# Effectiveness Of Myofascial Release Versus Theraband Flex Bar Exercise In Tennis Elbow: Sports Players

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**BACKGROUND**: Tennis elbow is a condition in which the tendon that attaches the elbow joint to the forearm muscle becomes inflamed due to overuse or degenerative changes. The main symptoms of tennis elbow include pain and soreness on the outside of the elbow and weak grip strength. Myofascial Release is a safe and very effective hands-on technique that involves applying gentle sustained pressure into the Myofascial connective tissue restrictions to eliminate pain and restore motion. The Flex bar is made from dry, natural rubber and it is a foot long. They are available in different diameters that take more or less force to bend into a U shape. It has ridges to make it easier to grip. The eccentric exercises and the concentric exercises are done with the TheraBand Flex bar.

**AIM--**The aim of this study is to compare the Effect of myofascial release and TheraBand flex bar exercise verses TheraBand flex bar exercise in tennis elbow: Sports player.

**OBJECTIVES--**To relief pain by myofascial release on nonspecific tennis elbow. To improve the strength and functional abilities by TheraBand flex bar exercise on nonspecific tennis elbow.

**METHODOLOGY:**

- Source of data: Parul Sevashram Hospital.
- Study design: A comparative Study.
- Sample size: 30
- Sampling method: Simple Random Sampling using random number table sampling method
- Study duration:4 weeks

**Index Terms**: Myofascial Release, TheraBand Flex bar exercise

## 1 ANATOMY OF ELBOW

The elbow joint considered to be a compound joint that functions as a modified or loose hinge joint. One degree of freedom is possible at the elbow, permitting the motions of flexion and extension, which occur in the sagittal plane around a coronal axis. A slight bit of axial rotation and side-to-side motion of the ulna occurs during flexion and extension, and that is why the elbow is considered to be a modified or loose hinge joint rather than a pure hinge joint.2 Two major ligaments and five muscles are directly associated with the elbow joint. Three of the muscles are flexors that cross the anterior aspect of the joint. The other two muscles are extensors that cross the posterior aspect of the joint. The proximal and distal radioulnar joints are linked and function as one joint. The two joints acting together produce rotation of the forearm and have 1 degree of freedom of motion. The radioulnar joints are arthrodial uniaxial joints of the pivot (trochoid) type and permit rotation (supination and pronation), which occurs in the transverse plane around a longitudinal axis. Six ligaments and four muscles are associated with these joints. Two muscles are for supination, and two are for pronation. The elbow joint and the proximal radioulnar joint are enclosed in a single joint capsule but constitutes distinct articulations. [1]

### 1.1 Tennis elbow:

Tennis elbow, or lateral epicondylitis, is a painful condition of the elbow caused by overuse. Not surprisingly, playing tennis or other racquet sports can cause this condition. However, several other sports and activities can also put you at risk. Tennis elbow is an inflammation of the tendons that join the forearm muscles on the outside of the elbow. The forearm muscles and tendons become damaged from overuse — repeating the same motions again and again. This leads to pain and tenderness on the outside of the elbow. [2] Although an exact cause on how lateral epicondylitis develops has yet to be determined, it is generally agreed that the overuse of wrist and hand functions contributes to the complaint of pain. Tissue-based pathology seen in cases of lateral epicondylitis includes degenerative changes at the proximal common extensor origin. In addition, myofascial trigger points in the muscles attached to the lateral epicondyle may also be a source of pain. [3] Epicondylitis or tennis elbow is actually a “tendinopathy” of varying degrees of severity which may include early insertional tears and degenerative changes within the tendon attachment to bone or may represent larger tears and other degenerative changes within the tendon commonly associated with overuse of forearm extensor muscles. Typically, a muscle colored in green in the picture to the left called the extensor carpi radialis brevis is one of the more common tendons affected and therefore is often associated with classic epicondylitis. The condition may also be seen in conjunction with radial collateral ligament instability and pathology that may also need to be addressed if treatment is going to be successful. The thing that makes this more complex is that first there are several tendons in addition to the Extensor carpi radialis brevis tendon that can be involved. [4] Lateral epicondylitis, commonly referred to as tennis elbow, affects 1% to 3% of the population. It is thought to be an overuse injury, originating in the wrist extensor muscles, rather than an inflammatory problem. It is brought on by occupational activities and sports that involve a repetitive wrist motion or a power grip the condition is most commonly associated with work related activity, such as cutting meat, plumbing, and working on cars, rather than with playing tennis. [5] Lateral Epicondylitis is most commonly an idiopathic or a work-related condition. It results in restricted function and it is one of the costliest of all work-related illness. The peak prevalence of it is in the fourth decade of life when it is four

