stretching and strengthening exercises.

Stretching minimizes the internal strain to the tendon by optimizing tissue extensibility during stress activity. Strengthening and stretching both are the main component of exercise programs, because tendons must have flexibility along with the strength. Lengthening of tendon unit by stretching and strengthening exercises.⁽³⁾ Pulse ultrasound is produce micro massage, cavitation and acoustic streaming. These effects increase vascularity at treatment site and enhanced proliferation of fibroblasts. The reparative process is enhanced by acoustic streaming and cavitation by

increase diffusion of ions and metabolic across the cell membrane. Change in calcium permeability enhances the tissue healing and increase permeability of sodium may reduce the pain and spasm by altering neural activity.⁽¹⁹⁾

Effect of Cyriax physiotherapy on pain:

There was statistically significant improvement found in NPRS score in the group treated with cyriax technique. The mechanism behind reduction of pain was: Mill's manipulation causes the scar to elongate after the rupture of adhesions due to the manipulation. This increased length reduce tension on the scar leading to reduction of pain, and effectively converting a tear shaped like a "V" into one resembling a "U"⁽²⁰⁾ The remaining gap is filled with fibrous tissue resulting in permanent lengthening and pain reduction^{(17),(21)}The application of friction massage induces analgesia and softening of scar prior to the manipulation⁽¹⁷⁾ pain relief produce by the friction massage due to modulation of nociceptive impulses at the spinal cord level, which is known as the gait control theory.⁽²²⁾

Similar findings found in the study done by Goyal et al (2013) who compared the effect of cyriax physiotherapy training and wrist manipulation over a period of 3 weeks. In 30 patients with lateral epicondylitis.⁽²³⁾

Effect of cyriax physiotherapy on grip strength:

There was statistically significant improvement found in HHD score in the group treated with cyriax technique. Similar results were found in study conducted by Amit V. Nagrale et al. conducted a research of cyriax physiotherapy versus phonophoresis with supervised exercise in subjects with lateral epicondylalgia: A Randomized clinical trial involving 60 subjects. VAS , HHD and TEFS were taken to measure pain, grip strength and functional measurement.⁽⁵⁾

Effect of cyriax physiotherapy on functional disability:

There was statistically significant improvement found in PRTEE score in the group treated with cyriax technique. Similar findings found in the study done by ashish prabhakar et al (2013) who conducted a study to see the effectiveness of cyriax physiotherapy in subjects with tennis elbow over a period of 1 week and demonstrated the effectiveness of cyriax technique.⁽²⁴⁾

Effect of MFR technique on pain:

There was statistically significant improvement found in NPRS score in the group treated with Myofascial release technique. The mechanism behind reduction of pain was: It is possible that treatment with MFR after LE may result in a halt in the degenerative process of the tendons at the lateral epicondyle by facilitating the healing process and return of the tendon architecture to normal. it is also possible that pain relief from MFR is secondary to fascial tissue returning to its normative length by collagen reorganization; this is a hypothesis that merits investigation. As with any massotherapy techniques, the analgesics effect of MFR can produce the stimulation of afferent pathways and the excitation of afferent A delta fibers, which can cause segmental pain modulation as well as modulation through the activation of descending pain inhibiting systems.⁽²⁵⁾

Similar results were found in the study done by Ratan Khuman et al (2013) who conducted a study to see the effectiveness of myofascial release technique in chronic lateral epicondylitis: A randomized controlled study on 30 subjects for 4 weeks. Age group was 30 to 45 years. NPRS, HHD and PRTEE were taken for pain, grip strength and function measurement.⁽¹³⁾

Effect of MFR technique on grip strength:

There was statistically significant improvement found in HHD score in the group treated with Myofascial release

technique. The mechanism behind improvement in HHD score was: When pain reduces there will be reduction of the muscle tightness and the muscles were relaxed and produce good amount of contraction.⁽²⁶⁾

Similar results was found in the study done by Dr. Shrikrishna G. Shinde et al (2019) who conducted a study on movement versus myofascial release therapy on pain, and grip strength in patients with lateral epicondylitis over a period of 2 weeks. 20 subjects included into the study. VAS and HHD were taken for pain and grip strength.⁽²⁷⁾

Effect of MFR technique on functional disability:

There was statistically significant improvement found in PRTEE score in the group treated with Myofascial release technique. The mechanism behind improvement in PRTEE score was: secondary to returning the fascial tissue to its normative length by collagen reorganization⁽²⁵⁾ which improves the tensile strength of the muscle and thereby reducing the pain, improving grip strength and functional performance as the fascia returns to the normal length.⁽²⁸⁾

