

## Comparison of Mobilization with Movement and Soft Tissue Mobilization on Pain Severity, Hand Grip Strength and Functional Activity in Tennis Elbow Patient

### ABSTRACT

#### Background And Aim

Lateral epicondylitis or tennis elbow is a pain pattern most commonly seen in tennis player due to forceful repetitive movements in a wrong way. So, the Objective was to determine the comparison of mobilization with movement and soft tissue mobilization on pain, grip strength and functional activity in patients with tennis elbow.

#### Methodology

In this Randomized Controlled Trial, Non probability sampling technique was used. Thirty tennis players having lateral epicondylitis pain were included in the study. Two interventions were used i.e. Mobilization with movement and soft tissue mobilization. Pain, Muscle power and function activity were 3 outcome measure in both groups.

#### Results

In both groups the mean age of the participants was  $24.30 \pm SD 3.01$ . There was a significant Mean difference in the pain scores for MWM (5.34) and Soft Tissue Mobilization (3.74) after treatment. P value is significant for both group but there was greater difference with group MWM.

#### Conclusion

The present study concluded that Mobilization with movement has greater effect than the Soft Tissue Mobilization in relieving pain and improving Hand grip strength and functional activity in patients with tennis elbow.

#### Keywords

Movement, soft tissue, pain, grip, hand strength functional status, tennis elbow

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[Shafique S, Muneeb HN, Abbas N, et al. Comparison of Mobilization with Movement and Soft Tissue Mobilization on Pain Severity, Hand Grip Strength and Functional Activity in Tennis Elbow Patient Pak.j.rehabil. 2022; 11(1):72-79 DOI: 10.36283/pjr.zu.11.1/010]

## INTRODUCTION

Lateral epicondylitis injury affecting the origin of tendons of main wrist extensors muscle<sup>1</sup>. Lateral epicondylitis was most commonly seen in tennis player and it as seen less commonly in different professionals like electricians or carpenters and also in plumbers<sup>2</sup>. Nearly 45% of professional tennis players are mostly affected with Lateral epicondylitis due to forceful repetitive movements like pronation and supination of forearm movements in a wrong way<sup>3</sup>. Tennis elbow was expected to affect almost 1–3% of adult per year and mostly occur in the dominant side arm<sup>4</sup>. It is commonly considered as overuse injury which involve repeated movements like wrist extension mostly against resistance, but it can be due to any acute injury<sup>1</sup>. Almost 50% of all tennis player may develop sign and symptoms due to different factors during the game including bad posture especially poor swing, technique and by using heavier racquets<sup>5</sup>. Tennis elbow exhibits as an inflammation over the main lateral epicondyles of arm bone i.e. humerus, and severe pain due to any type of such activity which involve some resisted dorsiflexion at wrist joint<sup>6</sup>. Its main symptoms can remain almost for 6 months to almost 2 years, but symptoms may be resolve itself or own its own within a year. The Tennis elbow pain mostly involve and affects a person s dominant side / arm, and the its severity may be increase over time and may persist for more than 2 years even in female<sup>7</sup>. Tennis elbow was expected to affect almost 1–3% of adult per year and mostly occur in the dominant side arm. It is commonly considered as overuse injury which involve repeated movements like wrist extension mostly against resistance, but it can be due to any acute injury<sup>8</sup>. A common demonstration and clinically presentation of the disorder may mainly just pain and tenderness at the location of injury i.e. lateral epicondyle at elbow, the radial or lateral head, and over the fascia in between both the origins of mainly extensor muscles that may radiate towards the forearm<sup>9</sup>. Many people do complaint of weak strength and grip of hand and painful grasp, ultimately resulting in shaking hands during usual activities of daily living for example turning or opening a door handle, picking or lifting something in hand may be just a cup of tea of a glass of water, or holding a briefcase or any weight may create or aggravate pain around the lateral epicondyle. Mobilization with movement is consider an effective management for patients suffering from tennis elbow<sup>5</sup>. Evidence said that an extensors fasciotomy, Extracorporeal shock wave therapy, ultrasound therapy, local corticosteroid injections, conservative management like physical therapy, or acupuncture also shown to be an effective therapeutic techniques for long-term relief of pain and improvement in function in patients of tennis elbow. (8) Mobilization with movement is consider an effective management for patients suffering from tennis elbow<sup>5</sup>. Mobilization with Movement /MWM is combination of manual - therapy techniques as well as exercise and special movement patterns which claim to offer an immediate relief of pain and improvement in the range of motion of that joint also improves the functional activities<sup>7</sup>. Theoretically, MWM work by repositioning the main positional faults. MWM correct these faults by repositioning the joint and muscular balances and causing it to retract them back normally<sup>10</sup>. The rationale of this study was to compare the effects of Mobilization with Movement and Soft Tissue Mobilization in Patients of Tennis Elbow. The main purpose of this research was to check which is more beneficial in reducing pain and improving Hand grip Strength and Functional Activity either Mobilization with Movement or Soft Tissue Mobilization technique.