times more common than any it is most prevalent (35-64%) in jobs requiring repetitive manual tasks. It results in restricted function and it is one of the most-costly of all work-related illness. [6] Tennis elbow causes pain on the outer side of your elbow. The medical term for tennis elbow has traditionally been 'lateral epicondylitis'. This is because the pain is felt around the area of the lateral epicondyle (the lower, outer, bumpy part of your homers bone in your upper arm). The 'it is' means inflammation. However, it is now thought that tennis elbow does not involve inflammation, so this term is being used less. The site of the pain in tennis elbow is where some tendons from your forearm muscles attach to the bone around elbow. The pain is thought to be caused by swelling or thickening of the tendon, and eventually degeneration. This damage is usually caused by overuse of forearm muscles in repeated actions such as wringing clothes or manual work (particularly with twisting movements such as using a screwdriver). Playing tennis or other racquet sports can also cause tendon injuries. However, despite being called tennis elbow, racquet sports are only thought to be the cause in about 5 in 100 cases. In most people, tennis elbow affects the arm that you write with dominant hand. [7]

## 2 MYOFASCIAL RELEASE

Myofascial release is the application of a low load, long duration stretches to the myofascial complex, intended to restore optimal length, decrease pain, and improve function. It has been hypothesized that fascial restrictions in one part of the body cause undue tension in other parts of the body due to fascial continuity. Myofascial practitioners believe that by restoring the length and health of restricted connective tissue, pressure can be relieved on pain sensitive structures such as nerves and blood vessels. Myofascial release generally involves slow, sustained pressure(120-300s) applied to restricted fascial layers either directly (direct technique MFR) or indirectly. [8] Myofascial release is a collection of techniques used for the purpose of relieving soft tissue from an abnormal hold of a tight fascia. Fascia is located between the skin and the underlying structure of muscle and bone, it is a seamless web of connective tissue that covers and connects the muscles, organs, and skeletal structures in our body Muscle and fascia are united forming the myofascial system. [9] Myofascial release is commonly applied to athletes during periods of fatigue in training. Fatigue is associated with muscular beer changes that reflect the increased effort required to maintain a given level of mechanical performance. The relaxation that massage therapy is able to produce has proved capable of reducing local fatigue and the muscular excitability by inducing relaxation. Thus, massage reduces the feeling of fatigue that may give the perception that participants can work out longer and harder. [10]

### 2.1 TheraBand flex bar:

The Flex-bar is made from dry, natural rubber and it is a foot long. They are available indifferent diameters that take more or less force to bend into a U shape. It has ridges to make it easier to grip. A new treatment for tennis elbow uses a strengthening tool called the TheraBand Flex-Bar to relieve tennis elbow pain. Traditional treatment of tennis elbow pain has focused on avoiding most activities of the elbow and forearm in an effort to avoid "overuse" of the tendons that are irritated in tennis elbow. TheraBand Flex-Bar to perform strengthening exercises of the forearm. These exercises are specifically designed to perform eccentric strengthening manoeuvres — a technique that has been successful in patients with Achilles tendonitis pain. [11]The isolated eccentric strengthening exercise was performed using a TheraBand flex-bar; which was twisted using wrist flexion of the uninvolved limb and slowly allowed to untwist with eccentric wrist extension by the involved limb. [12]The TheraBand flex-bar exercise is a flexible bar of natural rubber that provides resistance for upper body exercise, mobilization, oscillation activities. Four progressive resistance are available: yellow, red, green and blue.

### 2.2 Material used:

(1) Pen (2) Pencil (3) Rubber (4) Data Collection Sheer (5) Petroleum gel (6) Stool (7) Measure Tap (8) Theraband Flex bar (9) Hand Dynamometer

### 2.3 Outcome measures:

(1) Numerical pain rating scale
(2) Patient related tennis elbow evaluation
(3) Hand dynamometer: for grip strength

Mill's test:
It is the test used to diagnosed the lateral epicondylitis. The examiner palpates the patient's lateral epicondyle with his/her thumb while passively pronating the forearm, flexing the wrist and extending the elbow. Result: A positive test would be the reproduction of pain near the lateral epicondyle.