Similar result was found in the study done by M S. Ajimsha et al (2012) who conducted a study to see effectiveness of myofascial release in the management of lateral epicondylitis in computer professionals. with period of 4 weeks. 65 subjects included into the study. Main outcome measure was PRTEE for functional status.⁽²⁵⁾

Compare the effect of Cyriax physiotherapy versus Myofascial release technique on pain

There was statistically significant improvement found in NPRS score in both the groups. But MFR group (B) shows greater improvement in NPRS score compare to the Cyriax group (A). The reason behind more reduction of pain in MFR group (B) was: Many theories have

been suggested including the Gate Control Theory, interpersonal attention, parasympathetic response of the autonomic nervous system, and the release of serotonin. The Gate Control theory suggests that sensory stimuli, such as pressure, travel along faster pathways in the nervous system than pain stimuli. The faster moving pressure stimuli disturb the transmission of painful stimuli to the brain, thereby "closing the gate" to the brain's perception of pain. Interpersonal attention refers to the hands-on, individualized attention that the recipient of massage receives. This personal attention and human touch often have a calming effect that decreases the perception of pain. This relates to the parasympathetic response of the autonomic nervous system. The stimulation of a parasympathetic response reduces the release of stress hormones, anxiety, depression, and pain. The release of serotonin blocks the transmission of harmful stimuli to the brain. Other inhibitory neurotransmitters, such as endorphins, can be released by the pressure that is generated by the treatment. MFR's ability to alleviate pain may relieve muscle spasm, which can be attributed to the application of direct pressure as well. MFR helped in breaking adhesions, increasing blood flow and lymphatic drainage helped to increase soft tissue extensibility which improved muscle strength.⁽²⁹⁾

In Cyriax technique, Mill's manipulation produce the lengthening of scar tissue by the rupture of adhesions due to the manipulation. This increased length reduces tension in the scar, resulting in less pain, effectively converting V shape tear to U tear.⁽²⁰⁾ The resulting gap is filled with fibrous tissue, resulting in permanent lengthening and pain relief^{(17),(21)} The application of friction massage has been reported to provide analgesia to patient prior to the manipulation and also to soften the scar⁽¹⁷⁾ It has been hypothesized that friction massage may be secondary mechanism of pain relief. To the modulation of nociceptive impulses at the spinal cord

level, also known as the gait control theory.⁽²²⁾

In additional, MFR after LE may facilitating the healing process and the return of the tendon architecture to normal. It is also possible that pain relief from MFR is secondary to the fascial tissue returning to its normative length through collagen reorganization⁽²⁵⁾ So, MFR group (B) more reducing pain compare to Cyriax group (A). Similar findings found in the study done by Parth Trivedi et al (2014) who compared the effect of active release technique and myofascial release technique on pain, grip strength and functional performance in patients with chronic lateral epicondylitis over a period of 4 weeks. 36 patients with lateral epicondylitis included into the study. NPRS, HHD and PRTEE were taken for pain, grip strength and functional performance.⁽³⁰⁾

Compare the effect of Cyriax physiotherapy versus Myofascial release technique on Grip strength

There was statistically significant improvement found in HHD score in both the groups. But MFR group (B) shows greater improvement in HHD score compare to the Cyriax group (A). The reason behind more improvement in grip strength in MFR group (B) was: More pain reduction in MFR group compare to Cyriax group. When pain reduces there will be reduction of the muscle tightness and the muscles were relaxed and produce good amount of contraction.⁽²⁶⁾ So, MFR group (B) shows greater improvement in grip strength compare to Cyriax group (A).

Similar findings found in the study done by Arun Balasubramaniam et al. (2016) who conducted a study on effect of myofascial release therapy and active stretching on pain, and grip strength in patients with lateral epicondylitis over a period of 8 weeks. 42 individuals with lateral epicondylitis included into the study. VAS and Hand Held Smedley Spring dynamometer were taken for pain and grip

strength.⁽²⁶⁾

Compare the effect of Cyriax physiotherapy versus Myofascial release technique on functional disability

A statistically significant improvement in PTEE scores was found in both groups. But MFR group (B) shows greater improvement in PRTEE score compare to the Cyriax group (A). The reason behind more improvement in function in MFR group (B) was: Due to MFR, returning the fascial tissue to its normative length by collagen reorganization⁽²⁵⁾ which improves the tensile strength of the muscle and thereby reducing the pain, improving grip strength and functional performance as the fascia returns to the normal length.⁽²⁸⁾ So, MFR group (B) shows greater improvement in function compare to Cyriax group (A).