## METHODOLOGY

The study design was Randomized Clinical Trial. Non probability sampling technique was used. The study was conducted at Pakistan sports board Lahore and Hidayat Gillani orthopedics, trauma and rehabilitation center Sahiwal. The study was conducted in between October 2020 to June 30, 2021. Sample size is 30, calculated by Epitool. Tennis players with Age group between 15-30 years with Positive specific tests (cozen test, mills test) were included in this study. Patients having pain intensity >3 on Numerical pain rating scale were

included in the study. Tennis player with any history of neurological disorder or other elbow deformity or joint pathology were excluded. Ethical approval was taken from research and ethics committee of Riphah college of Rehabilitation and Allied Health Sciences with Ref.No. REC/RCR & AHS/21/0420. Data was collected after obtaining informed consent from participants. Patients were divided into 2 groups i.e. Mobilization with Movement (MWM) group and Soft Tissue Mobilization (STM) group randomly by lottery method. In MWM group the participants received intervention 3 session per week for 4 weeks hence total 12 sessions. In soft tissue mobilization (STM) group the participants also received intervention 3 session per week for 4 weeks hence total 12 sessions. Each session lasted 20-30minutes. The session was repeated three times a week for 4 weeks. Pain, Muscle power and function activity were 3 outcome measure in both groups .Pain assessment was done by 11 Point NPRS, where the end points are extremes of no pain and worst pain. The NPRS is a Reliable and valid pain assessment scale in tennis elbow patients<sup>11</sup>. Patient-related tennis elbow evaluation (PRTEE) index was used to assess functional status of tennis elbow patients on initial visit and after 4th week. The PRTEE is a valid and reliable instrument for tennis elbow patients<sup>12</sup>. Manual muscle testing is a reliable tool for assessing muscle strength in tennis elbow patients<sup>13</sup>. The data analysis was done by using SPSS version 21.

## RESULTS

Out of 30 patients, there were 15 (50%) in each group. Mean age of the participants was  $24.30 \pm SD 3.01$  years, 80% were male and Only 2 out of 30 participants was having left side involved and 26 i.e. 86% was having right side affected with tennis elbow. Normality of data was checked by Shapiro wilk test that showed that data was normally distributed with p value > 0.05. Parametric tests were used to compare both groups at pre-treatment and post treatment level. Independent sample t-test was applied to measure difference between two groups. Paired sample t test was applied to measure difference within each group. Figure 1 shows that in both groups the mean age of the participants was  $24.30 \pm SD 3.01$  Years.

Figure 1: Age of the participant's histogram

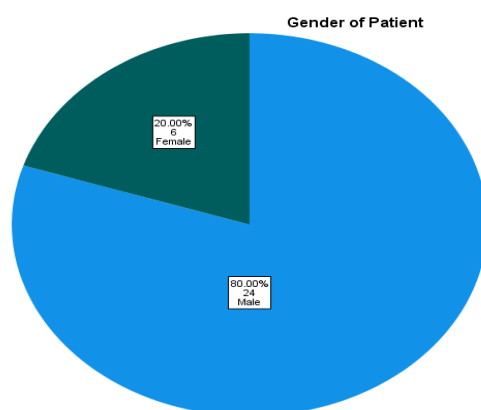
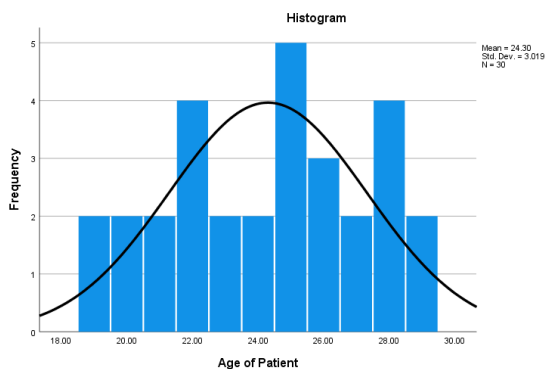


