International Journal of Yoga, Physiotherapy and Physical Education
ISSN: 2456-5067
Impact Factor: RJIF 5.24
www.sportsjournal.in
Volume 3; Issue 3; May 2018; Page No. 34-38

Correlation between mobilisation with movement v/s conventional physiotherapy in acute inflammation of medial side of elbow

Navdeep Kshitij Dave
MPT Student, School of Physiotherapy, Madhav University, Rajasthan, India

Abstract
Background: Medial epicondylitis or 'golfer's elbow' is mostly a tendinous overload injury leading to microtearing. Thereby tendon degeneration appears instead of repair. The most sensitive region is located near the origin of the wrist flexors on the medial epicondyle of the humerus. Sometimes the patient also experiences pain on the ulnar side of the forearm, the wrist and occasionally in the fingers
Need of the study: movement with mobilisation is the manual therapy procedure used in the treatment of medial epicondylitis. These techniques help in reduction of pain in short period, conventional physiotherapy has been found effective in decrease the pain & restoring the joint play by maintaining & establishes proper structure alignment by balancing the tissue length tension relationship for prolonged period. There are no studies on the effect of mobilization in the management of the medial epicondylitis, this study is an attempt to evaluate the efficacy of conventional physiotherapy as an adjunt to mobilization in improving the functional ability and reduction of pain in medial epicondylitis.
AIM: - To correlate the effectiveness of MWM and conventional physiotherapy in acute medial epicondylitis
Methodology: Study Design: Experimental study. Study Setting: Madhav University and Ahmadabad Sampling Technique: Convenient sampling technique Study Population: Male and Female Study Sample: 30 subjects Study Duration: Training duration: Daily one session Total Study duration - 4 weeks.
Results: The result shows that the use of Mulligan mobilization and conventional physiotherapy in relieving pain, improving grip strength and improve functional performance in subject with medial epicondylitis.
Conclusion: The present randomized clinical trial provided evidence to support the use of Mulligan mobilization and conventional physiotherapy in relieving pain, improving grip strength and improve functional performance in subject with medial epicondylitis. In addition, results supported that Mulligan mobilization was more effective than conventional physiotherapy in reducing pain and functional performance.

Keywords: mulligan mobilization, medial epicondylitis, conventional physiotherapy

Introduction
Medial epicondylitis or 'golfer's elbow' is mostly a tendinous overload injury leading to microtearing. Thereby tendon degeneration appears instead of repair [1]. The most sensitive region is located near the origin of the wrist flexors on the medial epicondyle of the humerus. Sometimes the patient also experiences pain on the ulnar side of the forearm, the wrist and occasionally in the fingers.

Epidemiology/Etiology
Medial epicondylitis has a lower incidence than lateral epicondylitis (tennis elbow), with the former containing only 9 to 20% of all epicondylitis diagnoses. The 'golfer's elbow' and 'pitcher's elbow' are synonyms. The pathology occurs in baseball pitchers as a result of high-energy valgus forces created by the overhead throw. It has also been reported with tennis, bowling, archery, weightlifting, javelin throwing, racquetball and american football. However 90 to 95% of all cases do not involve sportsmen. Because chronic repetitive concentric or eccentric contractile loading of the wrist flexors and pronator are the most common etiology, occupations such as carpentry, plumbing and meat cutting have also been implicated. The pathology may also be produced by sudden violence to these tendons in a single traumatic event [4]. In many cases trauma at work had been identified as the cause of the symptoms [5].
More specific occupational physical factors associated with medial epicondylitis are forceful activities among men and with repetitive movements of the arm among women. Current smokers and former smokers are also associated with medial epicondylitis, so do patients who suffer from diabetes type 2.

Characteristics/Clinical Presentation
Although epicondylitis means there is an inflammation, there is some controversy with this pathology. The pathologic process does not involve bony inflammation. Histologically it has been shown that medial epicondylitis is the result of microtearing in the tendon that isn't fully relapsed (=to fall or slide back into a former state). Some physical therapists prefer the term tendonosis instead of epicondylitis [8]. Another terminology for this condition is epicondylalgia, referring to pain rather than inflammation. Most of the time, golfer's elbow is not caused by inflammation. Rather, it is a problem

within the cells of the tendon. In tendonosis, wear and tear is thought to lead to tissue degeneration. A degenerated tendon usually has an abnormal arrangement of collagen fibers and fiber separation by increased mucoid ground substance. There can also be an increased prominence of cells and vascular spaces and focal necrosis or calcification. When this happens, the collagen loses its strength. It becomes fragile and can break or be easily injured. Each time the collagen breaks down, the body responds by forming scar tissue in the tendon. Eventually, the tendon becomes thickened from extra scar tissue. The tendon changes from a white, glistening and firm surface to a dull-apearing, slightly brown and soft surface.

