

Immediate Effect of Mulligan Mobilization vs. Myofascial Release on Pain, Grip Strength and Function in Patients with Lateral Epicondylitis

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Abstract

Objective: To study and compare the immediate effects of Mulligan mobilization (MWM) vs. Myofascial Release (MFR) on pain, grip strength and function in patients with lateral epicondylitis.

Design: Randomized clinical trial using the chit method.

Setting: Physiotherapy and Rehabilitation centres.

Subjects: This study was carried out with 64 patients, who had lateral epicondylitis.

Intervention: Group A (n=32) had received MWM while Group B (n=32) was treated with MFR. All the subjects received only one treatment session.

Outcome measures: Pain was evaluated using Numerical Pain Rating Scale, Grip strength by using hand held dynamometer (kg), function by Patient Rated Tennis Elbow Evaluation which was recorded pre and immediately post the intervention.

Results: Both, the MWM and MFR were found to be significantly effective in reduction of pain and improvement of functional limitations. The MFR resulted in greater improvement in grip strength and function in comparison to MWM.

Conclusion: The results of this study demonstrate that MFR may be the first line of treatment for therapist for managing tennis elbow.

Keywords: Epicondylitis; MWM; MFR; Immediate effects

recurrent bouts and may last for several weeks or months. The average duration of a typical episode of tennis elbow is between 6 months to 2 years [1,2].

Being an overuse injury it is usually work related or sport related pain disorder with macroscopic or microscopic tears in the extensor carpi radialis brevis, caused by excessive quick, monotonous, repetitive eccentric contractions and gripping activities of the wrist. The dominant side arm is commonly affected, with a prevalence rate of 1-3% in the general population, but this rate increases to 19% at 30-60 years of age and appears to be more long standing and severe in women [1,2].

There is an increase in cross-linkage and collagen deposition as there is application of tension to a tendon. In response to gradually increasing forces, tendons can stretch easily. A micro tear may occur if this stress exceeds the tendon's tolerance to stretch. This will lead to degenerative changes within the tendon which is known as tendinosis [1,3].

The chief complaints of this condition are pain and decreased grip strength, both of which may adversely affect activities of daily living. There are special tests which help in diagnosis of lateral epicondylitis such as palpation over facet of lateral epicondyle of humerus, Cozen's test i.e., resisted wrist extension and Maudsley's test which means resisted middle finger extension. These tests are said to be positive when the pain is reproduced over the common extensor origin [2].

There are many manual therapy techniques that are used as interventions to treat lateral epicondylitis. Movement with mobilization is a technique of manual therapy that includes a sustained lateral glide to the elbow joint with concurrent physiological movement. This technique often works to correct the faulty position of the elbow joint. In previous studies where intervention was done for minimum 2 weeks there was improvement of pain free grip strength and increased ability to tolerate resisted wrist extension [1,2].

Myofascial release is another manual therapy technique to give relief to the patient. The technique includes application of low load; long duration stretches to the myofascial complex which aims at restoring optimal length, decrease pain and improve function. Myofascial release is an umbrella term used

Introduction

Lateral epicondylitis is one of the commonest overuse injury of the arm. This injury is difficult to treat as it is prone to

for a collection of techniques used to relieve soft tissue from an abnormal hold of a tight fascia [4].

It is important to find out the best and feasible treatment for this condition as it is quite self-limiting due to acute exacerbations of severe pain.

Literature Survey

Literature states that lateral epicondylitis is a self-limiting condition, which leads to severe pain in episodes of acute exacerbations. There is no universally accepted regime of treatment that exists for this condition [1-3].

Literature states that mulligan mobilization and myofascial release as treatment interventions are equally significant in improving pain and grip strength over an intervention period of 2 weeks [3].

But, this study will include immediate effects of Mulligan mobilization and MFR on functional limitations.

Data and Approach

Sample size: 32 in each group.

Study Type: Experimental study.

Outcome measures: Pain (NPRS), Grip strength (hand held dynamometer) and function (PRTEE-Patient rated tennis elbow evaluation).