Figure 2 shows that 20 % female and 80% were male.

Figure 2: Gender Of participant pie chart



Only 2 out of 30 participants was having left side involved and 26 i.e. 86% was having right side affected with tennis elbow.

Figure 3: Side of Injury Pie chart

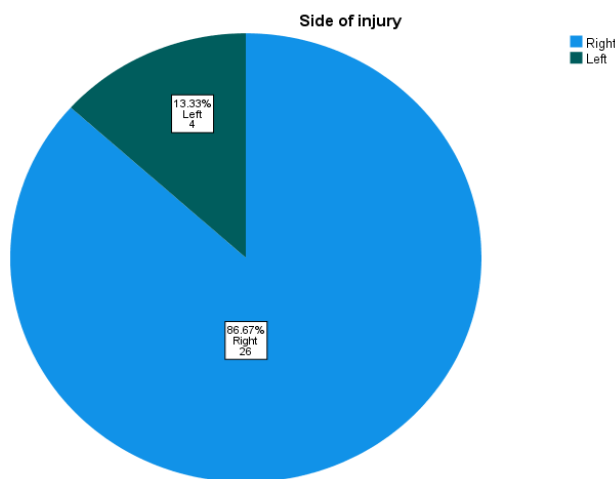


Table: 1 Pain at baseline and post treatment within group and in between group

	Group MWM Mean ± SD	Group STM Mean ± SD	Mean Differe nce	P Value
Pre treatment	6.4 ±0.82	7.0±0.92	-0.6	0.072
Post treatment	1.06±0.8 8	3.26±0.7 9	-2.2	0.00
Mean Difference	5.34	3.74		
P Value	0.00	0.00		

A paired sample t test and an independent samples t-test was conducted to compare the effects of MWM and Soft Tissue Mobilization in in between and within group. There was a significant Mean difference in the pain scores for MWM (5.34) and Soft Tissue Mobilization (3.74) after treatment. P value is significant for both group but there was greater difference with group MWM than group STM.

Table: 2 Grip Strength at baseline and post treatment within group and in between group

	Group MWM Mean $\pm$ SD	Group STM Mean $\pm$ SD	Mean Difference	P Value
Pre treatment	26.46 $\pm$ 3.13	21.06 $\pm$ 6.35	5.40	0.006
Post treatment	44.86 $\pm$ 3.31	33.33 $\pm$ 6.3	11.53	0.00
Mean Difference	18.4	12		
P Value	0.00	0.00		

Group MWM pre-treatment values were  $26.46 \pm 3.13$  while Post treatment values were  $44.86 \pm 3.31$ . Mean Difference was 18.4 and p value  $< 0.05$ . While in Group STM pre-treatment values were  $21.06 \pm 6.35$  while Post treatment values were  $33.33 \pm 6.3$ . Mean Difference was 12 and p value  $< 0.05$ . There was significant difference after both techniques but there was greater difference with group MWM than group STM.

Table: 3 Specific activities at baseline and post treatment within group and in between group

	Group MWM Mean $\pm$ SD	Group STM Mean $\pm$ SD	Mean Difference	P Value
Pre treatment	19.33 $\pm$ 2.12	18.53 $\pm$ 2.50	0.80	0.354
Post treatment	4.60 $\pm$ 0.82	5.66 $\pm$ 1.11	-1.06	0.006
Mean Difference	14.73	12.87		
P Value	0.00	0.00		

Specific activities are carry a grocery bag, turn a doorknob and key, lift a full coffee cup to your mouth, open a jar, pull up pants. Table show that p value is significant for both groups and within group at pretreatment and post treatment level. In between 2 groups p value is also significant i.e.  $p < 0.05$  and mean difference is greater after treatment session.