As medial epicondylitis is a tendonosis of the flexor group tendons attached to the medial epicondyle of the humerus, the most sensitive region will be located near the origin of the wrist flexor group.

The patient usually complains about pain of the elbow distal to the medial epicondyle of the humerus with radiation up and down the arm, most common on the ulnar side of the forearm, the wrist and occasionally in the fingers.

Local tenderness over the medial epicondyle and the conjoined tendon of the flexor group, without evidence of swelling or erythema, are also characteristics that can occur. Other symptoms are stiffness of the elbow, weakness in the hand and the wrist and a numb or tingling feeling in the fingers (mostly ring and little finger).

Aim & Objectives

AIM: To correlate the effectiveness of MWM and conventional physiotherapy in acute medial epicondylitis

Objectives

- To evaluate the effectiveness of strengthening exercise, US and stretching on pain and disability of patient with medial epicondylitis.
- To evaluate the effectiveness of MWM, US on pain and disability of patient with medial epicondylitis.

Hypothesis

Alternative Hypothesis

Treatment using Mulligan mobilization and strengthening exercise shows significant difference in pain and disability in patients with medial epicondylitis.

Null Hypothesis

Treatment using Mulligan mobilization and strengthening exercise does not show any significant difference in pain and disability in patients with medial epicondylitis.

Review of Literature

1. Bryan Chung, J ability due Wiley. *et al*. (2010): Studied the validity of PRTEE. The PRTEE had questionable discriminant ability due to its moderate test-retest reliability and possibly due to low convergent validity with other measures of similar constructs. The PRTEE appears to be sensitive to change, but the margin of difference between a clinically relevant change and no change is very small.
2. Tom J. Overend, Jennifer C, Wuori-Fearn, John. F. Kramer. *et al*. (1999): Studied the reliability of a questionnaire designs to assess forearm pain function in patient with lateral epicondylitis. The PRTEE or PRFEQ has been found to effective in providing simple, quick and reliable estimations of arm pain functions in patients with lateral epicondylitis.
3. Bryan chung, J Preston wiley *et al*. (2010): studied validity, responsiveness and reliability of PRTEE. they conclude that it is having questionable discriminant ability due to its moderate test-retest reliability and possibility due to low convergent validity with other measures of similar constructs.
4. Won-Hwee Lee, Oh et.at. (2011): Studied the effect of taping on wrist extensor force reproduction and wrist joint position reproduction with or without lateral epicondylitis. The lateral epicondylitis group had a significantly higher FR and JPR errors. Taping significantly improved force reproduction and joint position reproduction error.
5. Alirza Shamsoddini, Mohammad Taghi Hollisaz, *et al*. (2010) studied the initial effect oftaping techniques in subjects with tennis elbow by testing grip strength, wrist extension muscle force and range of motion wrist extension immediately after the application of taping techniques. Results showed impressive effect on wrist extension, grip strength and pain.
6. Stasinopoulos, K Stasinopoulu, M I Johanson *et al*. (2012): Studied the exercise program for the management of tennis elbow. Study described the use and effects of strengthening and stretching exercise program in the treatment of tennis elbow. They concluded that the well designed trial is needed to study the effectiveness of supervised exercise program for tennis elbow consisting of eccentric and static stretching exercise.
7. Magnus Peterson, Stephen butler, *et al*. (2011): studied randomized controlled clinical trial on the effect of exercise versus expectation on pain, muscle strength, function and quality of life in patients with long standing lateral epicondylosis. They found that exercise group had greater and faster regression of pain, both during muscle contraction and muscle elongation than the reference group.
8. Moneet Kochar and AnkitDogra(2002): conducted a clinical study on Effectiveness of a specific physiotherapy regimen on patients with Tennis Elbow on 66 patients who were randomized into 3 groups, The first (MM) group was treated with a combination of ultrasound therapy and Mulligan mobilization while the second group was treated with ultrasound therapy alone for ten sessions (completed within three weeks). Both groups followed a progressive exercise regime for a further nine weeks, third group as control group. They were evaluated at weekly intervals from the time of selection until the third week and finally at the 12th week with four outcome measures: visual analogue scale (VAS), isometric grip strength, weight test and patient assessment test. The results conclude that the MM group showed improvement on most parameters than other groups and found that the addition of Mulligan mobilization to a regimen comprising ultrasound therapy and progressive exercises brings about increased and faster recovery in patients with tennis elbow.
9. A Binder, G Hodge, A M Greenwood, B L Hazleman, and