(Figure: 2.1)

(Figure: 2.2)

### 2.4 Cozen test:

It is the test used to diagnosed the lateral epicondylitis.

**Procedure:**
The examiner stabilizes the patient's elbow with his/her thumb while palpating the lateral epicondyle. The patient is then asked to actively make a fist, pronate his or her forearm as well as radially deviate and extend the wrist against a counter force that is being applied by the examiner. Result: A positive test would be the reproduction of pain near the lateral epicondyle

(Figure: 2.3)

## 3. PROCEDURE:

The study sample consists of 30 subjects having a tennis elbow. The subject in the study were include based on the inclusion and exclusion criteria, after the demographic data other relevant information were obtained from the subjects along with informed and consent.The studies were conducted with the prior permission of the hospital and people themselves, and after approval of the permission, the study was conducted in the allotted time. Detail instruction of the study regarding the benefits, aim, objective, dangers and purpose of the study was be explained to them clearly. After selecting through inclusion and exclusion criteria, subject will be assessed one by one.

### 3.1 Procedure of myofascial release:

Myofascial release was performed for 30 minutes. The intervention period was 3 days/week. Study duration was 4 weeks. There were 5 techniques of massage should be used. There were techniques named are effleurage, kneading, Percussion, Friction, Vibration. After every technique's effleurage was given for 1 minutes.

| Techniques | Description |
|---|---|
| Effleurage | Starting position:<br>Elbow should be 90*flexed. In resting position forearm pronation and arm abducted.<br>Duration: 4 minutes<br>Procedure:<br>Linear movement of hand, along the entire fascia, with<br>moderate pressure and constant touch. |
| Kneading | Starting position:<br>Elbow should be 90* flexed. In resting position forearm pronation and arm abducted.<br>Duration: 4 minutes<br>Procedure:<br>Circular movement of soft tissue, parallel to the long axis<br>of underlying bone, with constant touch and intermittent pressure. |
| Percussion (Hacking) | Starting position:<br>Elbow should be 90* flexed. In resting position forearm pronation and arm abducted.<br>Duration: 4 minutes<br>Procedure:<br>Oscillatory movement of hand with intermittent touch and<br>pressure. Ulnar border of the 5th, 4th, 3rd digits of hand. |
| Friction | Starting position:<br>Elbow should be 90* flexed. In resting position forearm pronation and arm abducted.<br>Duration: 4 minutes<br>Procedure:<br>Small range to and for movement of soft tissue with<br>constant touch and constant deep pressure. |
| Vibration | Starting position:<br>Elbow should be 90* flexed. In resting position forearm pronation and arm abducted.<br>Duration: 4 minutes<br>Procedure:<br>Small range oscillatory movement of hand in upward<br>downward direction with constant touch. |

### 3.2 Procedure of Thera-band flex-bar exercise:

TheraBand flex bar exercise was performed for 15 minutes. The exercises were performed for 3 times a day for 15 minutes that's why the total time of exercises were 45 minutes. The exercise protocol was given for 4 times a week for 4 weeks. The exercises which were included as below: Wrist flexion, Wrist extension, Forearm supination, Forearm pronation, Elbow flexion, Elbow extension. In exercise protocol there was eccentric contraction of extensor carpi radialis brevis muscle.

| Exercise | Description |
|---|---|
| Wrist Flexion | Starting position:<br>Patient is in sitting position. Elbows of both the hand is approximately 900 flexed. Hold the TheraBand<br>flex bar in midline position.<br>Repetitions:<br>Two sets of 15 repetitions<br>Procedure:<br>Twist the flex bar from top and bottom. So, wrist flexion<br>movement was done. |
| Wrist Extension | Starting position:<br>Patient is in sitting position. Elbow of affected hand is in 900 flexion.<br>Repetitions:<br>Two sets of 15 repetitions.<br>Procedure:<br>Hold the flex bar in the hand of the affected<br>elbow. Extend or bend the wrist back ward. |
| Forearm Supination | Starting position:<br>Patient is in sitting position. Forearm is in resting position.<br>Duration:<br>Two sets of 15 repetitions.<br>Procedure:<br>Grasp one end of TheraBand flex bar with hand of affected elbow. Bend the flex bar in direction of supination. This sexercise will strengthen the muscles of forearm and wrist. |
| Forearm Pronation | Starting position:<br>Patient is in sitting position. Forearm is in resting position.<br>Duration:<br>Two sets of 15 repetitions.<br>Procedure:<br>Grasp one end of TheraBand flex bar with hand of affected elbow Bend the flex bar in direction of pronation. This exercise will strengthen the muscles of<br>forearm and wrist. |
| Elbow Flexion/ Extension: | Starting Position:<br>Patient is in sitting position. Elbow of the affected hand is approximately 900 flexed.<br>Duration:<br>Grasp the lower end of the flex bar in front of body with the affected hand.<br>Grasp the upper end of the flex bar away with other hand facing away from body.<br>Twist the bar with the top hand as stabilize with bottom hand.<br>Hold both wrist steady as extend both elbows in front of body.<br>The wrist of the injured side should be extended and the other wrist is flexed.<br>Slowly release the bar with the injured side while maintaining tension with the uninjured side. So, the action of elbow extension should be<br>done. |