Table: 4 usual activities at baseline and post treatment within group and in between group

	Group MWM Mean $\pm$ SD	Group STM Mean $\pm$ SD	Mean Difference	P Value
Pre treatment	19.93 $\pm$ 1.53	18.33 $\pm$ 2.52	1.60	0.45
Post treatment	3.80 $\pm$ 1.08	5.73 $\pm$ 1.03	-1.93	0.00
Mean Difference	16.13	12.6		
P Value	0.00	0.00		

Usual activities included are personal activity (dressing, washing), house hold work (cleaning and maintenance), work (your job or everyday work recreational and sporting activities

.Group MWM has mean difference of 16.13 as its pre-treatment mean  $\pm$ SD was  $19.93 \pm 1.53$  and post treatment mean  $\pm$ SD was  $3.80 \pm 1.08$ . Group Soft Tissue Mobilization has mean difference of 12.6 as its pre-treatment mean  $\pm$ SD was  $18.33 \pm 2.52$  and post treatment mean  $\pm$ SD was  $5.73 \pm 1.03$  while P value is significant for both groups.

## DISCUSSION

The present study was conducted to see the effects of, MWM with STM in patients with lateral epicondylitis. The main results of present study were pain relief, improved grip strength and specific and usual activities. In this study the author include the Age group between 15-30 years. According to literature a study was conducted in which, mean age at which tennis elbow occur is in between 40 to 50 years<sup>14</sup>. In UK 2017, A research was done on orthopedic surgeons and physiotherapists to investigate which techniques are best for tennis elbow results were that approximately 81% recommended that therapeutic exercises as a first-line treatment option. (15) Stasinopoulos D et al. stated that Deep friction massage along with Mill's manipulation technique is very effective method for treatment of pain associated with tennis elbow. (16) But in current study Mobilization with movement has greater effect than the Soft Tissue Mobilization in relieving pain and improving grip strength and fictional status in patients with tennis elbow. Brosseau et al. said that DTF massage therapy for the managing the patients of tendinitis and author concluded that massage therapy is one of the main choice for treating patients of tendinitis. (17) Trishna Kakati et al said that that both Mulligan's technique MWM and elbow orthosis are very effective in pain management and improving the grip strength in patients of tennis elbow directly after treatment. (18, 19) But in current study Mobilization with movement showed best results in relieving pain and improving grip strength and in patients with tennis elbow. In Current study MWM was very effective to improve functional status in tennis elbow patients while a study done by Karthika Prasad et al in india in 2019, the Myofascial Release was more effective in improving grip strength and functional status in contrast to MWM<sup>20,21</sup>. In 2020, JH Lee et al a research findings revealed that taping techniques along with Deep Friction Massage are also an effective approach in tennis elbow for pain reduction, improvement of functions, and grip strength along with muscle activation in lateral epicondylitis<sup>22</sup>. In a previous reseach done by, Shamsoddini et al taping techniques was very effective to reduce pain in tennis elbow (23) and same results showed by Vicenzino et al. that diamond shape taping techniques was best pattern than other taping techniques. (24) Previous study done by Nagrale et al. Showed that steroid injections and deep friction massage reduce pain in patients of tennis elbow<sup>25</sup>. [Peterson et al.](#) conducted randomized trial to see the effects of eccentric exercises along with concentric exercises and he found that eccentric exercises showed more improvement of pain and muscle strength. (26) In current study Mobilization with movement has greater effect than the Soft Tissue Mobilization in relieving pain and improving grip strength and fictional status in patients with tennis elbow

## CONCLUSION

The present study concluded that Mobilization with movement has more effect than the Soft Tissue Mobilization in relieving pain and improving grip strength and fictional status in patients with tennis elbow.

## Recommendations

- Immediate and long term effect must be evaluated
- Sample size should be enhanced
- Study should be done other age group as well
- More studies should be conducted in treating different postural syndrome and musculoskeletal condition independently.

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