Similar result was found in the study done by M.S Ajimsha et al (2012) who conducted a study on effectiveness of Myofascial release in the management of lateral epicondylitis in computer professionals over a period of 4 weeks. 68 subjects included into the study. PRTEE was main outcome of study.⁽²⁵⁾

There was significant difference found in all the outcome measures between cyriax and MFR groups. MFR group shows more benefits of providing pain relief, improve grip strength and function in lateral epicondylitis.

CONCLUSION

It can be concluded that after 12 sessions of treatment, both cyriax technique and myofascial release technique were effective in the treatment of lateral epicondylitis but MFR technique was found more effective than cyriax physiotherapy on reducing pain and improving grip strength and functions in patients with lateral epicondylitis.

LIMITATION

The study consists of a small sample size, No long term follow up was done, Only pain, grip strength and functional

disability were studied, measurements such as range of motion and quality of life were not studied, The effects on occupation related tennis elbow was not studied.

CLINICAL IMPLICATIONS

MFR is one of the advance soft tissue manipulation technique which is found to be effective in treatment of individual with lateral epicondylitis. So, MFR technique can be used along with conventional physiotherapy in clinical set ups for speedy recovery.

FUTURE RECOMMENDATION

Further study can be done with larger sample size, long term follow up, Further study may be conducted using outcome measures like ROM and quality of life, Study could also be conducted to see the effects of intervention in different occupation like computer professionals having tennis elbow.

Declaration by Authors

Ethical Approval: Approved

Acknowledgement: None

Source of Funding: None

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

REFERENCE

1. Smita Saini, Rajeshkumar Sahu. A Comparative study of effectiveness of mulligan mobilisation with movement and cyriax deep transverse friction along with Mills manipulation in individuals with chronic lateral epicondylitis. Int. J of Research and analytical reviews. 2020; 7(4):562–89.
2. Alfonso Vaquero-picado, Raul Barco, Samuel A. Antuna Lateral epicondylitis of the elbow. EFFORT Open Reviews. 2016;1(11):391-397
3. D Stasinopoulos , K Stasinopoulou , M Johnson. An exercise programme for the management of lateral elbow tendinopathy. Br.J.sports Med. 2005;39(12):944–947.
4. Dr.Roopa Desai, Dr. Swarada kulkani, Dr. Tushar Palekar et al. A comparative study of muscle energy technique versus cyriax technique in lateral epicondylitis among