## 4 STATISTICAL ANALYSIS

### (1) Statistical methods

Descriptive statistical analysis has been carried out in this present study. Outcome measurements are measured

using myofascial release and TheraBand flex bar and presented as mean SD. significance is assessed at 0% level of significance p<0.0000.

**(2) Statistical test**

Z test and paired 't' test used for analysis of Tennis elbow within GROUP A and GROUP B with calculation of values obtained as data during study.

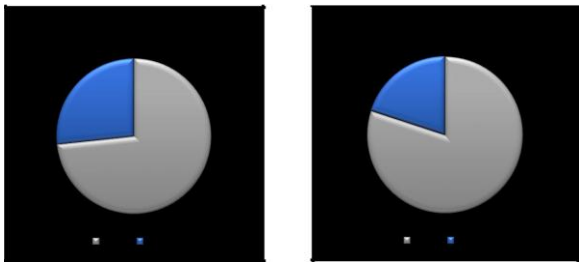
**(3) Statistical software**

The statistical software namely MED CALC were used for analysis of data and Microsoft word and excel have been used to generate graphs, tables, etc.

*Tabular and Graphical Presentation*

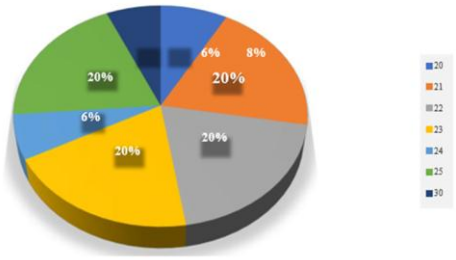
| Group | Male | Female |
|---|---|---|
| Group A | 11 | 4 |
| Group B | 12 | 3 |

***Table 1:*** *gender distribution in group A & B*

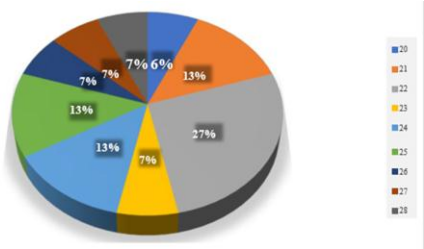


***Graph 1:*** *Gender distribution of group A & B*

Age group distribution




***Graph 1:*** *Age distribution in group A*




***Graph 2:*** *Age distribution in group B*

## 5 RESULT

The maximum mean for Group A (myofascial release) which include effleurage, kneading, vibration, percussion, friction, for 3 min were given each 1 min rest period recorded during MFR. NPRS, PRTEE & HAND DYNAMOMETER were used to assess tennis elbow the mean value of that were (7.40), (113.80), (53.26) respectively. After the therapy mean value that were (3.46), (77.40), (67.93) respectively. The maximum mean for Group B (TheraBand flex bar) which include wrist flexion, extension, wrist supination & pronation, Elbow flexion & extension for 3 min are given with 1 min rest period recorded during TheraBand flex bar exercise. NPRS, PRTEE & HAND DYNAMOMETER were used to assess tennis elbow the mean value of that were (7.53), (106.46), (63.26) respectively. After the therapy mean value that were (3.26), (52.00), (97.60) respectively. So, result of the therapy showed that there was significant improvement in strength and reduced the pain in tennis elbow in sports player where Group B showed significant better result than that of Group A showed the t (10.11) is significant and alternative hypothesis is proved.