D P Page Thomas (1985): Conducted a randomized study to determine the effectiveness of therapeutic ultrasound in treatment of soft tissue lesions. They included 76 patients with lateral epicondylitis, 38 were randomly allocated to receive ultrasound treatment and 38 placebo. The conditions of 24 patients (63%) treated with ultrasound and 11 (29%) given placebo improved, the difference being significant at the 1%. Improvement in particular

10. Pienimaki, Tuomo, Tarvainen. *et al*. (2002), Studied the association between changes in pain and grip strength and manual tests among patients with chronic tennis elbow. Pain thresholds at the lateral epicondyle are strongly associated with pain on palpation and with a positive Mill's test. Resisted extension test results reflect decreased grip strength.
11. OritShechtman, Lisa Gestewitz and Christine Kimble have done a study to examine the reliability and validity of the digital DynEx dynamometer. Grip strength testing was conducted on 100 healthy subjects (aged 20–40 years) using both the Jamar and DynEx dynamometers in the second handle position.The results of this study indicate that concurrent validity between the two instruments was excellent.

Methodology

- **Study Design:** Experimental study.
- **Study Setting:** Madhav University and Ahmadabad
- **Sampling Technique:** Convenient sampling technique
- **Study Population:** Male and Female
- **Study Sample:** 30 subjects
- **Study Duration:** Training duration: Daily one session Total Study duration - 4 weeks.

Criteria for Selection

Inclusion Criteria

- Age group of 30-60 years with symptomatic medial epicondylitis on either side.
- Both males and females.
- Positive special tests confirming medial epicondylitis

Exclusion Criteria

- Patient having history of trauma, surgery, acute infections.
- Patient who have received steroid injections within last 30 days in elbow joint.
- Severe neck or shoulder problems with radiating pain to upper limb.
- Fractures around elbow complex.

Materials Used In the Study

- Mulligan belt
- Hand held dynamometer
- Ultrasound machine frequency 1MHZ
- Ultrasonic gel
- couch
- stool
- Plinth
- pen
- paper
- Data collection sheet.
- PREE

Method

Patients will be included in the study after the initial assessment and informed consent will be taken. Subjects who fulfill the inclusion criteria will be assigned into two groups based on *convenient random sampling*. Pre test evaluation will be done before starting treatment which includes pain assessment using PREE and pain free grip strength by hand held dynamometer.

Group A *(n=15*) will be given *Mulligan's Mobilization With movement* on the involved elbow joint, with patient lying in supine position having their elbow flexed and forearm supinated. The mulligan belt is kept around the therapist's shoulder and a medial glide will be given to the proximal part of the patient's elbow joint. During the medial glide, the patient is asked to perform the pain producing movement (such as gripping or resisted isometric contraction wrist flexor). If the glide is applied correctly then the patient will not feel any pain on medial Glide Produced via the Mobilization Belt Concurrent with Strong Resisted Isometric Wrist flexion. The dosages are 3 sets of 10 pain free mobilizations in each set with one minute rest time between each set.

Group B *(n=15*) will be given All individual with male and female are included in this study. in this study shown effect of conventional physiotherapy treatment in patient with medial epicondylitis. And check a difference in pain and functional ability difference in pre and post by use in PREE SCALE.

We have taken 30 subjects from various clinics of ahmedabad city and give knowledge about medial epicondylitis and give knowledge about exercises. The exercises are strengthening exercises and give instruction to how do exercises the instruction are all these exercise done daily 2-3 time. In every exercise 5 second hold and then relax and do a 10 repetition of each exercises each exercises have a same instruction and all exercises do regular.

Results

A study was performed in which PREE and Hand grip strength was assessed in both groups.

The pre and post values for PREE and Hand grip strength were collected for both the groups.

Statistics was performed using unpaired t test and paired t test for Hand grip strength within and between the groups respectively, whereas Wilcoxson test and Mann Whitney U test was used for PREE within and between the groups respectively.