Inclusion criteria:

1. Age group 20 years to 60 years, both males and females
2. Positive Cozen's test and Maudsley's test
3. NPRS - 4 and above.

Exclusion criteria:

1. Active medications.
2. Recent trauma.
3. Swelling around the elbow joint.

Research Methodology

A total of 64 individuals in total, both male and female were randomly assigned into the two groups of mulligan MWM and MFR using the chit method. 32 individuals within the age group 20-60 years of age (mean=33.68 years, SD=7.06), having tennis elbow defined by positive Cozen's test and Maudsley's test, were recruited in Group A- Mulligan mobilization. 32 individuals within the same age group (mean=35.96 years, SD=9.22) were recruited in Group B- Myofascial Release. Subjects with active medications, recent trauma around the same elbow joint, swelling around the elbow joint were excluded from the study. An ethical clearance was obtained from the institution's ethical committee. All the subjects read and signed the informed consent.

Pre-assessment

Pain was assessed by using the Numerical Pain Rating Scale, Grip strength was assessed by using the hand held dynamometer (kgs) and function was assessed by using the Patient Rated Tennis Elbow Evaluation Scale.

Numerical pain rating scale

The NPRS was used to assess the intensity of pain at the time of data collection. The scale starts from 0 denoting no pain and ends at 10 denoting the worst pain.

Hand held dynamometer

Maximum grip strength was measured by using the Hand held dynamometer with its values in kgs. Its validity in diagnosing and evaluating the improvement in Lateral Epicondylitis has been previously reported.

Patient rated tennis elbow evaluation

It is a valid, reliable and sensitive outcome measure for understanding the difficulties while performing functional activities.

Mulligan mobilization technique

Mulligan mobilization belt was placed around the proximal forearm close to the elbow joint line of the subject and across the shoulder of the therapist while the distal humerus was stabilized with one hand. A lateral glide was applied to the subject's forearm through the belt and sustained for about 10-15 seconds. At the same time the patient was asked to perform repeated wrist extension against manual resistance applied by the therapist. The lateral glide given was released after the subject was able to perform pain-free wrist extension. Three repetitions were performed with a rest interval of 15-20 seconds between each repetition [2,4].

Myofascial release technique

The subjects were made to lie on the plinth in supine position with the affected side arm internally rotate, elbow slightly flexed and pronation, palm resting on the plinth. The therapist stood on the affected side, near the shoulder and facing the hand. Myofascial release was given from the common extensor origin to the extensor retinaculum of the wrist. Fingertips were used to engage the periosteum and this contact was carried inferiorly to common extensor tendon and then down to extensor retinaculum of the wrist. Treatment intervention was given for duration of 5 min and 2 repetitions. Post intervention assessment of pain, grip strength and function was done immediately [3-5].

Results

Table 1 describes the baseline parameters and post treatment values of Group A and Group B when analysed within the group. The post treatment values were found out to

be extremely significant with p value of 0.0001 in each of the outcome measures i.e., Pain (NPRS), grip strength (kgs) and function (PRTEE).

Table 1 Baseline parameters and post treatment values for Group A and Group B: Within the Group.

Outcome Measures	Group A Mean (SD)		Group B Mean (SD)		P value
Age (in years)	33.68 (± 7.06)		35.96 (± 9.22)		
	Pre	Post	Pre	Post	
NPRS	6.06 (± 1.08)	4.03 (± 0.97)	6.09 (± 1.05)	4.00 (± 1.13)	0.0001
Grip Strength (kgs)	16.53 (± 7.74)	19.25 (± 7.56)	14.56 (± 6.53)	18.06 (± 6.64)	0.0001
Function (PRTEE)	55.81 (± 6.59)	52.09 (± 6.65)	59.81 (± 6.49)	55.43 (± 6.07)	0.0001

Table 2 describes the p value and significance when analyzed between Group A and Group B. The p value for pain (NPRS) was found out to be 0.7299 which suggests non significance difference between both the groups, using the Mann Whitney U test. This helps us understand that there was equal reduction of pain in both the groups. The p value for grip strength (kgs) was found out to be 0.0028 which suggests that individuals in Group B had significant improvement in grip strength when compared with individuals in Group A, using unpaired t test. The p value for function (PRTEE) was found out to be 0.0216 which suggests that individuals in Group B had lesser limitations in their daily functions post treatment when compared with Group A, using Mann Whitney U test.