## 6 DISCUSSION

In this study the effect of myofascial release versus TheraBand flex bar exercise on tennis elbow in sports players. In this study we taken subjects of 30 sports players between age of 20 to 35 years was taken for the study. The subjects who met the inclusion criteria was included in the study. An inform and return consent form was take from sports player and divide 15 into each group by using chit method and post intervention assessment was done with NPRS, PRTEE, & HAND DYNAMOMETER. Group A (myofascial release) Group B (TheraBand flex bar exercise). Finding of the study shows significant difference in tennis elbow with TheraBand flex bar exercise and myofascial release. Therefore, 4 weeks myofascial release and TheraBand flex bar exercise were reduced pain and improve strength in tennis elbow patients. but the course of study shows that TheraBand flex bar exercise was more effective than myofascial release. Tennis elbow, or lateral epicondylitis, is a painful condition of the elbow caused by overuse. Tennis elbow is an inflammation of the tendons that join the forearm muscles on the outside of the elbow. The forearm muscles and tendons become damaged from overuse repeating the same motions again and again. This leads to pain and tenderness on the outside of the elbow. Although an exact cause on how lateral epicondylitis develops has yet to be determined, it is generally agreed that the overuse of wrist and hand functions contributes to the complaint of pain. Tissue-based pathology seen in cases of lateral epicondylitis includes degenerative changes at the proximal common extensor origin. The peak prevalence of it is in the fourth decade of life when it is four times more common than any it is most prevalent (35-64%) in jobs requiring repetitive manual tasks. Myofascial release is the application of a low load, long duration stretches to the myofascial complex, intended to restore optimal length, decrease pain, and improve function. It has been hypothesized that fascial restrictions in one part of the body cause undue tension in other parts of the body due to fascial continuity. Myofascial release generally involves slow, sustained pressure(120-300s) applied to restricted fascial layers either directly (direct technique MFR) or indirectly. Myofascial release is commonly applied to athletes during periods of fatigue in training. The Flex-bar is made from dry, natural rubber and it is a foot long. They are available indifferent diameters that take more or less force

to bend into a U shape. It has ridges to make it easier to grip. The TheraBand flex-bar exercise is a flexible bar of natural rubber that provides resistance for upper body exercise, mobilization, oscillation activities. Four progressive resistance are available: yellow, red, green and blue. Z test and paired 't' test used for analysis of Tennis elbow within GROUP A and GROUP B with calculation of values obtained as data during study. The statistical software namely ME CALC were used for analysis of data and Microsoft word and excel have been used to generate graphs, tables, etc. The maximum mean for Group A (myofascial release) which include effleurage, kneading, vibration, percussion, friction, for 3 min were given each 1 min rest period recorded during MFR. NPRS, PRTEE & HAND DYNAMOMETER were used to assess tennis elbow the mean value of that were (7.40), (113.80), (53.26) respectively. After the therapy mean value that were (3.46), (77.40), (67.93) respectively. The maximum mean for Group B (TheraBand flex bar) which include wrist flexion, extension, wrist supination & pronation, Elbow flexion & extension for 3 min are given with 1 min rest period recorded during TheraBand flex bar exercise. NPRS, PRTEE & HAND DYNAMOMETER were used to assess tennis elbow the mean value of that were (7.53), (106.46), (63.26) respectively. After the therapy mean value that were (3.26), (52.00), (97.60) respectively. So, result of the therapy showed that there was significant improvement in strength and reduced the pain in tennis elbow in sports player where Group B showed significant better result than that of Group A showed the t (10.11) is significant and alternative hypothesis is proved.

## CONCLUSION

The result of the present study suggests that myofascial release and TheraBand flex bar exercise both are effective in reduced pain and improve strength in tennis elbow in sports players. But significant and noticeable improvement is seen in Players who performed flex bar exercises for 4 weeks. This study provided evidence to support the TheraBand flex bar exercise is useful to improve strength in sports players.

## SUMMARY

The main aim for this study is to compare the effectiveness of myofascial release and TheraBand flex bar exercise for reduced pain and improve strength in tennis elbow in sports players. They were during myofascial release and TheraBand flex bar exercise for 4 days/week up to 4 weeks. NPRS, PRTEE and Hand Dynamometer was used to measure tennis elbow in sports players. Value of this outcome measure were taken at base line and after 4 weeks of exercise program. Paired t test and z test used to compare the outcome measure in both groups. After the exercise the result shown the significant improvement in both the outcome measure in group A and group B. TheraBand flex bar is more effective than myofascial release. So, result of the therapy showed that there was significant improvement in strength and reduced the pain in tennis elbow in sports player where Group B showed significant better result than that of Group A showed the t (10.11) is significant and alternative hypothesis is proved.

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