Table 1: Comparison of PREE in group A and B (within group)

variable	mean		S.D		P value		w value	Result
Pree	pre	post	Pre	Post	Pre	Post		
Group a	52.1	46.53	14.92	14.36	<0.0001	0.0007	120	
Group b	50.83	47.47	13.82	11.82	<0.0001	0.0007	120	

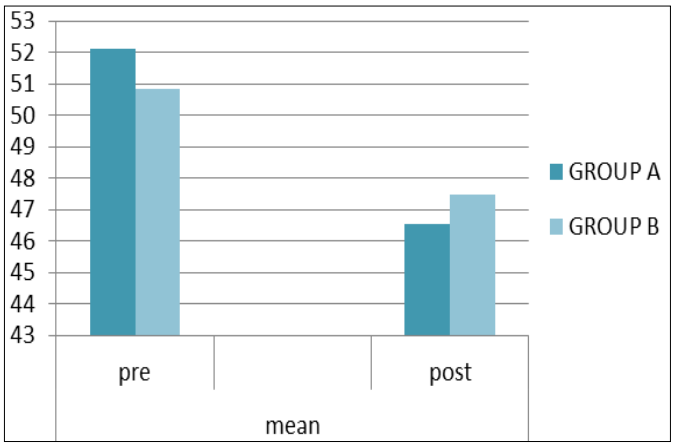

Fig 1

- The PREE comparison within group A and B with pre mean of group A being 52.10 and post mean being 46.53, whereas for group B pre= 50.83 and post=47.47.
- The s.d. pre and post value for group A is 14.92 and 14.39 respectively. The s.d. pre and post value for group B is 13.14 and 11.82 respectively.
- The pre and post P value for both the groups being p<0.0001 and p=0.0007 respectively therefore the result is significant.

Table 2: Comparison of Hand grip strength in Group A and B(within group)

variable	mean		SD		T value	P value	Results
Hand grip strength	Pre	Post	Pre	Post			
Group A	15.4	15.99	4.931	5.099	0.3385	0.7375	n. sign.
Group B	14.5	14.95	6.054	6.054	0.1749	0.8684	n. sign.

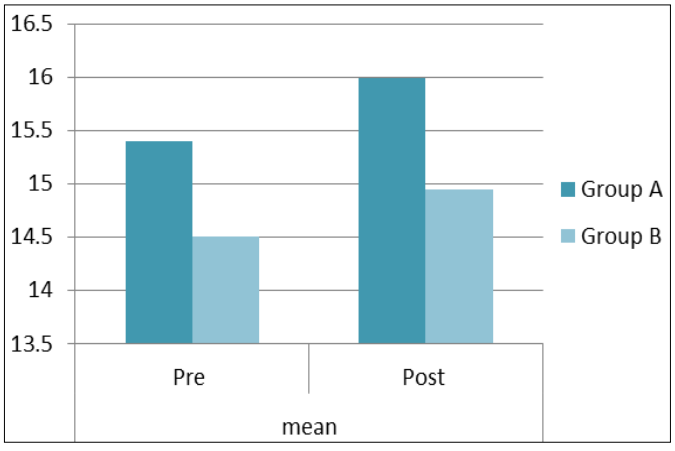

Fig 2

- The Hand grip stremgth comparison within group A and B with pre mean of group A being 15.37and post mean being 15.99, whereas for group B pre= 14.56 and post=14.95.
- The s.d. pre and post value for group A is 4.931 and 5.099 respectively. The s.d. pre and post value for group B is 6.054 and 6.054 respectively.
- The p value=0.7375 for group A and 0.8624 for group B, therefore the result is not significant.

Table 3: Comparison of PRTEE between Group A and B

variable	Mean		SD		U value	P value	Result
PREE	Pre post	Pre post	Pre post	Pre post			
	5.567	3.367	2.809	2.985	54	0.0156	significant

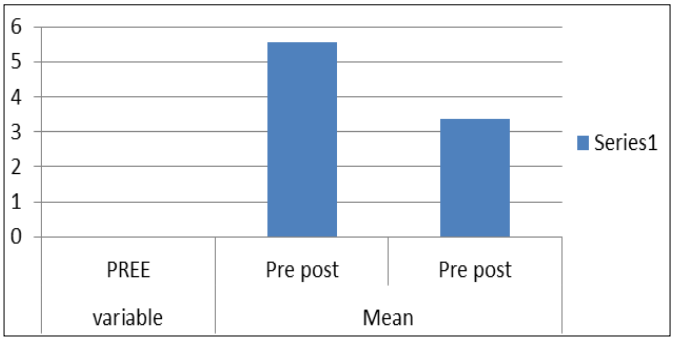

Fig 3

- The PRTEE between group A and B with pre mean difference of 5.567 and post mean difference of 3.367.
- The pre s.d. difference being 2.809 and post s.d. difference being 2.985.
- The p value=0.0156, therefore the result is significant.