- professional Indian cooks. *Int. J of Basic and applied Research*. 2019;9(6):363–371.
5. Amit V. Nagrale, MPhT; Christopher R. Herd , PT, DPT, CSCS ; Shyam Ganvir, MPhT,et al. Cyriax Physiotherapy Versus Phonophoresis with Supervised Exercise in Subjects with Lateral Epicondylalgia: A Randomized Clinical Trial. *Journal of manual & manipulative therapy*. 2009;17(3):171–178.
 6. Greg W. Johnson, Kara Cadwallader et al. Treatment of Lateral Epicondylitis. *American Academy of family physicians*. 2007; 76(6) :843-848
 7. Mohamed faisal C. K, Mary Sumila et al. Comparative study on the effectiveness of low level laser therapy versus phonophoresis in the management of lateral epicondylitis. *Nitte university journal of health science*. 2013;3(1):35–44.
 8. A Wright, K A sluka. Nonpharmacological Treatments for Musculoskeletal Pain. *Clin. J. Pain*. 2001;17(1) :33-46
 9. Rajadurai Viswas, Rajeshkumar Ramachandran, et al. Comparison of Effectiveness of Supervised Exercise Program and Cyriax Physiotherapy in Patients with Tennis Elbow (Lateral Epicondylitis): A Randomized Clinical Trial. *The scientific world journal*. 2012; 1-8.
 10. M A Gregory, MN Deane, M. Mars, Ultrastructural Changes in Untraumatized Rabbit Skeletal Muscle Treated with Deep Transverse Friction. *Physiotherapy*. 2003;89(7):408–416.
 11. Russell M Woodman, Len Pare. Evaluation and Treatment of Soft Tissue Lesions of the Ankle and Forefoot Using the Cyriax Approach: A Case Report. *Physical therapy* 1982;62(8):1144-1147.
 12. B.Ingham LPT. Transverse friction massage for Relief of Tennis Elbow. *Phys. Sports med*. 1981;9(10) :116.
 13. Ratan Khuman ,Parth Trivedi, et al. Myofascial release technique in chronic lateral epicondylitis: A randomized controlled study.*Int.J. of health sciences & research*. 2013; 3(7) :45-52.
 14. G C Goats. Massage - the scientific basis of an ancient art : part 2 . Physiological and therapeutic effects. *Br. J. Sports Med*. 1994;28(3):153-156.
 15. Birger Kadda, Ove torsteinbo.Increase of plasma beta-endorphins in connective tissue massage.*Gen Pharmac* 1989;20(4):487–489.
 16. J M Walker. Deep Transverse Frictions in Ligament Healing. *J. Orthop Sports Phys. Ther*. 1984; 6(2) :89-94.
 17. Shirley Kushner, David C. Reid. Manipulation in the Treatment of Tennis elbow. *The journal of orthopedic and sports physical therapy*. 1986;7(5):264–272.
 18. Carolyn Kisner, Lynn allen Colby. *Therapeutic exercise foundations and techniques*, 6th edition. Jaypee publications. 2012.
 19. Val Robertson, Alex Ward, John Low, Ann Reed. *Electrotherapy explained principles and practice*, 4th edition.elsevier health Sciences. 2006.
 20. G P Mills. "The treatment of tennis elbow".*Br Med J*. 1928;7(1):12-13.
 21. James H Cyriax . *Textbook of orthopaedic medicine: Volume 1*. New Delhi, AITBS, 1936.
 22. R.De Bruijn. Deep Transverse Friction; its Analgesic Effect.*Int.J.Sports.Med*.1984; (5) :35-36.
 23. Goyal, M. Kumar, Ashok Monga et al. Effect of Wrist Manipulation & Cyriax Physiotherapy Training on Pain & Grip Strength in Lateral Epicondylitis Patients. *J Exerc Sci Physiother*. 2013;9(1):17-22.
 24. Ashish J Prabhakar, Vijay kage, Deepak anap. Effectiveness of Cyriax Physiotherapy in Subjects with Tennis Elbow. *J. Nov Physiother*. 2013; 3(3):1-4.
 25. M.S.Ajimsha, Saraladevi chithra et al. Effectiveness of Myofascial Release in the Management of Lateral Epicondylitis in Computer Professionals. *Arch. Phy. Med Rehabil*. 2012;93(4) :604-609.
 26. Arun Balasubramaniam, Mohanraj Kandhasamy. Effect of Myofascial release therapy and active stretching on pain and grip strength in lateral epicondylitis. *Journal of Riphah college of rehabilitation sciences*. 2016;4(1) :3-6.
 27. Dr.Shrikrishna G. Shinde, Dr. Simran J. Purswani. Movement versus Myofascial Release Therapy on Pain and Grip Strength in Patients with Lateral Epicondylitis. *Int.J.Sci healthcare research*. 2019;4(1) :372-377.
 28. Parth trivedi,arunachalam ramchandram et al. Myofascial Release Technique with

Rucha Patel et.al. To study the effectiveness of cyriax mill's manipulation and deep transverse friction versus myofascial release technique on pain, grip strength and functional disability in subjects with lateral epicondylitis: an experimental study

Virtual Reality Biofeedback in Lateral Myofascial Release Technique with Virtual Reality Biofeedback in Lateral Epicondylitis – A Case Report. Indian journal of public health research & development. 2020;11(6) :586-591.

29. Dr.Susheesmita R, Dr.Prosenjit P. Comparison of Myofascial Release Technique and Deep Transverse Friction Massage on Pain , Range of Motion and Functional Ability in Subjects with Chronic Bicipital Tendonitis : An Comparative Study. Journal of medical science and clinical research. 2014;2(9):2399-2408.
30. Parth Trivedi, D. Sathiyavani, et al. Comparison of active release technique and

myofascial release technique on pain, grip strength & functional performance in patients with chronic lateral epicondylitis. Int J physiother Res. 2014;2(3) :488-94.

How to cite this article: Rucha Patel, Edrish Saifee Contractor. To study the effectiveness of Cyriax Mill's manipulation and deep transverse friction versus myofascial release technique on pain, grip strength and functional disability in subjects with lateral epicondylitis: an experimental study. *Int J Health Sci Res.* 2023; 13(5):20-31.

DOI: <https://doi.org/10.52403/ijhsr.20230503>