Table 2 Baseline parameters and post treatment values for Group A and Group B: Within the Group.

Outcome Measures	P value
NPRS	0.7299
Grip Strength (kgs)	0.0028
Function (PRTEE)	0.0216

So, the results found out in this study suggests that effect of Mulligan mobilization and Myofascial Release is the same on pain reduction whereas in improving grip strength and function, Myofascial Release was found out to be more effective than Mulligan Mobilization.

Discussion

This study was done to find out and compare the immediate effects of Mulligan mobilization and Myofascial Release on pain, grip strength and function in patients with Lateral Epicondylitis. Mulligan mobilization and Myofascial release showed significant reduction of pain, improvement in grip strength and function, when analysed individually. But when between group analysis was done, equally significant results were seen in reduction of pain. Grip strength and Functional limitations were more significantly improved in Group B (Myofascial Release) than in Group A (Mulligan Mobilization).

Mulligan Mobilization with movement is known to be a modern technique which was developed by Brian R. Mulligan.

Being a form of manual therapy, Mulligan mobilization includes a sustained lateral glide to the elbow joint along with concurrent physiological movement that is wrist extension [2].

Paungmali in 2004 showed that Mulligan mobilization with movement produces sensory input sufficient to recruit and activate descending pain inhibitory systems that result in most of the pain relieving effects. Hypoalgesic effects are also produced during and following the application, as well as sympatho excitatory effects. Similarly the present study has given significant results due to the previously mentioned mechanism with which Mulligan mobilization works [3,6-10].

Yang in 2000, showed that Mulligan mobilization with movement technique was proposed to restore normal tracking of the radius over the capitulum so that strengthening of forearm muscles can be done without painful symptoms which leads to pain-free grip strength. Based on the above mentioned mechanism, the present study has given significant improvement in pain and grip strength [11,12].

Therapists who practice Myofascial release technique believe that by restoring the length of the restricted connective tissue, pressure can be relieved on pain sensitive structures such as tendons, nerves and blood vessels [3-5].

Myofascial release also provide analgesic effects which can stimulate the afferent pathways and lead to excitation of afferent A fibers, which can thus cause segmental pain modulation through the activation of descending pain inhibitory systems [3].

Connective tissues have properties such as plasticity, viscoelasticity and piezo electric property which can be regained through application of Myofascial release in subjects with lateral epicondylitis. Based on the above mentioned mechanism, the present study has shown significant improvement in Group B that received Myofascial Release [3].

Moneet Kochchar, Ankit Dogra in their study concluded that MWM and US group demonstrated a 97% improvement in VAS when compared with the US and control group [13]. Results highlighted the effect of Mulligan techniques increasing functional activities, as the experimental group showed more improvement of PRTEE (patient rated tennis elbow evaluation), than the control group [14].

Tamilvanam Bill Vincenzino in their study stated that under normative conditions, connective tissue and fascia tend to move with minimal restrictions. Physical trauma, repetitive strain injury and inflammation may result in injuries which are thought to decrease fascial tissue length and elasticity, which results in fascia restriction. Pain reduction is due to fascial tissue returning to its normative length by reorganization of the collagen [15].

Hence both, Mulligan mobilization and Myofascial release show significant results on pain, grip strength and functional limitations in subjects with lateral epicondylitis.

Conclusion

This study concludes that, Mulligan mobilization and Myofascial release had significant effects on pain, grip strength and function in patients with lateral epicondylitis when analysed individually. But when between group analyses were done, in case of grip strength and functional limitations Myofascial Release showed better results. Further scope of study is Larger sample size can be taken into consideration, Hand dominance can be taken into consideration and Long term effects can be analysed by follow ups.

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