Table 4: Comparison of hand grip strength between group A and B

Variable	mean		SD		T value	P value	result
Hand grip strength	Pre post	Pre post	Pre post	Pre post			
	0.62	0.3867	0.5158	0.285	1.478	0.1615	N.S

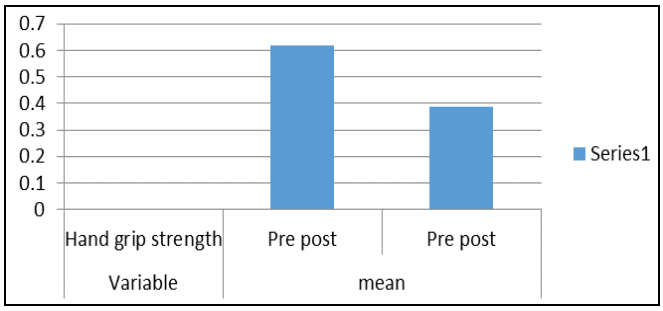

Fig 4

- The Hand grip strength between group A and B with pre mean difference of 0.6200 and post mean difference of 0.3867.
- The pre s.d. difference being 0.5158 and post s.d. difference being 0.2850.
- The p value=0.1615, therefore the result is not significant.

Discussion

The present clinical trial was conducted to compare the effectiveness of Mulligan moblisation and taping technique with common treatment of therapeutic ultrasound and stretching strengthening exercise in subjects with medial epicondyitis. Result of the study were focused on improvement of grip strength was measured with the help of hand dynamometer and reduction in function actually improvement scored based on PREE for lateral epicondylitis. It was noticed that there was improvement in the above

parameters in both groups. Peter Hoogvliet Manon S Randsdorp Rudi Dingemanse Bart W Koes Bionka M A Huisstede Does effectiveness of exercise therapy and mobilisation techniques offer guidance for the treatment of lateral and medial epicondylitis AlirzaShamsoddini, Mohammad TaghiHollisaz, *et al*. (2010):Studied the initial effect of taping techniques in subjects with tennis elbow by testing grip strength,wrist extension muscle force and range of motion wrist extension immediately after the application of taping techniques.Results showed impressive effect on wrist extension, grip strength and pain.

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(VAS), isometric grip strength, weight test and patient assessment test. The results conclude that the MM group showed improvement on most parameters than other groups and found that the addition of Mulligan mobilization to a regimen comprising ultrasound therapy and progressive exercises brings about increased and faster recovery in patients with tennis elbow.

Mulligan mobilization is the commonest manual therapy procedures used in the treatment of lateral epicondylitis.

These techniques help in reduction of pain immediately after the technique is applied for short period Taping has been found effective in decreasing the pain & restoring the joint play by maintaining & establish proper structural alignment by balancing the tissue length/tension relationship for prolonged period.

Different therapeutic regimes were evaluated: stretching, strengthening, concentric/eccentric exercises and manipulation of the cervical or thoracic spine, elbow or wrist. No statistical pooling of the results could be performed owing to heterogeneity of the included studies. Therefore, a best-evidence synthesis was used to summarise the results. Moderate evidence for the short-term effectiveness was found in favour of stretching plus strengthening exercises versus ultrasound plus friction massage. Moderate evidence for short-term and mid-term effectiveness was found for the manipulation of the cervical and thoracic spine as add-on therapy to concentric and eccentric stretching plus mobilisation of wrist and forearm. For all other interventions only limited, conflicting or no evidence was found.

Conclusion

The present randomized clinical trial provided evidence to support the use of Mulligan mobilization and conventional physiotherapy in relieving pain, improving grip strength and improve functional performance in subject with medial epicondylitis.

In addition, results supported that Mulligan mobilization was more effective than conventional physiotherapy in reducing pain and functional performance.

Summary

The purpose of this study is to determine the effectiveness of Mulligan mobilization and conventional physiotherapy in medial epicondylitis. Individuals (N= 15) were randomly assigned into a group containing 13 females and 2 males in group A and group B containing 09 females and 06 males. Group A was treated with Mulligan mobilization and US where as group B was treated with strengthening exercise, US and stretching.

The measurement used is hand dynamometer and PREE. Each subject was measured before and after 4 weeks of treatment. The result of this study indicate that the mean improvement in hand grip strength when compared in pre and post treatment did not show significant improvement within and between the groups with $p>0.05$.

The result of this study indicate that the mean improvement in PREE when compared in pre and post treatment shows significant improvement within and between the groups with $p<0.05$.

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